

OFFICERS' REPORTS.

DR. J. HENDERSON, MINING GEOLOGIST, AND MR. M. ONGLEY, ASSISTANT GEOLOGIST.

During the latter part of 1914 and the early months of 1915 Dr. J. Henderson, Mining Geologist, was occupied chiefly in writing a bulletin dealing exhaustively with the geology and mineral resources of the Reefton Subdivision. As already noted, he was engaged in field-work in the Gisborne Subdivision during a brief period in October, 1914, and again from the latter part of March, 1915, to the end of May. He also visited the Weber-Herbertville district, and furnishes a report thereon, which, together with another on the Murchison district, is printed on a later page.

From October, 1914, to the end of the field season, Mr. M. Ongley, M.A., Assistant Geologist, was continuously engaged in the Gisborne Subdivision. Dr. Henderson and he furnish the following report on their work in that area:—

GISBORNE SUBDIVISION.

Introduction.

Work in the Gisborne Subdivision was begun in October, 1914, but the necessity for completing the bulletin on the Reefton Subdivision obliged the senior writer to return to Wellington within a few weeks. He was again in charge of the field-work from March till the end of the season; during the interval operations were conducted by Mr. Ongley. When completed the Gisborne Subdivision will include the survey districts of Uawa, Whangara, Wainata, Waikohu, Patutahi, and Turanganui, in all an area of nearly 790 square miles. The easy nature of the country and the favourable weather-conditions permitted about three-fifths of this area to be covered during the season.

The main objects of the work are to determine—(1) Whether oil-bearing rocks are present; (2) what is the horizon of the oil-bearing rocks, if present; and (3) what is the structure of the strata.

Although the country examined has been almost denuded of bush, and has been subject to recent elevation, conditions both favourable to the discovery of outcrops, nevertheless the rocks are on the whole of so weak a nature, and consist to such a great extent of structureless mudstone, that the determination of the above data has so far been accomplished to a minor degree only.

Topography.

The area exhibits the characteristics of a maturely sculptured land-surface which has been uplifted fairly recently for several hundreds of feet above its former level. Remnants of this old surface still exist in some localities. Thus the wide valley of the Waihako at Waerenga-o-kuri, lying at an elevation of about 1,100 ft., contains a swampy meandering stream, which down-stream becomes deeply entrenched in its valley-floor. This locality furnishes also admirable examples of stream-piracy, probably brought about by the same elevation. The Waihako drains by way of the Wairoa to the distant waters of Hawke Bay. Branches from the Te Arai and Mangatoetoe, tributaries of the Waipaoa which empties into the near-by Poverty Bay, now drain through their deeply incised valleys much territory that formerly belonged to the Waihako.

A study of the terraces of the coast-line and of the main river-systems makes it clear that the elevation has taken place intermittently. Thus at Te Karaka terraces on the hill behind the railway-station occur at a height of 550 ft. above sea-level. A middle series of terraces, 150 ft. to 200 ft. above sea-level, is well seen along the Waihuka Stream. The low terraces and old flood-plains that form the floor of the present valleys are being swept away by their originating streams, which in most cases are now entrenched from 10 ft. to 20 ft. below them. These lowest terraces and flood-plains correspond in height with the marine-built plains that form the Poverty Bay flats and the narrow coastal plains fringing the indentations of the shore-line.

In spite of these evidences of elevation, the continuation of the present stream-valleys through the wave-cut platforms, so characteristic of the coast of this portion of New Zealand, proves that within recent times the land has stood at a higher level. The present position of the strand, in fact, must be considered to be the sum of the several positive and negative movements that have occurred since the close of the Pliocene.

General Geology.

McKay, who has had better opportunity of forming an opinion than any other geologist, considers that three sets of beds occur in the Gisborne district—namely, Cretaceous, Miocene, and Pliocene. Adams, who examined in detail the Whatatutu Subdivision, which adjoins the Gisborne Subdivision on the north, was unable to make this separation, and tentatively placed all the rocks, save the manifestly superficial, in his Whatatutu Series. There is, however, little doubt of the correctness of McKay's view.

Practically the whole of that portion of the subdivision examined by the writers is covered by Tertiary beds. Only at one locality, Whangara Island, were the older rocks observed. At this place vertically disposed green sandstones, believed to form the base of the Miocene, are in contact with hard somewhat calcareous claystone, the "indurated chalk-marl" of McKay. What is the precise relation between the beds has not been determined.

The Miocene strata of the subdivision have a thickness of several thousands of feet, and may be divided into three groups of beds. The lower, in general, consist of well-consolidated green sandstones, which, as at Whangara Island, are occasionally decidedly calcareous from the inclusion of numerous shell-fragments. Again, they may become coarser and contain pebbles of hard igneous rocks, as in the Manakaha about three miles from its junction with the Waihuka, where the rock can be called a conglomerate. These greensands are evidently beach deposits, and as such they are free from mud-particles. Terrestrial conditions seem to have sometimes prevailed. Thus just south of Whangara Island coaly matter is interbedded with the sandstone.