The western slope showed also considerable quantities of ore scattered about on the surface, more or less aggregated in distinct locations, as though masses of ore had been set free by the wearing-away of the softer serpentine, and by the action of variable temperature and moisture rent into a greater or lesser number of fragments. A considerable quantity of this ore had been collected into heaps, and was ready for transport to the shipping-place at Croixelles Harbour.

From the above description it will be readily inferred that from the surface, and near the surface, ore can be obtained which will probably pay those engaged in collecting or mining it. In the end, however, the surface ores will be exhausted or too distant from the port of shipment, and, owing to the irregular bunchy character of the ore *in situ*, the cost of mining must increase in depth till this also will greatly reduce the margin of profit. This latter contingency is, however, dependent on the facility or difficulty of mining, and the size of the ore masses, and the ease with which further masses can be traced and exploited. The amount of work done does not afford sufficient data to enable me to express an opinion on that point, but the ore in sight warrants its extraction and transport to a market, unless, indeed, the cost of road-making should prove greater than the ore in sight might warrant.

Since the above was written a considerable quantity of ore has been brought to the shipping-place in Croixelles Harbour and sent to market, and I understand that in the immediate neighbourhood of whence this was taken there is still a large quantity of ore in sight.

10th June, 1901. ALEX. MCKAY.

REPORT ON THE PROSPECT OF COAL AT WAIMANGAROA RAILWAY-STATION, WESTPORT.

By ALEXANDER MCKAY, F.G.S., Government Geologist.

BETWEEN the 10th and 13th of November last I visited Waimangaroa for the purpose of determining the probability of finding coal at a moderate depth at or near the Waimangaroa Railway-station. The data collected and the conclusions arrived at are contained in the report which follows:—

On the Mount Rochford plateau the coal lies at various heights between 1,700 ft. and 2,500 ft. above the sea. On its western margin the high land suddenly terminates, and a steep scarp is formed descending to the lower hills and coastal plain between Westport and the mouth of the Ngakawau River. This abrupt slope marks a line of fault which extends both north and south beyond the limits described. By the action of the fault the western extension of the coal-measures has been carried to a lower level, and they now appear as strata standing at high angles dipping west, and forming foot-hills immediately south of both the Ngakawau and Waimangaroa Rivers. Towards the sea the coal-measures are covered by more recent accumulations, in the south by Miocene beds followed by gravels both fluviatile and marine, and north of the Waimangaroa by the latter only. Under the coastal plain the dip of the coal-measures is at a less angle, and there is evidence of a reversal of the dip in this direction.

The examinations made from the railway-station along the southern bank of the Waimangaroa to where the coal-measures terminate, a little east of the Wellington Mine, had for their object to determine if at any reasonable depth coal could be reached in the front hills or under the gravels of the coastal plain.

The Wellington seam, exposed on the southern bank of the Waimangaroa River, strikes south 20° west, and dips west-north-west at an angle of about 40°. The coal where showing nearest to the river-bank and where worked is exposed as a seam of considerable thickness, much crushed and tender at the outcrop. It is overlain by alternations of dark shales and dark or lighter coloured sandstones, having the strike and dip already indicated. The seam has not been traced any distance to the southward, but should extend and outcrop along the foot-hills to where they terminate, and the low swampy plain reaches east almost to the line of fault.

Along the whole line of outcrop the dip of the coal will continue to be high, owing to the drag of the strata on the down-throw side of the line of fault. The high dip might be expected to lessen rapidly as the distance increases from the west side of the line of fault, but as a matter of fact it is maintained at a considerable angle as far west as observations can be made.

By following from the coal outcrop, the section of strata exposed along the railway, it is seen that the dip is not lessened, and that before the railway-station—430 yards from the coal outcrop—is reached a very considerable thickness of strata has been passed over. Yet further to the north-west, at the brick-kilns, the dip of the strata is even at a higher angle than at the Wellington Coal-mine; and, making allowance for the difference between the true dip and the line of section, it may be shown that at the brick-kilns coal could not be reached at a lesser depth than 1,000 ft. from the surface.

Between the brick-kilns and the schoolhouse the line of section followed turns more to the westward, and the rocks present are the mudstones and sandy marls that form the higher part of the coal-bearing sequence. Dips are rarely to be determined over this part of the section, but where the new road to Denniston begins to rise on the lower slope of the front hills rocks of a sandy nature are exposed striking south-east and dipping to the south-west at an angle of 25°, or nearly at right angles to the coal-measures in the lower part of the section. This change of strike conforming with the change in the direction of the section-line, the dip is at right angles to a line from the point of observation to the brick-kilns, and the distance to the kilns being about the same as from the kilns to the Wellington Coal-mine, it follows that, at least, despite the lesser angle of dip in the higher beds, some 500 ft. or 600 ft. of strata has to be added to that already noted.

The angle of dip considered—and, so far, there is in this section no evidence or indication of a reversal of the dip—and the fact that only one seam of coal (the Wellington seam) is known, war-