

but they may be more ancient. They are said to contain traces of copper, gold, and platinum. In the writer's opinion their economic value is of very equivocal nature. The discovery of fragments of rodingite in this locality is of interest as showing a petrological connection between the rocks of the Mokau serpentine area and those of the Dun Mountain Subdivision.

Rhyolitic rocks—in the main apparently tufa and agglomerate—are prominent on the Awakino - Te Kuiti Road, and near the Mokau River from nine to twelve miles south-west of Te Kuiti. They probably continue above the Tertiary rocks, at least in places, right through to Te Kuiti.

Tuffaceous rocks lightly shroud the sedimentaries along the coast, and extend into the interior. No attempt was made to define exactly their petrological character. Towards the coast they are apparently mainly andesitic, but probably in the interior they may merge into rocks of more acid type. This volcanic coating is conspicuous because of the rusty soil which it affords on weathering.

ECONOMIC GEOLOGY.

As remarked in a previous paragraph, the economic geology of the area covered by the Mokau reconnaissance may be discussed under the headings (1) coal, (2) limestone and clay, (3) petroleum. The possibility of the occurrence of traces of copper, platinum, and gold in serpentine rocks near Wairere Falls has been mentioned; but this possibility is not worthy of further elaboration here. Similarly, too, the widespread ironsand mentioned before is not of immediate economic interest, and need not be discussed.

COAL.—Coal was seen by the writer on the Awakino - Te Kuiti Road at a point a few miles east of Bignell's house, and at several places on the Mokau River in the neighbourhood of Stubbs's Mine. It has been reported from several points in the Upper Mokau Valley in the neighbourhood of Piopio and Paemako, and is mentioned by Professor James Park* as occurring on the Mokauiti and another tributary of the Mokau entering on the left side.

The occurrence of coal to the east of Bignell's house is economically unimportant, the coal being merely a narrow seam a few inches thick in highly tilted sandy claystones.

Several parallel coal-seams are exposed on the Mokau near Stubbs's Mine. Professor Park* mentions a section on the Mangakawhia Creek in which four seams outcrop in a sandstone face, their thickness in descending order being 2½ ft., 7½ ft., 3 ft., and 8 ft. respectively. It is probably one of these seams which is now being worked at Stubbs's Mine, a short distance to the westward. This seam is altogether about 7 ft. 6 in. thick. A carbonaceous claystone band, however, occurs in it, decreasing the amount of marketable coal, and making mining somewhat expensive. The lower portion of the seam below the claystone band varies in thickness from 3 ft. to 4 ft., while the upper portion varies from 3 ft. 6 in. to 4 ft. 6 in. The parting varies from 6 in. to 16 in. in thickness generally, but in a few places it is almost a mere knife-edge. The coal is lignitic or sub-bituminous in character, non-caking, and in general is of very fair quality, the lower portion of the seam being superior to the upper. The coal is especially suitable for household purposes, but is also of some value for steaming. Its worst feature is its ready friability on exposure to the atmosphere, and the consequent loss through pulverization in shipping.

In Professor Park's report appear two analyses of the coal from Stubbs's Mine. No. 1 is from above the claystone parting, and No. 2 from below:—

	No. 1.	No. 2.
Fixed carbon	46.17	47.58
Hydrocarbon	34.15	36.05
Water	13.92	12.79
Ash	5.76	3.58
	100.00	100.00

The enclosing rocks consist of fine greenish argillaceous sandstones, with which are interbedded more or less sandy claystones. The roof stands remarkably well, and comparatively little timbering is required even in the open bords. The coal is mined on the pillar-and-stall principle, and up to the present none of the pillars has been removed. The dip of the seam is very slight—at an angle of about 6° generally in a direction S. 66° W., and, as the mining is conducted to the rise, drainage is good, and the coal readily run out from the mine. At about 200 yards from the mouth of the main drive it is stored in a shoot on the shores of the Mokau River, and from here it is shipped by small ocean-going steamers. When the Mokau River is low the seam of coal being worked can be seen in the river-bank, and is traceable for some distance up the stream.

At the rapid occurring some twenty-three miles from the mouth of the river a seam of coal some 4 ft. 6 in. thick, and underlain by about 1 ft. of carbonaceous shale, with coaly partings, appears on the left bank of the river a few feet above the water. The under- and over-lying rocks consist of argillaceous greensandstones. A few feet below the floor of the seam a coaly parting appears in the sandstones.

About a quarter of a mile lower down the Mokau (at about 22½ miles from the mouth of the stream) are the workings of the old Stockman Mine. Here is exposed a fine seam of coal about 4 ft. in thickness.

On the Mangakawhia Creek a number of seams were examined, all of which exhibited coal of the same general quality as that seen elsewhere in the locality.

The coal being mined at Stubbs's Mine, the Mangakawhia seams, and Stockman's seam are all on the Mangapapa Block, which is the property of Mr. G. H. Stubbs, of Waitara. That on the left

* See reports of N.Z.G.S., Vol. xviii, 1887, pp. 44-47.