

specimens, is of a superior quality, being pure-white and of moderately fine grain. It is in a position which must be considered as easily accessible, since it is situated alongside one of the lines of railway which have been surveyed by Mr. Foy. Of course, until some work has been expended upon it, no one can say whether it will prove free from flaws and procurable in large blocks. Secondly. It is in all probability in the upper part of this formation that the reefs exist from which the alluvial gold of the Alfred River and Upper Matakiki has been derived, and it is therefore probable that prospecting in the area of country occupied by this formation will eventually be attended with success; but I would specially direct the attention of explorers to the eastern side of the area along the western flanks of the Spencer Mountains.

3. *Upper Devonian* (Te Anau Series).—All the typical rocks of this series, the aphanite sandstones, the red and green breccias, and slates, are represented in this district, but occupy only a small surface-area. They are found on the western side of the beds last described, occurring as a narrow strip from the Matakiki, at the lower part of Hunter's Plain, to the upper part of the Glenroy River. I have not paid any special attention to these beds, beyond locating them on the map.

4. *Serpentine*.—A belt of serpentine occurs, associated with the upper part of the last-mentioned series, forming a high bare hill which can be seen from Hunter's on the Matakiki; and it is continuous to the Glenroy. There are reports that copper has been found in small quantities associated with these rocks, but I did not see any specimens of that metal.

5. *Lower Carboniferous* (Maitai Series).—These beds, which consist of the typical slates and sandstones of the Maitai series, form the great mass of the Spencer Mountains, and rest unconformably upon the crystalline metamorphic rocks in the vicinity of Lake Rotorua and Lake Rotoiti, and from there until nearly reaching the Matakiki River, after which they are found to be lying on the foliated schists previously described. They are all lying at high angles with an easterly dip on the western side of the range; and in the neighbourhood of Cannibal Gorge they retreat towards the centre of the range, the foliated schists, &c., expanding in that direction. They have been prospected for reefs from time to time, but from what I can learn the creeks and rivers which drain through them have never carried sufficient alluvial gold to make them worth working, and no auriferous reefs have as yet been found.

6. *Lower Greensand*. Lower coal-measures.

7. *Cretaceous-tertiary*. { a. Upper coal-measures.
b. Clay-marls.
c. Limestone.

Although these beds are subdivided in the table and on the map, they will be most conveniently described together, since they are all part of one sequence. The formation extends from the Owen River to the Maruia River, and up the latter as far as the Sheriff River, being bounded in an easterly direction by the carbon-schists at the head of the Sheriff, the Te Anau beds and serpentines in the Glenroy, and the metamorphic crystalline rocks between the Matakiki River and Mount Murchison. Another outcrop of granite is found on the western side of the Warbeck River, and extending towards the Maruia River, which the coal-measures envelop. The general arrangement of these beds is thus represented, roughly speaking, by two synclines with axes striking about N.E.; but these have also been plicated along their course, and thus we find the strike and dip of the rocks varying a good deal at different points, making the connection sometimes rather difficult to follow out. The beds throughout are standing at high angles, the dip generally being from 45° to 50°, and the only parts of the field where this is less is in the Matakiki River, where the marls are seen between Glenroy and Hampden, and again in the Upper Maruia Plains, at which point the coal is probably at no great depth.

The division between the upper and lower coal-measures is marked by a belt of conglomerate of great thickness, which may be traced throughout the district, always occupying the same position in the sequence. An outcrop of this conglomerate occurs at the crossing of the Owen River, striking N. 40° W., and dipping S.W. at an angle of 50°; and this may be traced up on to the flanks of Mount Murchison on the side of Murchison Creek; and, following down the Buller, we find, at the junction of the Mangles River, that these beds are striking N.-S., and dipping E. at an angle of 70°, so that a syncline occurs between the Owen River and that point. The occurrence of this syncline is borne out by the fact that about a mile below the Owen River an inferior seam of coal, about 1 foot thick, belonging to the upper coal-measures, has been found; and, when we reach Hampden, two good seams of coal, 3 feet and 4 feet thick respectively, are seen on the banks of the Buller River, striking N. 40° W., and dipping N.E. at an angle of 45°. These coals are of good quality, as will be seen by the following analysis:—

| | | | | | | 3-ft. Seam. | 4-ft. Seam. |
|--------------|-----|-----|-----|-----|-----|---------------|---------------|
| Fixed carbon | ... | ... | ... | ... | ... | 56.60 | 56.20 |
| Hydro-carbon | ... | ... | ... | ... | ... | 33.79 | 38.82 |
| Water | ... | ... | ... | ... | ... | 1.20 | 1.19 |
| Ash | ... | ... | ... | ... | ... | 3.41 | 3.79 |
| | | | | | | <u>100.00</u> | <u>100.00</u> |

The ash is red, and the powder black; and they both cake strongly, the coke not puffing to any notable extent. Evaporative power: 3-feet seam, 7.3 lb.; 4-feet seam, 7.3 lb.

The strike of these seams of coal would carry them into the hill on which the trig. station has been placed to the eastward of the Town of Hampden, and Mr. Stewart informs me that he has found a seam at a point which would be absolutely on the line of strike, and that it was nearly 6 feet thick. I did not see this seam, nor hear of it until after I had left the district. After crossing the Matakiki River the beds assume a S.W. dip; and near the junction of the Maruia another outcrop of coal has been found. The section from the Maruia to the Owen River is as follows:—