

send all the produce from his extensive run by the railway, as a station on the north side of the Waipara River, as I have before alluded to, would afford accommodation for that purpose.

I have purposely kept open this report until our arrival at the Waiau, as I should then have had an opportunity of passing again through the country that forms the route of the other line; and I must say that I feel more than ever convinced that the best route for the main line is through the Hurunui and Waiau Districts, for whatever life and travel at present exists, and from all appearances is likely to continue, is undoubtedly through this part of the country, and the land, contrary to the other line, appears to be in possession of a far greater number of persons. The grades that constitute, equally with the traffic, a most important feature of a line of railway will compare most favourably with any of the other lines that have been examined; whether we take the West Coast line, from Nelson by way of the Buller River, the Wairau and Clarence Rivers by way of Jack's Pass, the Wairau, Tardale and Acheron and Clarence Rivers by way of Jollie's Pass, or the Awatere, Ward's Pass, the Acheron and Clarence Rivers, by way of Jollie's Pass. The steepest grade by way of the coast line is that at the Greenhills, which I have reason to believe will not exceed 1 in 40.

From a second examination of the line between the Kaikoura and Waiau Townships I feel certain that all the grades as shown upon the sections accompanying my former report can be much improved; and, as we now have an exploration of all the possible routes for a line of railway between Amberley and Blenheim, I feel myself justified in recommending that a trial "survey line" should be made through this district, so as to be certain of its practicability and the nature of the grades the country will afford.

As the most expensive and at the same time the most difficult portion of the line is between the Waiau and Kaikoura Townships, especially in respect to grades, this portion might be done first, and if found satisfactory the other portions can be done afterwards, more especially that along the sea-coast between the Kaikoura Township and Flaxbourne.

The Engineer-in-Chief.

I have, &c.,

THOMAS M. FOY.

No. 3.

Mr. T. M. FOY to the ENGINEER-IN-CHIEF.

Survey of Trial Line for Railway, Conway to Kaikoura.

SIR,—

Kaikoura, 24th October, 1877.

I have now the honor to forward you plan, section, and report of the above-mentioned work.

As the line by the Campbell Creek and the crossing of the Conway River, with that of the ascent from the Greenburn to Greenhills, constitutes, in my opinion, the most difficult portion, as regards the location of the main line from Amberley to Blenheim, I was anxious to have the former portion included in this survey. We therefore commenced at the saddle, on the western side of the Whale's Back, instead of at the Conway River.

With the view of expediting the survey I subdivided the work, giving the first 11 miles—namely, from the above-mentioned saddle to the Charwell River—to Mr. Simpson, with Mr. Evans, cadet, as an assistant; whilst the remaining 25½ miles, including the Greenhills portion, I took myself, assisted by Mr. Coom.

I have prepared an index map of both plan and section, by which the grades and the general direction of the surveyed line will be seen at a glance. By the plan it will be seen that the general direction of the line surveyed between the two extreme points is favourable enough. The only place where any marked deviation occurs is at the crossing of the Charwell River. The sharpest curve upon the line of survey will be of five chains radius, but this only occurs in two or three places—namely, at the ascent from the Greenburn to the Greenhills (and which I need scarcely remark is unavoidable owing to the configuration of the ground), and at the Campbell Creek.

The grades, as will be seen by the index section, are not quite so uniform as I had expected, that of 1 in 25, the ruling gradient, occurring in many places. The frequent recurrence of this grade is caused, first, by the descent from the saddle at the Whale's Back to the Conway River, and then by having to rise over the Quail Range, and from the Charwell River on to the high ground at the Greenhills, with the descent from that place to the Greenburn. But when the Cribb Creek is reached the grades immediately improve, and will continue favourable, with the exception of one or two places, the whole way to Blenheim.

This survey embraces that portion of the main trunk line situate between the saddle at the Whale's Back to the point where the line along the sea-coast commences, and in regard to length is 36 miles 43·55 chains. It also includes that portion of the line that I mentioned in my former report as being likely to cause extra expense in working, owing to the steepness of the grades, and as containing about a mile of bridging.

Division 1.

The Campbell Creek.—The line by the course of this creek has been surveyed, and I must say that it has been found to be far more rugged than I had anticipated. However, it was necessary that a survey should be made, as I knew that it was the only route that would give us a grade so as to enable the line to be worked on the one principle. The steepest grade along this creek is, as the section shows, 1 in 25, but wherever it occurs the cuttings are very heavy. The alternative line is over the Whale's Back, showing respectively grades of 1 in 28 and 1 in 7.

No doubt but the line along the Campbell Creek could be somewhat improved in location, but not sufficiently to alter the general character of the work, or in any way to improve the grades. The crossings of the Conway River in connection with this route cannot be improved. However, as we now have a complete survey of the creek, having surveyed both sides, and thereby ascertained the best line obtainable, we are in a position to make a fair comparison between the two routes.