Moroera Stream, rising in bush country about four miles south-west of Waimana, is a small branch of the Raroa which joins the Waimana near the village. A fault striking north-east and dipping east at about 70° crosses obliquely the head of this stream and several of its eastern sources. The greywackes and argillites here strike north-north-east and dip steeply west. The fault was examined at two points in the main stream and in two small branches from the east, and at each place contained fragments and lenticles of crushed coal, some of the latter being 2 ft. long and 6 in. across. Most of the numerous movement-planes of the narrow fault-zone are black with coaly matter. There is nothing to indicate the amount of movement along the fault. Streaks of carbonaceous matter interbedded in the rocks were observed, but no coal-seams, and Mr. A. K. Luttrell, who owns the land and has done some prospecting, has not found one. The coal, as shown by the analyses below, is of excellent quality, but the chances of a workable seam being found are extremely poor. The early and middle Mesozoic rocks of New Zealand at many points contain carbonaceous bands and even lenses of coal a few inches thick and somewhat extensive, though hitherto unsuccessful prospecting has been undertaken in several localities. Mr. J. M. Cadigan, in 1911, did some prospecting in the Raroa basin, probably in this very locality. Other work has been carried out near Kaitoke, in the Rimutaka ranges, near Waiwera in Otago, and at several points in Southland.

The Moroera flows in a narrow valley entrenched about 300 ft. in rolling downs that represent an older valley-floor. The physiographic history of the area is probably complex, for a few chains south of Mr. Luttrell's house soft pumiceous silts and fine sands interbedded with carbonaceous muds and peaty layers, the whole about 100 ft. thick, form part of the downs. Except to the north-east, Mesozoic rocks rise above these fluviatile and swamp deposits which seem to have accumulated in an ancient valley.

The following analyses of the coal from the Mesozoic rocks and of the lignite from the pumiceou silts were made by the Dominion Analyst :—

	1.	2.	3.
Fixed carbon	22·27	49·62	56·67
Volatile hydrocarbons	25·50	35·29	33·47
Water at 105–110°	19·10	1·82	1·78
Ash	33·13	13·27	8·08
	100·00	100·00	100·00
Sulphur	0·51	1·56	0·97
Coking-properties on heating in a closed vessel	Non-coking	Slightly swollen	Swells and forms fairly firm coke.

No. 1 : Lignite, sent by Mrs. H. E. Luttrell.
No. 2 : Coal from Moroera Stream, sent by Mrs. H. E. Luttrell.
No. 3 : Coal from Raroa Stream, sent by Mr. J. M. Cadigan, 1911.

8. GREAT BARRIER COPPER-MINE.

(By J. Henderson.)

Captain F. W. Hutton (Rep. Geol. Explor. during 1868–69, pp. 1–7 ; 1869) and Professor J. A. Bartrum (Trans. N.Z. Inst., Vol. 53, pp. 115–27 ; 1921) have described the geology of the Great Barrier Island. In December, 1930, the present writer spent three days at or near the old copper-mine and is able to add a few details to the accounts Hutton and Bartrum have given.

The northern part of the island is formed of steeply dipping greywackes and argillites, probably of old Mesozoic age. From the mine, which is at the north-west corner of the island, to the Aiguilles, at the north-east corner, the cliffed rocky coast shows innumerable dykes of igneous rocks. Most of those seen near the mine were of intermediate composition, and were no doubt intruded while the andesites so prominent on Hauraki Peninsula were being erupted ; Great Barrier Island is obviously on the same crustal ridge as the peninsula and the range that continues it southward. At Miner's Head and at several points on the sea-cliffs eastward the rocks show decidedly the green and blue stainings of copper minerals. The copper deposit must have been found in the early days of colonisation, for E. Jerningham Wakefield records that he saw ore from it in 1843, and that 100 tons of ore was later shipped to Sydney (" Adventure in New Zealand from 1839 to 1844," p. 578 ; reprint by Whitcombe and Tombs, 1908). Hutton notes that the deposit was actively worked between 1857 and 1867, and records that 2,323 tons of ore of unstated grade was produced during this decade from 3,200 cubic fathoms mined (about 8,000 tons).

The ore, which consists of shattered and silicified argillite, contains numerous nests, pockets, and veinlets of chalcopyrite, the whole more or less strained by copper carbonates. A large chamber, approached by an adit 150 ft. long and a few feet above sea-level, has been excavated in the narrow peninsula forming Miner's Head. The chamber is about 150 ft. long and averages 40 ft. wide. The roof has collapsed, and except at its southern and narrow end a great mass of broken rock covers the