

GEOLOGICAL SURVEY BRANCH.

REPORT OF DIRECTOR (DR. J. HENDERSON).

During the year ended 31st March, 1940, official visits were made to Onekaka, Greymouth, Charleston, Lyell, and Reefton. A summary account of the Alpine mine at Lyell appears in this report.

Mr. M. Ongley worked with Dr. Lillie in the Dannevirke district. Later he visited Tokatoka, North Auckland, and collected samples from critical sections in the Gisborne and Hawke's Bay regions; summary accounts of the results of his work are included here.

Dr. J. Marwick completed the manuscript of, drew illustrations for, and supervised the preparation of the photolithographic drawings of the maps to accompany the bulletin describing the Te Kuiti Subdivision now in the press. He named the fossils of many collections made by the field officers. With Dr. Finlay, he wrote an account of the subdivision of the New Zealand Tertiary and Cretaceous rocks.

Dr. H. J. Finlay made many determinations of the foraminifera in samples sent in by the field officers and by oil companies. He also prepared descriptions of key species of foraminifera found in the Cretaceous and Tertiary formations of New Zealand.

Dr. C. O. Hutton worked chiefly on the rocks and rock slides of the Otama intrusive mass of the Wakaia Subdivision. He visited the area and collected samples from critical points.

Mr. H. E. Fyfe, assisted by Messrs, R. J. Bagge, M. Gage, W. E. Hall, and others, continued the detailed mapping of the Greymouth coalfield. Unfavourable weather again greatly hampered field-work, which it is hoped to complete next season.

Dr. A. R. Lillie extended geological mapping over unexplored parts of the Dannevirke Subdivision. The examination of this district, begun in 1936, has been greatly delayed owing to long leave being granted to several of the officers engaged. The field-work will probably be finished next season.

During the winter Mr. R. W. Willett worked on the manuscript of the Glenorchy Bulletin, which is now well forward. In November he began field-work in the Orepuki Subdivision, a district containing deposits of alluvial gold, coal, and oil-shale. With Mr. Wellman, he prepared a report on the oil-shale, which is shortly to be published in the *New Zealand Journal of Science and Technology*.

In an endeavour to bring the Geological Survey into closer touch with the economic problems of the day, officers of the Survey have examined a number of deposits of mineral substances likely to be of use in New Zealand industries, though not themselves of high intrinsic value. Mr. E. O. Macpherson, after preliminary investigation, recommended that the bentonitic clays of the Porangahau district be trenched and sampled, a work carried out by Mr. R. G. Coventry. Mr. Macpherson also examined deposits of white-burning feldspathic clays at Kaka, in Nelson, and these Mr. B. L. Taylor is now prospecting and sampling. Other deposits examined are those of manganese ore near Auckland and the barite-fluorite deposit near Baton Saddle. Mr. Macpherson also traversed the east shore of D'Urville Island and the coast of Croixelles Harbour in search of chromite, and prepared a reconnaissance map showing the distribution of serpentine on the former. He visited Waihi, Thames, Manukau North Head, and Great Barrier Island.

Mr. J. Healy mapped in detail, and prospected by boring, the sulphur deposits at Rotokaua, near Taupo. His report is to be published in the *New Zealand Journal of Science and Technology*. During the winter he worked on the manuscript of the bulletin describing the Wakaia Subdivision.

Other officers examined deposits of commercial or possible commercial value. Mr. M. Gage studied the iron-ores of Onekaka, and advised prospectors for gold deposits in their work near Brunner and in the Big River area, Reefton. Mr. Fyfe visited the Alpine Mine at Lyell, and the mica deposit at Charleston. Mr. Willett reported on fuller's earth, near Gore, and collected sands to be tested for stream tin at Manapouri. Dr. Hutton took samples of copper-bearing schists outcropping in Kawarau Gorge.

Mr. N. Modriniak carried out geophysical work at Onekaka, where, by seismic methods, he determined the depth of the ore-deposit at a number of points. He also examined dam-sites on the Waikato River at Karapiro, near Cambridge, and at Ohakuri, near Atiamuri, using seismic and magnetic methods.

Mr. H. W. Wellman investigated, by means of seismic and magnetic methods, the oil-shale deposit at Orepuki. During the winter of 1939 he prepared the maps of the Glenorchy Subdivision from aerial photographs and got ready the field-sheets of the Orepuki district.

Mr. A. W. Hampton prepared the photolithographic drawing of the eleven maps to accompany the Te Kuiti Bulletin. He also made plans, sections, and graphs and did much other miscellaneous draughting, including the preparation of a large-scale map for the Centennial Exhibition, mentioned later.

Mr. D. H. K. Ross attended to the different sections of the office work, as well as to the library. He also prepared, chiefly in his own time, the numerous photomicrographs illustrating Dr. Finlay's accounts of the foraminifera.

Last year the thirty-third annual report of the Geological Survey was issued and Bulletins 38 and 39 published. The head office of the Department published Geological Memoir No. 5 by C. O. Hutton, containing an account of the geology of part of western Otago. Members of the staff wrote the following papers that appeared in the *New Zealand Journal of Science and Technology*: "The Titaniferous Ironsands of Patea, with an Account of the Heavy Residues in the Underlying Sedimentary Series"; "Optical Properties and Chemical Composition of Two Micaceous Minerals from Westland"; and a review on R. C. Evans' "An Introduction to Crystal Chemistry," by C. O. Hutton; and "A Glacial Valley, Mount Aurum, Skippers Creek Survey District" and "The Invincible Quartz Lode," by R. W. Willett.