

No. 6.

Dr. HECTOR to the UNDER SECRETARY, Public Works.

SIR,—

I have the honor to make the following preliminary report on the coal mines in the western district of the Province of Nelson.

In a former report (Geological Reports, 1867, p. 18) I divided the upper secondary coal fields in that part of the Colony into—

1. The Pakawau field, which extends from near Cape Farewell southwards for about fifteen miles, occupying a great part of the surface of the mountains between the valley of the Aorere River and West Wanganui Inlet.

2. The Buller, or Mount Rochfort, field, which occupies a narrow strip of mountainous country that extends southwards from the Karamea River to the Buller, a distance of forty miles, with a greatest width of seven miles.

3. The Grey River and Mount Davy field, which forms a range of mountains lying to the north of the Grey River, in which direction the formation extends for seven miles to where it is intersected by the coast.

The coal formation in each of these areas has the same general character, comprising conglomerates, and sometimes an angular breccia towards the base, followed by micaceous sandstones, grits, and shales, with seams of black coal (caking anhydrous coal). The thickness of this lower part of the formation is from 200 to 800 feet. In some localities, a thick bed of well-rounded conglomerate follows the above; but where this is wanting, the micaceous sands pass gradually into sandy clay marls of a dark brown colour, containing nodules of ironstone and marine fossils (limonite sandstones). Immediately beneath this marine formation, sometimes in the sandstone and at others resting on the surface of the conglomerate, is frequently a seam of coal of an inferior description, which will be spoken of as the upper coal. Its most common form in the district is a pitch coal, which is a variety of brown coal, containing a large admixture of resinous matter and a comparatively small proportion of constitutional water.

Marine formations to the thickness of at least 1,500 feet follow, consisting in ascending order of argillaceous sandstones, finely laminated marly shales, compact chalk marl, and calcareous sandstone.

In some localities the lower members of this series of marine formations are wanting, and the upper calcareous beds overlap on the basement rocks of the country, but generally having the coal formation represented by a thin intervening band of sandstones, shales, and pitch or common brown coal seams. From this I infer that the upper coal and its associated sandstones are the horizontal equivalents of the limonite sandstones, which I have referred to as immediately following the lower coal-bearing strata in some parts of the district.

Grey River District.

The only mine of importance which has been opened in this district is the well-known Brunner mine, six miles from the mouth of the Grey River. There is nothing to report as to this mine in addition to what has been stated in former reports, except that the workings are still quite inadequate to supply even the local demand.

The coal seam is 16 feet thick, and has been proved, by underground workings, to be of uniform quality, without admixture with slack or other foreign matter, throughout an area of 30 acres; in addition to which, the surface indications lead me to estimate the quantity of coal which is available without sinking as at least 4,000,000 tons, the area of undisturbed coal above the water-level being more than half a square mile. In addition to this a much larger quantity of coal can be obtained by sinking.

The extension of the coal to the north is interrupted by a fault, which cuts it off; but there is no reason to doubt that the seam will be again found at a deeper level, the downthrow being in that direction.

Up to the present time the extent of this downthrow has not been determined, but, from examination of the strata, and comparison with parallel faults which can be observed in the same formation on the sea coast farther to the north, I expect it to be less than 100 feet. On the south side of the Grey River the coal appears to be also cut off by a fault, but this has not yet been proved by underground working.

The Brunner mine can never be worked to advantage, nor afford any supply of coal to other parts of the Colony, until the railway connecting the mine with the mouth of the river has been constructed; and the amount of coal already ascertained to exist is, in my opinion, sufficient to warrant the expenditure authorized for this purpose; and, from the great facilities which exist for working the mine, the coal should be delivered to vessels at 8s. per ton.

After the construction of the railway, and the preliminary harbour improvements which have been recommended as part of the railway works, I believe that a good steam-tug for the bar service would be sufficient to enable small sailing vessels, in the first instance, to carry on a profitable coal trade with other ports of the Colony, and that, if the trade expands, and the coal proves, on working, to extend over larger areas, the depth of water on the bar can be hereafter materially increased by proper engineering works.

The accompanying plan shows the relative areas of coal which are above and below the water-level, and the position of the faults.

A sample from the 6-foot seam of coal that crops out on the coast six miles north of the Grey River has been analyzed by Mr. Skey, and found to be a very superior variety of pitch brown coal, resembling very much the best kind found at Shag Point, in Otago, and, like it, well adapted for gas-making, but without furnishing any true coke. It contains—

Gas and oil	...	...	...	...	...	...	...	55.40
Fixed carbon	...	...	...	...	...	...	...	34.80
Water...	...	...	...	...	...	...	...	6.20
Ash	...	...	...	...	...	...	...	3.60
								100.00