

Leader; thence, passing close to the station of the Parnassus Run, it crosses the Leader River about two miles from its junction with the Hurunui, and, ascending the high ground at Hawkeswood, it passes within half a mile west of the station to the crossing of the Conway; thence along the north bank of the Conway River for about two miles, where it ends, it having been considered that from this point the route any further northwards becomes impracticable for a line of railway.

This is a line the route of which was examined for comparison with that portion of line No. 3 commencing at the north bank of the Waipara River, and passing by the Townships of Waikari, Hurunui, and Waiau, and thence over the Whale's Back, to the Kaikoura Township.

My opinion of a line of railway by this route is fully recorded in my report to the Engineer-in-Chief in the year 1876 (*see* Appendix, page 7), in which I have given my reasons why the line, in my opinion, becomes impracticable beyond the point marked A upon the sketch map, about a mile and a half down the Conway from the crossings of that river.

*Line No. 5.*—This line commences at a point on one of the intercoastal lines and the Haupiri Flats, and, after crossing the Ahaura River, it follows the upward course of the Nancy Creek to the saddle of the ridge which divides the Nancy from the Tass River; leaving the saddle, it follows the last-named river until it reaches the Grey, the valley of which is traversed as far as its junction with the Brown Grey.

Here the line leaves the valley of the Grey River, and ascends a tributary named the "Brown Grey" as far as its junction with the Mary Creek, which it follows to its source at Mackay's Pass.

Here the line proceeds over the saddle that forms the watershed of the Grey and the Marina Valleys, and, after traversing for about twenty miles the downward course of the Marina River and across the plains, it ascends the River Warwick to a saddle in a range of hills, which it crosses, and then follows the River Warbeck to its junction with the Matakataki.

The line then traverses the valley of this river for about sixteen miles to the point where it crosses the Buller, then it joins the line surveyed by Mr. Rochfort, and proceeds up the Buller as far as its junction with the Hope River; but, instead of following the course of this river, and that of Mr. Rochfort's line over the Hope Saddle, it continues along the Buller to its source at Lake Roto-Iti. From the lake it follows the upward course of a small tributary thereto, through the Black Valley, and over a low saddle, to Tophouse, ending at a point about a mile therefrom in the valley of the Wairau, on the north side of the river.

There is a branch, as shown upon the sketch map, from off this line at the head of the Marina Plains to Reefton; but, as this does not enter into competition with that of any other, and as there is not the remotest probability of its ever being constructed, I do not think it necessary in this place to describe it, but must refer you to a notice of it in my report upon the Lewis Saddle and Cannibal Gorge Survey.

This line, No. 5, is a line like that of No. 1, main trunk line, with its northern terminus at Nelson, and is in many respects similar to that surveyed by Mr. Rochfort, and described in the first part of this report, and is common to that line along the valley of the Buller River for some distance.

The whole of this line, as shown upon the sketch map, namely, from the Haupiri Flats to Tophouse, has been surveyed, with the exception of the portion over the Marina Plains, a distance of about twenty miles, which Mr. Simpson was obliged to leave unfinished in consequence of the severity of the weather and the depth of snow lying upon the ground.

The survey of this line was ordered by the late Engineer-in-Chief in consequence of its forming part of the scheme brought under his notice by Mr. Fowler's report of a reconnaissance survey, and which has been before alluded to.

I have had the sections over the bad parts of this line plotted, so as to ascertain the nature of the grades. The first is over the saddle at the head of the Nancy Creek, which gives the following results:—

| Grades.              | Distances. |
|----------------------|------------|
| 1 in 9           ... | 20 chains  |
| 1 in 15          ... | 30   "     |
| 1 in 16          ... | 32   "     |
| 1 in 18          ... | 55   "     |

The next is over the saddle at the head of the Warwick and Warbeck Streams, which form the dividing ridge between the Marina and Matakataki Rivers. They are as follows:—

| Grades.              | Distances. |
|----------------------|------------|
| 1 in 9           ... | 60 chains  |
| 1 in 11          ... | 25   "     |
| 1 in 15          ... | 100   "    |
| 1 in 20          ... | 65   "     |

The next place with a long length of steep grade is at the saddle at Tophouse, as follows:—

| Grade.                | Distance.   |
|-----------------------|-------------|
| 1 in 20           ... | 140 chains. |

These are the grades over the worst parts of the line, and which I consider are sufficient to condemn this route, especially as I fear the grades of 1 in 9, the steepest, cannot be improved.

The general character of this line is, as before stated, very similar to Mr. Rochfort's, and running for a long distance nearly parallel to it, consequently its cost per mile would be about the same—namely, from £10,000 to £12,000.

The country it passes through is rough in the extreme the whole way from the Haupiri Flats to the Buller River.

The only part of the line that can be considered in any respect as an exception to the foregoing remark is the Marina Plains, and from its very altitude an idea can be gained of the nature of the line.

These plains are about twenty miles in length, with the average width of a mile to a mile and a half. The soil is poor and cold, being in many parts stony and swampy, leaving but a small portion