

R E P O R T

OF THE

SUBMARINE ELECTRIC TELEGRAPH COMMITTEE ;

TOGETHER WITH

MINUTES OF PROCEEDINGS AND EVIDENCE.

REPORT BROUGHT UP 21ST OCTOBER, 1872, AND ORDERED TO BE PRINTED.

WELLINGTON.

—
1872.

ORDERS OF REFERENCE.

Extracts from the Journals of the House of Representatives.

THURSDAY, THE 25TH DAY OF JULY, 1872.

Ordered, That a Select Committee be appointed to inquire into the subject of connecting New Zealand by Submarine Electric Cable with other countries, and to report thereon. The said Committee to consist of the Hon. Mr. Vogel, the Hon. Mr. Ormond, the Hon. Mr. Fitzherbert, Mr. Macandrew, Mr. J. Shephard, Mr. Creighton, Mr. E. Richardson, Mr. Tribe, and the Mover, with power to call for persons and papers ; three to be a quorum ; and the Report to be brought up within a month.

WEDNESDAY, THE 18TH DAY OF SEPTEMBER, 1872.

Ordered That the Sub-marine Cable Committee have leave to postpone the bringing up their Report for fourteen days.

SUBMARINE ELECTRIC TELEGRAPH COMMITTEE'S REPORT.

INTERIM REPORT.

THE Committee to whom was referred the question of Submarine Electric Communication between New Zealand and Australia, have the honor to report that they have taken certain evidence which they have the honor to present to the House.

24th September, 1872.

CHARLES O'NEILL,
Chairman.

REPORT.

THE Committee to whom was referred the consideration of the subject of connecting New Zealand by Submarine Electric Cable with other countries, have the honor to report that they have taken evidence and obtained information on the subject.

From the evidence and papers appended, the Committee are of opinion that no company will be found at present willing to lay a Submarine Cable between New Zealand and Australia in terms of "The New Zealand and Australian Submarine Telegraph Act, 1870."

The Committee, while recognizing the importance of telegraphic communication with Australia to the commercial and mercantile interests of New Zealand, are not prepared to recommend, under existing circumstances, that the proposals of Mr. Audley Coote or Siemen Brothers (as per letters attached) should be entertained; but they are of opinion that the Government should make further inquiries on this subject during the recess, with the view of ascertaining on what terms and to what extent the Australian Government would be willing to aid New Zealand in laying a Submarine Telegraph Cable to connect the Australian mainland with this Colony, for the information of Parliament next Session.

21st October, 1872.

CHARLES O'NEILL,
Chairman.

MINUTES OF PROCEEDINGS.

SATURDAY, 20TH JULY, 1872.

Committee met pursuant to notice.

PRESENT :

Mr. Creighton,
Mr. O'Neill,

Mr. J. Shephard,
Mr. Tribe.

Order of reference read.

On the motion of Mr. Creighton, Mr. O'Neill was appointed Chairman.

On the motion of Mr. Creighton, *Resolved*, That the Chairman be requested to procure all papers in reference to the Submarine Electric Cable.

Committee then adjourned.

WEDNESDAY, 7TH AUGUST, 1872.

Committee met pursuant to adjournment.

PRESENT :

Mr. Creighton,

Mr. J. Shephard.

Mr. O'Neill, Chairman.

Minutes of the previous meeting read and confirmed.

On the motion of Mr. Creighton, *Resolved*, That Mr. Lemon and Mr. Floyd be requested to attend at the Committee Room on Friday next, at 12 o'clock, to give evidence.

Committee then adjourned until Friday, at 12 o'clock.

FRIDAY, 9TH AUGUST, 1872.

Committee met pursuant to adjournment.

PRESENT:

Mr. E. Richardson,	Mr. Tribe.
Mr. J. Shephard,	
Mr. O'Neill, Chairman.	

Minutes of previous meeting read and confirmed.

Evidence of Mr. Lemon taken.

Mr. Lemon was thanked for his attendance, and the witnesses were requested to attend again on Wednesday.

Committee then adjourned until Wednesday next, at 12 noon.

FRIDAY, 16TH AUGUST, 1872.

Committee met pursuant to adjournment.

PRESENT:

Mr. Creighton,	Mr. J. Shephard,
Mr. E. Richardson,	Mr. Tribe.
Mr. O'Neill, Chairman.	

Minutes of last meeting read and confirmed.

Mr. Lemon further examined, and presented to the Committee a paper on Submarine Cable.

Mr. W. H. Floyd examined, and read papers to the Committee relative to a Submarine Cable between New Zealand and Australia.

On the motion of Mr. Creighton, *Resolved*, That Captain Johnson and Captain Edwin be requested to attend the Committee for the purpose of giving evidence in reference to the Submarine Cable, and to bring any maps relating thereto.

Committee then adjourned.

MONDAY, 21ST OCTOBER, 1872.

Committee met pursuant to notice.

PRESENT:

Mr. Creighton,	Mr. E. Richardson,
Hon. Mr. Ormond,	Mr. Tribe.
Mr. O'Neill, Chairman.	

Minutes of the previous meeting read and confirmed.

The Committee deliberated; when it was *Resolved*, That the Chairman be requested to prepare a report in terms of the notes laid before the Committee.

Committee adjourned.

MINUTES OF EVIDENCE.

THURSDAY, 15TH AUGUST, 1872.

Mr. C. LEMON in attendance, and examined.

Mr. C. Lemon.

15th Aug., 1872.

1. *The Chairman.*] You are General Manager of Telegraphs?—Yes.
2. Have you directed your attention to submarine cables?—The first time we had anything to do with it was with regard to the points at which the cable should be landed. The late Mr. Balfour and myself agreed that our end of the cable would suit the requirements of the Colony best if landed at Cape Farewell, on two grounds, namely:—1st. So far as the cable was concerned, there would be less chance of injury, owing to the bottom of the sea being of a sandy formation. 2nd. That it would strike the centre of our Telegraph system.
3. What is the distance from Sydney?—From 1,160 to 1,170 nautical miles, or 1,343 to 1,355 statute miles.
4. In answer to questions, witness said, when asked about the desirability of laying a cable through Foveaux Strait to Tasmania, it was not desirable, owing to the rapidity of the current through the Strait, and also that the New Zealand cable would, in case the Tasmanian broke down, be next to useless. And another cogent reason was, that an additional tariff on messages would have to be added, through our messages having to pass through the Tasmanian cable. I consider that if we are to have a cable at all, it should join Australia direct. The exact points of connection could only be determined after soundings had been made. Taking the Gutta Percha Company's samples and prices, which have been sent, the cost would range from £183,000 to £465,000. That is for a cable ready for shipment. To that the cost of freight and laying expenses would have to be added. The difference in price depends on the quality of the cable, and that, to a certain extent, depends on the nature of the ground. The £465,000 cable is a very superior article—superior to any of the others. It is stronger,

and its buoyancy is greater, and the thickness of gutta percha is in excess of the others. It is something like the Atlantic cable.

5. Do you think any company would undertake the laying of a cable?—No company would entertain such a proposition previous to taking soundings. I have here an offer from the Submarine Telegraph Company to lay a cable for £350,000, but they do not say what class of cable would be used. Till that is fixed, it is impossible to estimate the cost of bringing out and laying it here.

6. Could the cable be lifted in the event of accident?—Yes; provided it was of a certain class. Some are not strong enough to lift beyond a certain depth. I have here a letter from a Mr. Donovan which gives the cost by the different proposed routes.

7. Do you think the cable should be laid by the Colony, or should it be left to private enterprise?—I think, taking all things into consideration, that it would be better, although it might cost a little more, for a private company to undertake the thing. They have all the necessary appliances in England, and we would require to commence by getting all that would be wanted.

8. On what terms would you give it to a private company to work?—That would be a matter for arrangement between the two Governments. So far as the New Zealand Government is concerned, I think that the conditions stated are fair and proper.

9. Have you any idea of the probable revenue. Would it pay sufficient interest on the outlay?—The Hon. Mr. Vogel asked me to give him the probable revenue from a cable between here and Australia. Of course there is no reliable data to go upon, and the only plan is to take the amount of correspondence between the two countries, and compare that with the correspondence in New Zealand as against the telegrams here. [Witness pointed out that, while the telegrams were increasing, the letters were going back. All letters, except English or foreign, were included in this statement.]

Memorandum for the Chairman of the Submarine Electric Cable Committee.

From the 13th March, 1872, to the 12th April, 1872, the number of telegrams sent from the Province of Auckland to other parts of the Colony, and *vice versa*, when communication between the North and South Telegraph Stations was completed by horse express, was 961, value £90 8s. 6d.

When the wires were joined up, thus doing away with the horse express, the increased facilities for telegraphing raised the number to 2,561 telegrams, value £226 18s. 6d., in one month.

The number of telegrams posted in one month (July, 1872) for Australia is 214. Assuming we receive as many, posted in Australia, to be telegraphed on arrival in New Zealand, when the cable is laid the increased facility for telegraphing would cause 1140·5 telegrams to be sent monthly to and from New Zealand, being an average of 36·7 messages daily for a month of 31 days.

C. LEMON,
General Manager.

New Zealand Telegraph Head Office,
Wellington, 13th August, 1872.

10. Do you think the revenue that might be made from a cable would be sufficient to pay a fair interest to the contractor?—No; I think it would fall very far short of it; but then the cable, though it might not pay directly, might pay in other ways, though its value in that way might be difficult to estimate.

11. Would a contractor lay down a cable without a guarantee?—No, I do not think so.

12. Supposing it was left open to the world, that we said to the various companies, "Here, lay down a cable if you like, and we will give you a concession or monopoly of it for twenty-one years." Do you think contractors would take it up?—No, I do not think so.

13. Has the Cook Strait Cable cost anything for maintenance?—Nothing since it was laid.

14. Has the telegraph business increased in New Zealand?—Yes; but the increase has been owing to the increased facility for communication. When the last computation was made fares were much higher, which proves that people instead of writing letters are telegraphing more.

FRIDAY, 16TH AUGUST, 1872.

Mr. C. LEMON in attendance, and further examined.

Mr. C. Lemon.

15. *The Chairman.*] Between the 13th March, 1872, and the 12th April, 1872, the number of telegrams sent from the Province of Auckland to other parts of the Colony, and *vice versa*, when communication between the North and South telegraph stations was completed by horse express, was 961, of the value of £90 8s. 6d. When the wires were joined up, thus doing away with the horse express, the increased facilities for telegraphing raised the number to 2,561 telegrams, of the value of £226 18s. 6d. in one month. The number of telegrams posted in one month (July, 1872) for Australia is 214. Assuming we receive as many posted in Australia to be telegraphed on arrival in New Zealand, when the cable is laid, the increased facilities for telegraphing would cause 1140·5 to be sent monthly to and from New Zealand, being an average of 36·7 messages daily for a month of 31 days.

16th Aug., 1872.

16. In reply to further questions put by the Chairman, the witness stated that in his previous evidence he had answered the question, Would you recommend that the laying of the cable should be undertaken by the Government or a private company? He had expressed his opinion in favour of the latter.

17. In the report of the Electric Telegraph Committee of 1870 it is stated that 6 per cent. guarantee is the amount such a company would require. Do you consider that that would be a reasonable amount?—A late report on the subject, dated 5th February, 1872, recommends that the guarantee should be 5 to 6 per cent. My opinion is, that the guarantee should be given by the joint Governments.

18. Have you any other suggestions to make in the matter—anything about the best route?—No; the first thing that would require to be done would be to take proper soundings.

19. In reply to Mr. Creighton, the witness said—That, so far as his recollection served him, the soundings taken between the Australian and New Zealand coasts showed a depth of 1,400 fathoms in some parts. It did not, however, matter so much about the depth; the main question they would have to consider was about the bottom. The witness quoted from a report by the late Mr. James M. Balfour to the General Manager of the New Zealand Telegraph Department, dated 21st October, 1869, in which it was stated—"It is impossible to estimate the amount of slack which would be required, or even to compare the several routes in a satisfactory manner, in the absence of soundings. The Admiralty Chart shows absolutely no soundings on any of the routes outside of the usual coastal soundings."

Mr. W. H. FLOYD in attendance, and examined.

Mr. W. H. Floyd.

16th Aug., 1872.

20. *The Chairman.*] In reply to questions put, witness said—I hold the position of Electrician to the Government of New Zealand.

21. Are you acquainted with deep-sea cables?—I have studied the electrical conditions to be observed in the construction of deep-sea cables. I have prepared the following notes on the subject, containing information that may be useful to the Committee.

The annexed notes were then put in and read by the witness:—

Memorandum.

Assuming that an electric cable for connecting New Zealand with Australia would be laid from Cape Farewell to Sydney, and that the distance between those points is about 1,160 or 1,170 nautical miles, as stated by Messrs. Balfour and Lemon, it would be necessary to provide 1,400 nautical miles of electric cable, the extra 20 per cent. over the estimated distance from point to point being only a reasonable and usual allowance for slack and contingencies. The two Atlantic cables laid from Valentia to Newfoundland pass over a course said to be 1,670 miles long. The length of cable is in one case 1,866, and in the other 1,852 nautical miles, or 13·5 and 10·9 per cent. respectively, in excess of the distance from land to land.

Should a cable from New Zealand to Australia be as successfully laid as the Atlantic cables were, and with a similar proportion of waste, the balance of the 20 per cent. I judge to be necessary for slack and contingencies would not be too much spare stock to be kept as a provision in case of accident to the cable.

The core adopted for the Atlantic cables was determined on after careful study, much experience, and many failures. It has proved eminently suitable for the length of line intended to be worked through it, and may be safely adopted as a standard for calculating the electrical requirements of a cable from New Zealand to Australia.

The copper strand composing the conductor weighs 300 lbs. to the nautical mile; and taking 100 as the specific conductivity of pure copper, the conductivity of the copper in the Atlantic cable of 1866 is 94·63. Insulation is obtained by four layers of gutta percha and four layers of Chatterton's Compound, laid alternately around the conductor. The weight of the insulation is 400 lbs. per nautical mile. The electrical length of the cable of 1866 is 4·20 British Association units per nautical mile, or 7778·4 units in the 1,852 nautical miles of cable.

As the electrical length of a conducting wire is inversely proportional to its weight per mile, and the distance to be worked through between New Zealand and Australia would probably be only 1,300 nautical miles, the conductor of the New Zealand cable, with the same percentage of conductivity, need only weigh 211 lbs. per nautical mile to be electrically equal to the Atlantic cable of 1866; and as this decrease in the weight, and consequently in the diameter of the conductor, would allow of a corresponding diminution in the thickness of the insulation, the insulating material of the New Zealand cable need only weigh 281 lbs. to the nautical mile.

The kind of armour most suitable for the cable would depend greatly upon the depth of water it had to be laid in, and the nature of the bottom on which it would rest, and cannot be positively determined without a knowledge of those conditions. Should they prove to be similar to the conditions met with between Ireland and America, there can be no doubt that the pattern of armour should be that of the Atlantic cables. This pattern was selected for deep-sea telegraph lines after many others had failed. Its adoption was the result of experience gained in numerous costly attempts and in repeated disappointments. It has proved thoroughly efficient. It was first employed in 1865; and when the French Atlantic cable was laid in 1869, it was still considered a pattern of armour that could not be improved upon for telegraph cables to be laid in deep seas. It is composed of ten homogeneous iron wires, each wire separately covered with Manilla hemp, and the whole laid spirally on a padding of jute that surrounds the core.

The iron wires are each $\frac{11}{16}$ of an inch in diameter. In the cable of 1865 the Manilla hemp surrounding them was tarred. In that of 1866 the tar was not used, but the cable of 1869 was treated exactly as that of 1865.

The weight of the cable of 1865 was $35\frac{3}{4}$ cwts. per nautical mile in air, 14 cwts. per nautical mile in water; its breaking strain, a little over 7 tons. The weight of a similar cable from New Zealand to Australia would be about 34 cwts. per nautical mile in air.

With reference to the nature of the bottom of the sea where a telegraph cable is to be laid, telegraph engineers and others engaged in cable-laying have frequently spoken in the Institute of Civil Engineers and elsewhere of difficulties arising from absence of survey, or from inaccuracy of surveys. It has been said that soundings shown on the charts published are not to be relied on for depths exceeding six to seven fathoms. No blame attaches to any one for this, as detailed and exact information respecting the bottom of the sea was not thought to be of great importance until submarine telegraph cable-laying commenced. Amongst other instances, I may mention that Mr. Varley and Captain Kelk, when engaged trying to lift the Atlantic cable of 1858, found it was laid upon a reef of rocks in Trinity Bay, Newfoundland, fifteen fathoms below the surface, and where the chart indicated a depth of fifty fathoms.

The plan of covering the outer armour of submarine telegraph cables with hemp served with tar or a tarry compound originated with Sir Charles Bright and Mr. Latimer Clarke, and was designed in consequence of experience having shown that where a submarine cable became buried in sand or mud, the sheathing remained intact; but where it was exposed, the iron armour was entirely destroyed in many places. It is supposed this destruction resulted from veins of copper at the bottom of the sea, from sulphuret of copper or iodine held in solution, or from black sulphuret of iron, arising from the decomposition of animal matter. Any of these being electro-negative to the iron sheathing, a battery couple would be set up, and the electro-positive sheathing rapidly disappeared. The hemp and tar are to protect exposed pieces of the cable, as the mud and sand would protect those portions covered by them.

If it should be decided to adopt the Atlantic model for a submarine telegraph cable for the deep-sea portion of the line between New Zealand and Australia, lengths of much heavier cable would be required at the landing places; the difference would however only extend to the armour, the core would be the same throughout. The length and weight of the shore ends can only be determined after survey.

As to the cost of a submarine electric cable of the pattern I have described, I am not able to speak with any assurance of accuracy at this distance from the home markets.

I have, &c.,

W. H. FLOYD,
Electrician, N.Z. Telegraphs.

15th August, 1872.

22. *The Chairman.*] You think that it is very necessary to have accurate soundings taken?—In order to put down a line with any degree of safety, previous soundings are indispensable.

23. After a cable has been well laid down, is it liable to go wrong?—The first cable successfully laid at any great depth was in the year 1865, so that sufficient time has scarcely elapsed to form an accurate opinion on the point.

24. In the event of going wrong, can it be easily picked up?—So long as the iron armour or outer protection remains intact, there is no great difficulty.

APPENDIX.

1.

Mr. W. GRAY to the CHAIRMAN, Telegraph Cable Company.

SIR,—

General Post Office, Wellington, August 17, 1872.

I have the honor, by direction of the Hon. the Postmaster-General, to forward to you the enclosed copy of a letter just received by him from Mr. Audley Coote on the subject of a Submarine Telegraph Cable to connect New Zealand with Australia.

I have, &c.,

W. GRAY,
(*pro* Secretary).

The Chairman, Telegraph Cable Committee.

Mr. AUDLEY COOTE to the HON. the POSTMASTER-GENERAL.

SIR,—

Hobart Town, Tasmania, 30th June, 1872.

I have the honor of again addressing you on the subject of the Submarine Telegraph Cable to connect New Zealand with Australia.

I have now, on behalf of the projectors of the Australia and New Zealand Telegraph Company, Limited, to submit for the approval of your Government the following terms for the construction and laying of the proposed cable:—

I am prepared to undertake, on behalf of the projectors of the Australian and New Zealand Telegraph Company, to construct, lay down, and maintain a Submarine Telegraph Cable to connect New Zealand with Australia, upon being guaranteed by the Government interest at the rate of $5\frac{1}{2}$ per cent. per annum on the sum of £450,000 for a term of fifty years.

A contract has been entered into with the India Rubber, Gutta Percha, and Telegraph Works Company to make and lay the cable.

With regard to the Directors of the Company it is almost needless for me to refer to their position, they are so well known in the commercial and telegraph world, namely, Charles Trotter, Esq., John W. McLaren, Esq., Abrm. Scott, Esq., James Alexander, Esq., S. W. Silver, Esq., Neil Bannatyne, Esq., Matthew Grey, Esq., and several others who have taken an interest in this undertaking.

The Solicitors for the Company in London are Messrs. Hargrove, Fowler, and Blunt, who command the requisite confidence in financial circles.

I have now the honor to inform you I have full power to negotiate and sign contracts with your Government, and shall be glad to forward to you copies of my credentials and powers, so that any and every inquiry you may deem necessary may be made into the stability and financial resources of the gentlemen with whom I am associated.

I shall be glad if the Executive will consider this proposal at an early date, and, if required, I shall be happy to supply any further information in my power.

I have, &c.,

The Hon. the Postmaster-General, Wellington, New Zealand.

AUDLEY COOTE.

2.

Mr. W. GRAY to the CHAIRMAN, Telegraph Cable Committee.

SIR,—

General Post Office, Wellington, 3rd October, 1872.

I have the honor, by direction of the Hon. the Postmaster-General, to forward to you the

enclosed copy of correspondence, &c., relating to the subject of a Submarine Telegraph Cable to connect New Zealand with Australia.

I have, &c.,

W. GRAY,

(for Secretary).

The Charman, Telegraph Cable Committee.

Messrs. HART and BUCKLEY to the Hon. the COLONIAL SECRETARY.

SIR,—

Wellington, 20th September, 1872.

We have received a letter from Audley Coote, Esq., Agent for "The Tasmanian Main Line Railway Company (Limited)," informing us that he has forwarded by last mail to Julius Vogel, Esq., late Treasurer of this Colony, specimens of the proposed telegraph cable to connect New Zealand and Australia, and certain proposals in reference thereto, as to construction, &c. Copies of our client's powers will be forwarded to us by next mail, after which we will submit same for your consideration. We are instructed to inform you that a power of attorney will be sent to ourselves, enabling us to act in Mr. Coote's absence in reference to any question which may arise in connection with this business, without referring the same to London. Should our client receive any encouragement from the Government, he will be prepared to visit New Zealand at once, and treat personally with your Government.

With regard to railways, our client informs us that it was understood between himself and the late Government, that the Company which he represents would have the contract for the construction of parts of these works. Twelve engineers from England and America, men of considerable experience, are now employed by the Company in Tasmania, and our client will be prepared to send to New Zealand some of those gentlemen to survey every line for a contract of not less than £250,000.

They have already introduced into the country a considerable number of immigrants from England, and would no doubt do the same as regards New Zealand, should the Government look favourably on the scheme.

We shall be glad to hear the views of the Government of the points submitted, in order that we may communicate with Mr. Coote as quickly as possible.

We have, &c.,

HART AND BUCKLEY.

The AGENT-GENERAL to the Hon. the COLONIAL SECRETARY.

7, Westminster Chambers, Victoria Street, Westminster, S.W.,

25th July, 1872.

SIR,—

I have the honor to transmit herewith a proposal from Messrs. Siemens Brothers, Telegraph Engineers, for the laying of a submarine cable between New Zealand and Australia.

I have, &c.,

I. E. FEATHERSTON,

Agent-General.

SIEMENS BROTHERS to the AGENT-GENERAL.

SIR,—

3, Great George Street, Westminster, S.W., 24th July, 1872.

As we understand from what passed at our Mr. Carl Siemen's interview with you on the 17th instant, that the Government of New Zealand is desirous of seeing telegraphic communication established between New Zealand and Australia, we beg to inform you that we are prepared to undertake the formation of a Company to carry out this line of telegraph if the Government of New Zealand will guarantee to the shareholders a net interest of 6 per cent. per annum on the capital required, which we estimate at £330,000, such interest to be guaranteed from the date of the successful submersion of the cable, and the guarantee to remain in force during such periods as the cable shall be in working order, reasonable time as well being allowed for executing repairs.

Should the net profits earned by the Company in any one year exceed 6 per cent. on the capital invested, we propose that the Government of New Zealand should participate in the profits to the extent of 25 per cent. of such excess over 6 per cent.

We make out that the direct distance between Cape Farewell and Sydney (which we presume would be the places chosen), is 1,100 nautical miles, and for this distance the supply of 1,330 nautical miles of cable would be required.

We should propose to leave to future arrangement the selection of landing places for the cable, it being understood that if, owing to alteration of route, the length of cable required were increased more than ten miles, the capital on which guaranteed interest is asked would have to be increased proportionately.

We annex a specification (A) of the cable which we propose should be laid. The working speed of such a cable, if the best instruments at present known were used, would be theoretically sixteen words per minute, and practically ten to eleven words per minute.

For an increase in the cost of the cable of £6,000, the speed would be increased to eighteen words per minute as the theoretical and twelve words per minute as the practical speed, and in that case the core given under specification (B) would be used.

We should propose that the Company should commence with a tariff of one shilling per word, leaving any alteration to further agreement.

We have, &c.,

SIEMEN BROTHERS.

SPECIFICATION A.

The Core to be the same throughout.

The Conductor to consist of seven copper wires laid up together with a strand weighing 100 lbs. per nautical mile (2,029 yards), conductivity of the wire to be equal to at least 90 per cent. of that of pure copper.

The Dielectric to consist of three coatings of gutta-percha and compound, weighing 132 lbs. per nautical mile.

Total weight of Core 232 lbs. per nautical mile. The core in every case to be served with best jute yarn.

Outer Coverings.

Heavy Shore-end Cable (No. 4505)—10 nautical miles required.

The sheathing to consist of 12 galvanized Best Iron wires, each 0.365 of an inch diameter, laid on spirally, the whole then served with two layers of jute hemp and asphalt compound, laid on alternately. Total weight of cable when finished, about 13½ tons per nautical mile.

Light Shore-end Cable (No. 4507)—10 nautical miles required.

The sheathing to consist of 12 galvanized Best Iron wires, each 0.236 of an inch diameter, laid on spirally, the whole then served with two layers of jute hemp and asphalt compound, laid on alternately. Total weight of cable when finished, about 6 tons per nautical mile.

Intermediate Cable (No. 4509)—30 nautical miles required.

The sheathing to consist of 12 galvanized Best Iron wires, each 0.160 of an inch diameter, laid on spirally, the whole then served with two layers of jute hemp, and asphalt compound laid on alternately. Total weight of cable when finished, about 3 tons per nautical mile.

Main Cable (No. 4511)—1280 nautical miles required.

The sheathing to consist of 9 galvanized homogeneous iron wires, each 0.099 of an inch in diameter, each wire served separately with strings of Manilla hemp yarn, and drawn through compound, the served wires laid on spirally, and the whole passed through compound. Total weight of cable when finished, about 1¼ ton per nautical mile.

Sections of the above described cables are shown on the annexed drawing.

Specification B.

(The Core to be the same throughout.)

The Conductor to consist of 7 copper wires laid up together into a strand weighing 112 lbs. per nautical mile (2,029 yards). Conductivity of the wire to be equal to at least 90 per cent. of that of pure copper.

The Dielectric to consist of 3 coatings of gutta percha and compound, weighing 142 lbs. per nautical mile.

Total weight of Core, 244 lbs. per nautical mile. The Core, in every case, to be served with best jute yarn.

The outer sheathing to be similar to those mentioned in Specification A.

SIEMEN BROTHERS.

3, Great George Street,
Westminster, S.W., 24th July, 1872.

SIEMEN BROTHERS to the GENERAL MANAGER, New Zealand Telegraph.

SIR,— 3, Great George Street, Westminster, S.W., 25th July, 1872.

Having heard from their Agent-General in London that the Government of New Zealand is desirous of seeing telegraphic communication established between New Zealand and Australia, we have sent in to the Agent-General a proposition for the formation of a company for laying a cable between Cape Farewell and Sydney.

We hear that other tenders besides ours have been sent to the Government; and as we presume that the Government will follow your advice in making their selection, and believing that you have hitherto been satisfied with the manner in which we have executed your orders, we trouble you with this letter to request your favourable consideration of our proposition, supposing our terms to be as good as those of others.

We think it right to add, that we make our own cores, both gutta-percha and india-rubber, and that our existing means for sheathing cables are as large as those of any other telegraph cable manufacturers.

We are able to turn out from 100 to 200 nautical miles of cable per week, according to the description of cable.

We have, &c.,
SIEMEN BROTHERS.

Mr. J. A. BIRD to Mr. E. RICHARDSON, M.H.R.

Canterbury Chamber of Commerce,
Christchurch, N.Z., 9th August, 1852.

SIR,— I have the honor by direction of Committee of the Chamber to hand you copy of resolution passed at a meeting held yesterday, to the following effect:—

“That, in the opinion of this Committee, the commercial and general interests of New Zealand would be much benefited by the connection of the Colony with the outside world, by means of a submarine cable to Australia.”

Trusting the matter will receive your earnest consideration,

I have, &c.,
J. A. BIRD,
Secretary.

Edward Richardson, Esq., M.H.R., Wellington.

