

rants the conclusion that coal cannot be reached at a moderate or reasonable depth anywhere between the brick-kiln and the Waimangaroa Railway-station.

Theoretically, it is reasonable to conclude that the low grounds of the coastal plain from the Waimangaroa to the Buller River constitute an area over which coal-measures are present underlying Recent and Miocene deposits. This is shown, in addition to the facts here given, by what appears in the Cape Foulwind section and the section between Crane's Cliff and the mouth of the Ngakawau River; but coal, except where exposed standing at high angles along the eastern border of the depressed area, cannot be reached except at considerable cost.

The low grounds of the coastal plain should be tested by boring at or near the mouth of the Ngakawau, where there are evidences of a reversal of the dip, and where rocks of the lower part of the sequence are present. At and south of Granity the agglomerated rocks on the coast-line appear to be a friction breccia in connection with the great fault; and, owing to the nearness of the granite range to the coast, there can be but a narrow strip of coal-formation for some distance to the south. A small patch of the upper coal-measures lies at the foot of the range between the first tunnel and the coal-bins at Granity.

17th November, 1900.

ALEX. MCKAY.

REPORT ON SUPPOSED COAL-SEAMS IN KAIATA RANGE, GREYMOUTH.

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THE extension of the Brunner Coalfield to the south side of the Grey Valley and along the Mount Buckley Range towards and beyond the more proximate sources of Kaiata Creek has been the hope of many interested in the welfare of the district. This hope has from time to time seemingly been confirmed by the finding of stray pieces of coal in the beds of the creeks draining the north and north-west faces of the range, and while at Greymouth during November last, on the application of Mr. Smith, secretary of the Westland Coal Company, I was directed to examine a reported discovery of coal in one of the branches of Kaiata Creek.

The reported coal-seams in the range at the source of the creek proved to be a deposit of rolled fragments of coal, forming a stratum of variable thickness, appearing on the north face of the eastern end of the range at a height of 700 ft. above the sea. The formation present is not, and cannot be, the same as at Brunnerton, and with moderate certainty it may be determined as forming the lower part of the sequence of the Miocene formation as developed in the New River district.

The carbonaceous deposit where examined is about 2 ft. in thickness, and consists of rolled pieces of coal, the largest of which are about 6 in. in diameter, the lesser a fine gravel passing into grit and carbonaceous mud, mixed in varying proportions with arenaceous sands. As a coal-seam it is of no economic importance, and is of interest chiefly as showing that the rocks of the Grey Valley Coalfield were being denuded during or prior to the deposition of the Lower Miocene deposits along the east side of the Grey Valley and in the New River district.

Though thus disappointing in immediately practical results, the examinations made are of considerable importance in making clear the relation in which the beds containing coaly matter stand to the true coal-measures to the north and north-east.

In 1873 I examined this district on account of fragments of coal having been picked up in several of the creeks draining north-east into the Grey River. I noted the coal conglomerates which form the subject of this report, but at that time could not distinguish between the younger beds containing coaly matter and the true coal-measures of Brunnerton or the overlying beds of the same sequence, and I considered that the coal conglomerates occupied a position underlying the Cobden limestone. The notes made in 1873 bearing on this question are as follows:—

“15th December.—Went along the A.K. line, and observed that wherever the bed-rock is visible this is invariably the grey or black marls that overlie the dark-blue marls lower in the sequence of strata between Greymouth and Brunnerton. . . . Following the creek upwards I at length reached the locality to which I had been directed. Here I found masses of coarse grey micaceous sandstone (brown when decomposed) completely choked the watercourse, and on such patches of shingle as had formed in the bed of the creek small pieces of coal were stranded. The bed-rock I found to be the soft dark or grey crumbling marl that underlies the Cobden limestone near Greymouth; but the whence of the great blocks of micaceous sandstone as yet was unexplained. Nowhere was such sandstone to be found *in situ*, and this rock is not represented in the sections from the Cobden limestone downwards in the direction of Brunnerton.

“The banks of the creek were composed of angular *débris* mixed with clay, and I observed that many of the sandstone blocks contained streaks of coaly matter, sometimes as coal sand, and at times the carbonaceous material was of such size that where aggregated it might be termed and did constitute a coal or coaly conglomerate. Pieces thus included, in cases, were $1\frac{1}{2}$ in. in diameter.

“Following the creek upwards for some distance, beds of the sandstone described began to appear, and at a particular place a bed of coal conglomerate was noted. At this point the bed of coal matter was not more than 6 in. thick, and the pieces of coal were small. I, however, saw blocks of sandstone in the bed of the creek that proved this coal conglomerate, or another band of the same, was sometimes 1 ft. in thickness. Other beds of sandstone became coaly to such an extent as to impart a dark colour and induce a flaggy character of the sandstone, but nowhere, except in one particular bed, did the coaly matter form a conglomerate.

“These hard sandstone bands were interbedded with layers of soft marls, which, being easily removed, have caused great slips and landslides of the superimposed sandstones, and in this way is accounted for the huge blocks of sandstone found further down the creek-bed.