

bank of the river is on the land formerly controlled by Mr. Joshua Jones, of Mokau; but this property is now, the writer understands, in the hands of a Wellington syndicate. To the northward of the Mangapapa is a block of land held by the Cadman Estate, which is reputed to contain considerable coal.

To sum up, it may be said that the Mokau Valley in the neighbourhood of Stubbs's Mine contains an extensive coal-basin, which comprises several seams exhibiting considerable continuity and apparently not very markedly faulted. The coal is easy to mine, owing to the general good-standing quality of the strata in which the seams lie. Though the quality of the coal from the different seams varies somewhat, it is generally of fair grade, being most suitable for household purposes. Though resembling in places a bituminous coal, it is best described as a lignite, or perhaps more correctly a sub-bituminous coal. Its worst feature, as mentioned previously, is its ready decrepitation on exposure to the air.

Although Mokau coal is mined in proximity to a waterway navigable to the sea, the vessels which cross the bar at the mouth of the river are of such small size as to render the cost of landing the coal in the various centres of New Zealand high. Were the Mokau bar so much improved that fairly large vessels could enter the river, there would be a good field for coal-mining in this part of the Dominion.

LIMESTONE AND CLAY.—Limestone is to be seen in many parts of the valley of the Mokau. It occurs at various points in the lower part of the river, being especially conspicuous about eighteen miles above the mouth. It is of widespread occurrence in the rolling country around Paemako and Piopio, where it is frequently very light-coloured, and crystalline in character. Though differing in quality in various parts of the area, and being in places coarse and gritty, it is apparently in certain localities entirely suitable for the manufacture of lime, and also for utilization in cement-manufacture. The limestone burnt on the Mokau River is said to have produced lime of very good quality. Clays suitable for brickmaking occur in almost every part of the area under description. The limestone and clay can for the present hardly be said to be of great value, but in the future, with the opening-up of the country, they will be of definite commercial importance.

PETROLEUM.—The observed indications of petroleum and allied products in the area under review are neither very great in number, nor are they definite or conclusive in character. They may be summarized as follows:—

- (a.) Inflammable gas bubbles up fairly constantly through a pool of standing water with a boggy bottom on the right bank of the Awakino, at a point just below Papaurakohoe, and distant some seven miles and a half in a straight line from the mouth. This is apparently marsh-gas, and is probably only a surface phenomenon.
- (b.) Springs of salt water are said to occur on the Mokau River near the locality of the gas-bubbles. These were not seen by the writer, and no very definite information could be obtained concerning them. As salt water not infrequently accompanies petroleum in nature, it may be considered an indication of that natural product.
- (c.) From time to time chunks of a black viscous solid, thought to be asphaltum, are washed ashore in the neighbourhood of the mouth of Petone Creek. Judging from a sample of this material, the writer is of the opinion that it is indeed a solid bitumen.
- (d.) A surface seepage of petroleum is said to have been discovered by some bushmen in the bush to the eastward of Tongaporutu. The information obtainable on this point is very scant, and it is understood that the seepage is not now visible.

The whole of the country covered by the Mokau reconnaissance is practically unexplored geologically, and we do not know what information a careful and detailed survey (such as has been conducted in portions of the Poverty Bay district) would bring to light. It might perhaps lead to an alteration of conclusions mentioned herein. However, in the light of existing knowledge it is considered improbable that the Tertiary rocks in the area contain petroleum or its allied product in payable quantities. The following are the principal reasons for this conclusion:—

(1.) No indication of the presence of petroleum was seen by the writer in the beds at the surface, although they are faulted and tilted, and in the interior highly so. Along the Mokau River the succession of beds is in general so well exposed that some of the oil could hardly fail to escape to the surface and leave a trace, if any existed. The information regarding the alleged oil-seepage near Tongaporutu is too uncertain to be considered, nor is the very doubtful occurrence of a fissure in the sea-floor from which issues the bitumen washed ashore near Petone Creek of much value in this connection. The other supposed indications of petroleum and its allied products shown to the writer consisted of films of hydrous iron-oxide on water or as stains in the claystones, or of manganese-oxide coatings or vegetable discolorations.

(2.) The source of the petroleum at Moturoa, near New Plymouth, is thought to be entirely within the Tertiary rocks, and the petroleum to be a product derived by the slow distillation, either by volcanic heat or by the general heat of the earth's interior, of the coal-seams and other carbonaceous layers which lie near the base of that series. On the Mokau the coal-bearing horizons are exposed, and could consequently not be also the source of the petroleum. Of course, these lie beneath the surface at the mouth of the river, but not, it is thought, sufficiently deep to be greatly influenced by the earth's interior heat, and volcanic rocks apparently are unimportant here.

In much of the upper part of the Mokau country (around Piopio and Paemako especially) the Tertiary rocks are now so very scant that it seems hardly possible any great pools of petroleum could have been derived from them. If any ever existed—as products derived from the rocks now removed by erosion—these, too, would have disappeared in the general wearing-down of the land.

The chances for the occurrence of pools of petroleum may in very general terms be said to increase southward from the mouth of the Mokau towards Tongaporutu and Waitara, as the distance below