(3.) From upper part of Kaiata Creek, Greymouth district.
(4.) From Podge's Creek; impure coal.
(5.) From Podge's Creek; bright coal.

The occurrence of waterworn pebbles of coal in the Miocene strata near Greymouth and near Seddonville is of great interest and importance, for it clearly indicates an unconformity between the coal-measures and the overlying Miocene rocks.

Pleistocene and Recent Deposits.

Gravels that may be regarded as of Pleistocene age form, as already mentioned, terraces in the Upper Ngakawau Valley, and the terraces that border the Seddonville Flat in places. The Pleistocene gravels grade into talus on the one hand, and into younger gravels, such as those on the Seddonville Flat, on the other. The coastal plain is covered by Recent marine gravels.

Granite.

Granite forms the core and most of the crest of the Marina Range. A narrow band of granite can be traced along the base of the range for some miles. There are many exposures in the foothill country, especially in Chasm Creek and in the gorges of the Ngakawau River and some of its tributaries. It appears also in the Upper Mackley watershed. Its metamorphic influence on the Aorere rocks has already been mentioned.

Gneiss.

West of a line drawn about two miles from the base of the Marina Range there are many outcrops of gneiss and gneissic granite. These are especially noticeable in the gorges cut by the Ngakawau River and most of its tributaries through the coal-measure rocks. Gneiss underlies the coal-measures in Charming Creek valley, as is shown by the records of Nos. 3 and 6 bores.

In all the main exposures the gneiss is seen to pass here and there into unfoliated granite in an irregular and puzzling way. It may be that the gneiss is simply a foliated phase of the granite. On this supposition it is extremely difficult to account for the foliation of the gneiss. Appearances support the view that the granite is a recrystallized phase of the gneiss. How this may have come about is a question not suitable for discussion here.

III. Economic Geology.

In bygone years a considerable amount of alluvial gold was obtained in the area examined during the past season. The main mineral resource of the district, however, is its coal. Other economic materials, such as building-stone, agricultural limestone, &c., hardly call for more than passing mention at the present time. Hence the economic geology of the area may be considered under two headings only—(1) Alluvial Gold, and (2) Coal.

(1.) *Alluvial Gold.*

Near the mouth of the Mokihinui River a rich beach-lead was discovered in 1865, and after being worked for some years was abandoned as exhausted. About 1887 a continuation of the lead was discovered, but apparently this was of no great extent, and was soon worked out.

Hodges Creek, a stream descending from Mount Kilmarnock to the Rough-and-Tumble (a tributary of the Mokihinui) has been somewhat extensively worked for alluvial gold, but has been deserted for many years. The various streams that drain the western slopes of the Marina Range cut through grauwackes of the Aorere Series containing small quartz veins, and might therefore be expected to contain alluvial gold, but so far as the writer knows nothing but scant colours can be obtained from the creek gravels. The Mackley River may be to some extent an exception, but the head of this stream has been tested with unsatisfactory results.

In the upper course of Watson Brook, a tributary of Charming Creek, gravels clearly derived from the Marina Range occur. These yield colours of gold, and on that account prospectors have sunk one or two test-pits. These, however, on account of water, did not reach bed-rock, upon which possibly payable washdirt may lie.

(2.) *Coal.*

Many years ago attention was drawn to the coal resources of the Mokihinui district by Sir James Hector, who apparently entertained a very high opinion of the area as a coalfield, and mapped the greater part of it as containing coal. Attempts to mine the coal began about 1879, and since 1889 exploitation has been carried on almost continuously. Unfortunately, however, the patchy nature of the coal-seams, their liability to spontaneous combustion, the friable nature of the coal, much of which is unmarketable at the present time, and the occurrence of faults, have proved serious drawbacks to successful working. Until economic and other conditions change considerably, it is apparent that the task of winning coal from the area at a profit will be difficult, and, now that the best areas have been partly worked, perhaps impossible. If, however, a satisfactory commercial method of utilizing the friable coal could be evolved, the prospects of success would be immensely improved.

Coal-seams.—In the coal-bearing areas an upper and a lower seam are generally recognized. The lower or main seam appears in a horizon which is generally about 50 ft. below the upper seam, and 100 ft. below the marine beds. The thickness varies from a few inches to 25 ft. In the present workings of the State mine it is almost everywhere over 14 ft. In the old Cardiff Mine the coal was of good thickness in most places. Near the mouth of Chasm Creek, where coal was mined many years ago, the seam does not average more than 4 ft. or 5 ft. in thickness, and to the south-west becomes