of construction. This point has been selected for reasons stated at Line A, and can be changed to any part of the Spit. The Eastern Spit is separated from the mainland by the Ahuriri Lake, a shallow arm of the sea, so that the mainland can nowhere be reached from the Spit without crossing about one mile of water. The land, wherever reached, is covered at high water, and is subject to be flooded from 4 to 6 feet.

The line which I have selected is 97 chains long, but of this it is proposed to form 21 chains by embankments ; and, as it strikes the highest ground, the remaining portion it is proposed to form as timber viaduct, the ground being all suited for piles. Depth of water, from 2 to 5 feet at high water, with 2 to 4 feet of soft mud; but in time of floods, with easterly weather, the depth of water is increased by 3 feet.

As considerable difference of opinion exists here respecting the best way of overcoming this difficulty—the cost of construction and tear and wear of timberwork being very considerable : more than that of embankments—I may be allowed to say a few words in justification of my views. I object, for two reasons, to embankments in this instance ; firstly, they necessarily prevent the free egress of the water in time of floods, raising the water-level of the whole estuary, causing, in this way, increased height of embankments, &c. ; and secondly, in this particular instance they will stop the tidal current through the inner harbour (the Iron Pot), necessarily causing its rapid silting up. I may add that the cost of embankments in the stream will be very heavy, owing to the great subsidence in the soft bottom, and owing to the cost of the necessary substantial rubble facings in such exposed positions. The road leading to the port, which is only formed at the edge of the water, cracked from the earthquake of 1863 in many places where nearest the water, and has subsided from 9 to 15 inches in several places.

I propose to cross, by a viaduct of 990 feet, to Gough Island, thence form an embankment of 16 chains, 4 feet 6 inches high ; again a viaduct of 1,782 feet to Battery Point ; thence 6 chains of embankment along the base of the hill, and thence a viaduct of 2,046 feet to Meanee Flats. Estimating the viaduct, with copper-sheathed piles, at £2 10s. per foot, the cost to reach Meanee Flats will be about £12,485. From the bottom of the Flats to the head of Purimu Creek, 202 chains, embankments averaging 3 feet 6 inches will be required, at £10 per chain, the land being subject to flood to that depth : thence only light formation is needed to the bank of the Tutaekuri. This river is here 1,848 feet wide, and may be bridged at the rate of £3 per foot. The north bank is above flood level, but the south bank is generally flooded after 3 inches of rainfall in 24 hours, when the ground is moderately saturated, and the country for a width of 45 chains is subject here to the overflow of the Tutaekuri, which has worn away its south bank about half a mile above the bridge,

A viaduct of 1,800 feet, at £2 per foot, is indispensable adjoining the bridge, as an embankment would necessarily flood the north bank of the river. From the embankment to the Tutaekuri-Waimata, the ground is safe, and requires only light formation.

From the rising ground south of the Tutaekuri-Waimata to Ohiwia, the land is generally subject to flood, as the Waitio, which is practically the Ngaruroro, fills, in time of floods, the lagoon about one mile above our line, and as the two streams which form the outlet of the lagoon are not capable of carrying the water, the country along our line, from the north bank of the Tutaekuri-Waimata to the rising ground south of Ohiwia, forms in time of floods a sheet of water with the exception of a few narrow strips of dry land. Considerable waterway will therefore have to be provided, as continuous high embankments would only increase the distress.

I propose, in addition to the bridges over the Tutaekuri-Waimata and the Owahou, to erect viaducts, in the aggregate, of 1,980 feet, at £2 10s. to £3 per foot, and 165 chains of embankments from 3 to 5 feet in height. From the embankments to Karamu Junction the line is sound and level, and requires only light formation.

The distance of the Line B is 12 miles 22 chains, at a cost of £35,561, against that of Line A of £9,067.

As the trial lines from Karamu Junction to Takapau diverge from that point, the merits of Lines A and B may be considered here, before proceeding with the description of those lines.

Line A has the following advantage :—

1. It will be cheaper by over £26,500 ; consequently save in interest £1,300 per annum.

2. The cost of maintenance will be very small, the aggregate of the timber work not exceeding 960 lineal feet, at a cost of £3,840, while on Line B the timber work will be 10,498 feet, at a cost of £26,900. Allowing the tear and wear of timber bridges to be only at the rate of 7 per cent. per annum, which I believe is below the real rate of decay, the yearly wear on Line A will be about £270 on that account, while Line B will cost yearly £1,953. Of course, during the first few years, the expense for repairs of bridges (not reckoning accidents) will be very trifling, but after five years it will tell very heavily, as proved by the experience of countries like Canada and America, where timber work is in use.

3. The speed to be obtained on Line A will be much greater than on B, as the maximum speed over bridges and viaducts probably cannot exceed two miles per hour (which is the American rule), and as those timber works are divided over the whole length of the line, preventing the train from obtaining full speed, a train would probably take nearly three hours to reach Karamu Junction from the Spit, a distance of twelve miles, while less than half the time should be sufficient from Napier.

4. The Line A is less subject to stoppages caused by the effect of floods than Line B, owing to the extensive timber works and embankments.

5. Line A supplies the requirements of the large agricultural population of Clive and Havelock, while it excludes only that of Meanee, where the lands are merely used for grazing purposes. The inhabitants of the district near Pakowai and Lower Karamu will likewise be served better by Line A.

Line B, on the other hand, has the advantage of being practically one mile shorter (the other being carried only to the first mile-post), and of leading direct to the port ; but I do not think that these advantages can outweigh those in favour of Line A, the difference of interest and tear and wear alone amounting to nearly £3,000, a sum bearing a large proportion to the yearly earnings of the whole line.

Under these circumstances, it appears the best to select Line A, and connect it with the port either by tramway *viâ* Coote Road and Shakespeare Road, which can be constructed, inclusive of the