

Whatatutu Subdivisions, Raukumara Division," by Dr. J. Henderson and Mr. M. Ongley. In addition the following papers and reports by officers of the Survey were published in the *New Zealand Journal of Science and Technology* :—

- "Avoca or Whatarama District—Mount Torlesse Collieries, &c." (Vol. 3, No. 3.) By P. G. Morgan.
- "Geological Features disclosed by Excavations at the Proposed Dam-site at Arapuni, Waikato River." (Vol. 3, No. 4.) By J. Henderson.
- "Tangarakau Coalfield, North Taranaki." (Vol. 3, Nos. 5 and 6.) By P. G. Morgan.
- "Reefton Coalfield." (Vol. 4, No. 1.) By J. Henderson.
- "Notes to accompany a Geological Map of the Cheviot District." (Vol. 4, No. 1.) By J. Henderson.

Since the end of the year Palæontological Bulletin No. 8, "Lists of New Zealand Tertiary Mollusca," by the late Mr. Henry Suter, has been issued. This bulletin, in addition to Mr. Suter's lists, contains notes and a review of results by Mr. P. G. Morgan.

OFFICE-WORK, ETC.

The office-work performed during the year has been of the usual character; a large amount of correspondence has been attended to, and numerous requests for information on matters more or less connected with the work of the Survey have been answered. Several samples of rock to be used in roadmaking or for other purposes have been identified for the Public Works Department. Samples of several clays of good quality have been received and forwarded to the Dominion Laboratory for analysis. Samples of drillings from the Blenheim oil-bore, New Plymouth, at depths exceeding 5,500 ft. have been carefully examined; these were mainly sandy claystones, containing petroleum in small quantity. The occurrence of petroleum-bearing strata in the New Plymouth district at so great a depth is a matter of much importance. Some of the drillings consisted largely of magnetic oxide of iron (ironsand), which was low in titanium content, and therefore essentially different from the modern ironsands of the present coast-line.

Samples of ochre and wad (hydrated manganese oxide) of splendid quality for paint-making purposes were received from a resident of New Plymouth. These came from the neighbourhood of Puketiti Hill, Carrington Road, between the Kaitaki and Pouakai ranges. Ochres of good quality were also received from Omakau (Central Otago) and from the Waihou district, near Te Aroha. A sand (artificially concentrated) from a spot a mile and a half inland from Purakanui Bay (Catlin's district) was of a very interesting character. It contained much zircon and a small percentage of rare earths (mainly ceria); other constituents were magnetite, ilmenite, a little chromite (chromic oxide 0.2 per cent.), and gold (10 dwt. 2 gr. per ton). Platinum, which was reported by the sender to be present, was not detected by the Dominion Laboratory, but the presence of chromite points to its probable occurrence in portions of the drift from which the sand was derived. Other mineral specimens received include polishing-carths from Puhipuhi and Wairakei, sharpening-stone (grey-wacke) from Waihao (per the Under-Secretary, Mines Department), barite from Rawene (Hokianga district), &c.

The Geological Survey is indebted to the Dominion Laboratory for the chemical examination of most of the more important mineral samples sent to the Geological Survey or collected by its officers. The analyses need not be given here, as they will be published in the annual report of the Laboratory.

Maps, &c.—During the year Mr. G. E. Harris, draughtsman, drew eight maps to be reproduced by photo-lithography, and ten others were partly drawn. He also prepared fifteen drawings for blocks, twenty-seven large field sheets for the use of officers in the field, and 110 miscellaneous drawings and tracings.

LIBRARY.

During the year numerous publications were received in exchange for Geological Survey bulletins, and a few books, mostly relating to economic geology, were acquired by purchase. The library now numbers about six thousand volumes, in addition to a large number of pamphlets and duplicates. It is invaluable for reference purposes to the members of the staff, and books from it have been lent to a number of persons who are either members of other Government Departments or are scientists of standing.

OBJECTS OF GEOLOGICAL SURVEY.

The preparation of geological maps and of geological reports describing the areas mapped form the primary work of a Geological Survey. Such work, however, is not to be regarded as the end to be achieved, but as a means for reaching other objectives, which in the final analysis are of utilitarian character.

The chief object kept in view by the New Zealand Geological Survey is the development of the mineral resources of the Dominion, not by itself setting out to discover and work mineral deposits, but by giving needful information (1) to prospectors, (2) to miners, and (3) to manufacturers and others who use mineral substances or products in their business. In part this information has immediate value, in part its value depends upon future work or research of some kind. The point needing emphasis is that most of the information required is not recorded in books or in the minds of men: it has to be sought for in the book of nature. Geological maps and descriptions serve mainly as an indispensable basis for geological research.

The Geological Survey by its investigation of natural resources is of use to many persons other than those mentioned above. It helps the agriculturist, the timber-miller, the civil engineer, the harbour engineer, the hydro-electric engineer, the builder, the roadmaker, and many others. By its publications it also helps the teachers of geology, who are endeavouring to train the next generation of geologists to do better and more useful work than has been done in the past.