

GEOLOGICAL SURVEY.

This year the Geological Survey continued the exploration of the Dannevirke and Reefton districts and began the examination of the Greymouth, Moeraki, and Glenorchy subdivisions. The Reefton and Greymouth areas were mapped many years ago, but the work carried out on this occasion was much more detailed and was undertaken for special purposes.

The mapping of the mineralized areas of Kirwan Hill and Alexander River, the only remaining portions of the Reefton Lode-belt to be examined, was completed this year. Thirty years ago the Kirwan's Reward Co. mined blocks and fragments of quartz found on the surface and mixed pell-mell with broken slate and sandstone. This deposit appears to be a large slip derived from nearby higher lode-bearing country.

The Moeraki Subdivision, in north-eastern Otago, covers part of the belt of younger strata fringing the schists of that region. The district contains the Shag Point coalfield. Indications of oil also occur, but the chance of a profitable deposit being present is not good.

The Glenorchy Subdivision includes alluvial diggings now largely deserted as well as quartz veins carrying scheelite and a little gold. The high mountains of this region makes exploration arduous and even dangerous, and in order to expedite the mapping aerial photographs were taken.

That New Zealand has relatively little high-rank coal has long been known. The detailed geological mapping begun this season in the Greymouth coalfield is to obtain the data necessary for a more accurate estimate of the amount of coal available, in order to allow of this limited natural resource being utilized to the best advantage. The area is extremely rugged and difficult, and air photographs will be used to reduce the labour involved.

Geophysical work was carried out at Waiuta and Kotuku. Both areas are covered with gravel and moraine, and in the latter these loose deposits completely mask the structure of the petroliferous strata. At Waiuta the cover is more broken. The Blackwater lode has been worked for many years, and other auriferous quartz veins of which the outcrops are hidden may well be present in the seven miles of mineralized country between Waiuta and Merrijigs. The main features of the structure in the Kotuku region have been worked out. Suggestive results have been obtained from magnetic surveys in the thermal regions and also in relation to the ore deposits at Onekaka.

Geologists spent five weeks on a visit to the oil seepages at Madagascar Beach, on the coast between Martin Bay and Milford Sound. The seepages are in Tertiary rocks which, however, are much disturbed, and there are other definitely unfavourable features which make the chances of commercial oil extremely poor.

Dr. H. J. Finlay has joined the staff of the Geological Survey as micropalæontologist. The value of the foraminifera as a means of determining stratigraphical horizon is widely recognized in America, Europe, and the Dutch East, and the study of these minute forms will provide more data for the correlation of different groups of rocks and for the elucidation of their structure.

Two geological bulletins were issued during the year.

OBSERVATORIES.

The Dominion Observatory at Wellington, the Magnetic Observatory at Christchurch, and the Apia Observatory, Western Samoa, have carried out their usual programme of astronomical, seismological, meteorological, and magnetic observations.

The customary annual survey of seismic activity in New Zealand has been prepared by the Dominion Observatory with the co-operation of the observatories at Christchurch and Apia, the Post and Telegraph Department, officers of the Marine Department and other Government Departments, and a number of voluntary observers, whose assistance is gratefully acknowledged.

Further improvements to the seismograph equipment at the Dominion Observatory and other seismograph stations have been made during the year, and these will enable more rapid progress to be made with the study of local earthquakes and related problems. An instrument for measuring the tilting of the ground was repaired and reinstalled at the Dominion Observatory during the year. Tilt records are likely to provide valuable data on local land movements, and may be of some assistance in the problem of earthquake prediction.

Interesting observations on cosmic-ray activity have been made at Christchurch, and correlated with magnetic disturbances and auroral displays.

An extensive study of the radioactivity of New Zealand rocks and soils has been completed.

PLANT RESEARCH BUREAU.

The Plant Research Bureau organization has made good progress during the year in the co-ordination and reorganization of all plant research activities. The whole of these are under constant review by the Plant Research Bureau Committee, which, on account of its representative personnel, ensures a proper balance of research activities.

During the year the Agronomy, Grasslands, and Entomology Divisions and the Botany Section have been provided with new buildings so that they can undertake their investigations under much improved conditions. The laboratories and offices are situated in the midst of the field-trial areas. The construction of the buildings for the Plant Diseases Division at Mount Albert, Auckland, is about to commence. Meantime, the larger section of the staff is still accommodated at Palmerston North. Very good progress has been made in the preparation of the field experimental area of this Division at Mount Albert, the whole of which is now available for trial purposes.