

be the same as those of Kaiwhaiki, on the Wanganui River, which are referred by Park to the Older Pliocene or Upper Miocene formation.* Though possibly of younger date, for the purposes of this report they may be regarded as of that age. These younger beds on the line of route travelled, first appear at Toko, seven miles from Stratford. Beyond Toko they extend some four or five miles to the eastward, beyond which distance to the east and north shell-limestones are reported to cap or form ranges of hills in that direction.

From Toko the road to Strathmore turns to the north, and for the first five miles the rocks seen are mainly the brown sands referred to. At five miles from Toko the road crosses a ridge of hills at a height of 760 ft. above the sea, the hills to the south-east being capped by a thick shell-bed, forming a limestone which is reported to have a considerable development to the south-east, and also extends from the saddle in a north-west direction, though how far could not be ascertained. This limestone is at the present time used as a road-metal, and forms excellent roads, and is likely in the future to be valuable for other purposes—as a mortar-lime and in its application to the land. The limestone and underlying beds in position are nearly horizontal, the slight dip being to the south-west. Towards the south-west it either thins out or is covered up by the volcanic deposits of Mount Egmont that lie in that direction. North, towards Strathmore, the limestone is not again seen, the lower sandy beds appearing in that direction; and before crossing the next ridge of hills, which the road does at a height of 825 ft., there are beds of coarser grain, in part composed of small, well-rounded quartz pebbles. Beyond this second ridge of hills, which also trend to the north-west, lower and yet lower beds of an arenaceous character appear, alternating with beds of blue sandy clay, which, at and near Strathmore, contain abundance of shells, yet not in such abundance as in any sense would constitute a limestone.

On leaving Strathmore for Whangamomona, beyond the first two miles the rocks are again brown sandstones, but this development lies in a lower part of the series to that already described as being closed by the shell-limestone five miles from Toko. With these lower sands are associated bands of sandstone conglomerate, some of the boulders in which are 6 in. or more in diameter. There are two or three such bands of conglomerate, and then farther north and lower in the sequence, a very considerable thickness of brown sands underlies and forms a range of hills that, striking north-west, is crossed by the road, the saddle being 875 ft. above the sea. The beds here form an anticline, and north of this ridge the dip is to the north-east, at low angles, and this dip continues till nearing the crest of the next range of hills, which rise to a height of 1,050 ft. above the sea. The beds showing in this range are alternations of brown sandstones with blue sandy or calcareous sandy clays, with occasional bands and concretionary masses of cement-stone. The change of dip again to the south-west takes place on the south-west side of the saddle, about six miles from Whangamomona, and on this resumption of the south-west dip the same is continued to the north-east, but always at low angles as far as the Tangarakau.

From the Whangamomona Township the road follows for the first six miles the valley of the Whangamomona Stream, and the rocks, so far as seen, are a succession of soft brown (at the surface) sandstones and sandy clays more or less marly. The formed road terminates on the saddle leading into the valley of the next stream farther to the north, and thence a bridle-track leads to within a little more than a mile of the Tangarakau River, seventeen miles from Whangamomona.

Before reaching Sladden's survey camp, one mile from the Tangarakau, a high range of hills has to be crossed, which exposes marly clays with concretions. At the northern base of this range marly clays appear in which there are a considerable number of fossils—mainly marine shells, but corals belonging to the genus *Flabellum* are also present. Near Sladden's camp a change takes place, and brown sandstones are exclusively found to the Tangarakau and as far up stream and along the banks of the river as was reached by me. The last rock-exposures showed a dip still at low angles to the south-west.

So far as I reached, the strata everywhere must be referred to as Tertiary rocks, and I concluded that the rocks associated with the coal in the Tangarakau Valley must be of a different age and character. From what I learned at Sladden's camp it would appear that no change takes place, the rocks adjacent to and overlying the coal being described as similar to those passed over between the camp and Whangamomona; also there seemed strong reasons to believe that the quartz pebble-beds described as occurring some miles to the south of Strathmore are present towards the source of the river, as such pebbles are found plentifully on the banks and in the bed of the Tangarakau. Also, I could learn nothing as to the presence of the Mokau limestone in this district, and the conclusion was almost forced upon me that within this part of the Wanganui watershed the coal-seams will prove to be at the base of the Tertiary series of formations. On the other hand, from Park's description of the rocks of the Mokau coalfield† it appears there might be doubts both as to the Cretaceous-tertiary age of the Mokau coalfield and as to a difference in age of the coal that appears to lie at the base of the sequence here described. If it be otherwise the boundary between the Tertiary and the coal-bearing formation must be nearly as shown on the map of the district which accompanies Park's report of 1886 "On the Geology of the Western part of the Wellington Provincial District and part of Taranaki." The accompanying sketch shows the arrangement of the rock along the route of travel between Toko and the Tangarakau River.

The Under-Secretary, Mines Department.

ALEXR. MCKAY.

RESULT of ANALYSIS of Specimen No. 8529, forwarded by the Government Geologist from Tangarakau River. Received 29th April, 1899; reported on 3rd May, 1899.

Brown Coal.—This sample as received contained 18 lb. per cent. of water. The analysis here given was made upon it as pulverised and exposed to the air for three days—the accidental water is therefore excluded in the computation. The coal is non-coking, burns pretty fairly, and gives a buff-coloured ash.

* "Geological Reports," 1886-87, p. 57.

† "Geological Reports," 1886-87, pp. 44-47.