

able structure; having been designed to stop the passage of any vessel during the last war, it occupies the whole breadth of the stream, with the exception of a centre passage just wide enough for our boat. Above the junction of the Waitoe the country becomes higher, and the river rapidly decreases in depth, becomes exceedingly tortuous, and so full of snags that we could not navigate it with a canoe; we explored the river on foot to Te Awa, Waikato, a distance of sixteen miles, where all navigation is stopped by a fall of 10 feet. This point is near where the proposed railway would cross the Piako, and is about thirteen miles from Hamilton.

A few miles below this we passed an outcrop of coal on the river bank, but the Natives would not allow the smallest portion to be removed, and a party who came up shortly after, for the purpose of putting down a trial shaft, were driven off with threats. We explored the Waitoe in a canoe up to the point where the proposed line would cross it, but found it so shallow, tortuous, and full of snags as to render it useless for navigation. Heavy rain falling at this time, on our return passage, after leaving the Waitoe, we sailed for twenty miles across the country, steering by compass, without any regard to the river. This river is much inferior to the Thames for all purposes of navigation, the stream resembling a very tortuous canal on which no vessel of speed could be employed, and the upper portion, where the banks are inhabited, being so shallow as to be impracticable a considerable portion of the year. Should the coal on its banks be developed, it would require a tramway to near the junction of the Waitoe; and a moderate expenditure in removing snags and cutting off bends on the lower portion would render it available for crafts at low speed, with this objection, that the consumption could not be in towns on its banks, and barges suitable for the river traffic would not be safe to cross the Firth in all weathers, as a heavy sea sets on the shore with north-westers, and they would be liable to great detention.

REPORT ON FLYING SURVEY OF PROPOSED RAILWAY—SHORTLAND TO WAIKATO.

This survey has, from the beginning, been prosecuted under unusual difficulties, arising from the sullen and defiant conduct of the Natives, requiring great caution on our part to enable us to proceed with the work. The greatest opposition was from the Ohinemuri Natives, who at last drove us off by force of arms. Many of the Natives between the Thames and Waikato seemed to favour the undertaking; but the murder of Sullivan occurring whilst I was in the vicinity of Cambridge, the Natives became excited, and advised me to desist. I spent a week returning slowly over the ground, when an accident to the instrument prevented the survey of this portion being as complete as I could have wished. The survey commences at the terminus of the Grahamstown and Tararu line, traversing the beach to the south end of Shortland, when it crosses property of little present value, to the Kauwaeranga Stream, passing close to Shortland Wharf. The works required are a retaining wall along the beach, with filling, as shown on section marked A, which is similar to that of the G and T line in front of Grahamstown, and is an average section. Provision will be required for the passage of the Karaka Creek, and four street drains. The Grey Street crossing will be level, and a filling of two and a half feet required to the Hape Creek, with retaining wall. The filling and retaining wall will be continued to the Kauwaeranga Creek. As the population is increasing above this point, and the stream navigable for small craft, it would require a swing.

From this point the line runs over a succession of fern plains and swamps, passing through three small bushes, to the Thames Crossing, between Ria Te Papa and Te Aroha Mountains, a distance of twenty-nine and a half miles. The whole of this distance is practically level, and the swamps are easily drained where the line crosses them. The longest bridge on this length is the Ohinemuri, and the aggregate length of all the bridges on this portion is 986 feet. The Thames will require a bridge of 184 feet; and as it is some miles below where navigation by steamers can be carried, and the banks too low to allow crafts to pass under, it will require a swing.

The country between the Thames Crossing and Hamilton is very favourable, crossing the fern flats and swamps forming the lower portion of the great plain of this Province to the gorge at Te Awa, Waikato. This gorge is formed by the passage of the Waitukaruru, which, rising on the Waikato side of the range, runs several miles parallel to that river, and then turning east falls into the Piako. From Te Awa, Waikato, the line runs along the higher or south side of the great swamp of 62,000 acres, and leaving it enters on the fern flat which extends into Hamilton, passing down Clyde Street into the reserve at the ferry landing. With the exception of about 6,000 yards of cuttings near Te Awa, Waikato, the whole of the line is level, the swamps requiring a ditch on each side the material thrown into the formation. There are no heavy bridges on this portion, the aggregate length required being 652 feet. This portion has not been chained, and I estimate the length at under thirty miles.

The Kauwaeranga Creek and sea beach would furnish an unlimited amount of excellent ballast, and most of the creeks between Shortland and the Thames Crossing would furnish an adequate supply. The pumice formation from the Thames to Waikato would furnish its own ballast.

A large quantity of excellent timber for sleepers would be furnished by the ranges to the east of the line between Shortland and the Thames Crossing. On the portion between the Thames and Waikato, near the Waitoe, the line passes large totara bushes, a large portion of which is on Government land. An unlimited supply of first-class kauri timber of all dimensions can be supplied by the powerful saw-mills in operation on the Thames, and also from the various mills on the coast near us. All material used on the line could be conveyed by water either from this place or direct from Auckland to any point up to the Thames Crossing. Rails, &c., for the Waikato portion would have to be delivered at this crossing, the cost of carriage being much less than by the route through Mercer and the Waikato. Material could be delivered at the crossing at 17s. per ton from Auckland and at 10s. from Grahamstown.

Vessels of any draught could discharge here into steamers suitable to convey it direct to the crossing. The advantages of cheap and direct communication between the large consumers of this district and the producers of the Waikato cannot be too highly estimated. At present all the agricultural produce consumed on the gold field is procured at uncertain intervals, chiefly from the adjacent Provinces or Colonies.