

line of telegraph, I have to remind you that no reply has yet been received from you, and to request your attention to the matter at your earliest convenience.

I have, &c.,

G. ELIOTT ELIOTT,

Secretary.

Alfred Sheath, Esq.,

Telegraphic Engineer, Christchurch.

No. 3.

General Government Electric Telegraph Department,

Christchurch, May 26, 1865.

SIR,—

In compliance with your request, contained in letter noted in the margin, relating to the best point for crossing Cook's Strait with a telegraphic cable, and the probable cost, I have the honor to forward you the following information :—

In my letter, noted in the margin, I thus addressed—"The Honorable the Postmaster General—it would be a matter of great importance to get soundings taken in Cook's Straits to ascertain the nature of the bottom, so that the best route may be decided upon for conveying a cable across, and information at the same time be afforded as to the nature of cable required."

I will quote the answer I received per letter quoted in the margin, which was as follows :—

"It is not the intention of the Government to take any immediate steps towards laying the submarine telegraph across Cook Strait. When the land communication becomes further advanced this will be taken into consideration."

As I have received no communication as to soundings, I had recourse to the best means at my command, namely, the Admiralty Chart and the New Zealand Pilot.

In selecting a route for a telegraph cable, four things have chiefly to be avoided : A rocky and uneven bottom ; strong currents ; ground likely to be interfered with by ships' anchors, and difficult shores for landing the cable.

Taking these questions into consideration, I have arrived at the conclusion—that the points, and best place to cross Cook Strait, will be on the south, from a point in Cloudy Bay near the mouth of the Wairau ; and on the north, at a point at the head of Lyall's Bay.

The cable will require to be laid in a slight curve, so as to avoid a deep hole in the middle of the Straits, which lies between the points I have indicated.

The distance from South Point to North Point is about thirty-eight miles, and if we allow ten per cent. for slack and casualties, the whole length of cable to be ordered from England will be about forty-two miles.

Although I have avoided, as much as possible, the evils that can affect a telegraphic cable, I should still further recommend precautionary measures in the manufacture itself.

I should, in the first place, recommend the adoption of a very strong cable, owing to the shallowness of the Strait, for this would render it less liable to breakage in the case of accident by fouling of anchors.

The form of cable I should recommend would be one containing three conductors, or three separate wires, for telegraphic purposes. This would render communication more certain ; as, should one, or even two conductors fail, the other might remain good till the necessary repairs could be effected.

It is, moreover, not at all improbable that the amount of business between the two Islands will require two or even more lines, so as to prevent the delays that arise from the accumulation of messages. The extra cost of such a cable, which would certainly be much less than one-third in excess of that of a cable with only one conductor, would be more than compensated for by the advantages derived.

The form of conductor, I should propose, would be a copper strand, consisting of seven wires, and similar to the conductor used in the first Atlantic cable, making a conductor in size number twelve, Birmingham wire gauge.

The insulation, I should propose, would be gutta percha. This course I am led to adopt owing to the fact that the character of gutta percha has been fully established, while the other insulations require time to prove their permanent character and durability.

The size of insulator for each conductor should be thick enough to make each separate core intended to constitute the general core form a thickness corresponding with the size of a wire of number one, Birmingham wire gauge. The three cores I should propose putting together with hemp, which would serve as a pad to protect the core. The core I should next cover with a heavy sheathing, composed of wires of number one, Birmingham wire gauge, laid on spirally. As these outer wires are very liable to corrode, and be wasted away by the action of sea water, I should propose protecting them by one of the methods recently used in the manufacture of the latest sub-marine cables, and, I think, the plan adopted with the Atlantic cable, namely covering the separate wires with Manilla yarn steeped in some preserving material, is the best yet proposed.