

1920.
NEW ZEALAND.

MINES DEPARTMENT.
GEOLOGICAL SURVEY BRANCH

(FOURTEENTH ANNUAL REPORT (NEW SERIES) OF THE).

Laid on the Table of the House of Representatives by Leave.

SIR,—

Wellington, 3rd July, 1920.

STAFF.

During the past year the staff of the Geological Survey has been considerably increased. The new officers are: Mr. H. T. Ferrar, M.A., F.G.S., Geologist; Messrs. J. Marwick, M.A., and L. I. Grange, M.Sc., A.O.S.M., Assistant Geologists; Mr. E. O. Macpherson, A.O.S.M., Field Assistant.

Mr. (Major) H. S. Whitehorn, on his return from the front, rejoined the Survey as Assistant Topographer, but was shortly thereafter transferred to the Forestry Department.

SUMMARY OF FIELD OPERATIONS.

During the latter part of the year under review three field parties have been employed, one in the Middle Waikato district (Huntly Subdivision), under Dr. J. Henderson, Mining Geologist; one in the Whangarei district (Whangarei Subdivision), under Mr. H. T. Ferrar, Geologist; and one in the Collingwood district (Collingwood Subdivision), under Mr. M. Ongley, Assistant Geologist. The area geologically surveyed amounts to about 1,100 square miles. Since 1909, until this year, the Geological Survey has never had more than two parties in the field at any one time, so that in this respect the past year has been one of progress. Great difficulty, due mainly to the low scale of wages offered, was experienced in obtaining efficient field hands. This not only retarded progress, but threw an additional burden on the already overweighted shoulders of the field geologists.

In each of the three districts mentioned above, detailed geological survey has been undertaken, largely on account of the presence of coal deposits. Although the investigation of our coal resources is a matter of great importance, it may be as well to point out that the present scarcity of coal in New Zealand is due primarily to a shortage of labour, and not to a shortage of coal available for mining, as seems to be the common belief. On the other hand, unless fresh discoveries are made and new mines developed, there will be a real scarcity of available coal before many years have passed.

Brief visits for special purposes were made by the Director to the following districts: Bay of Islands, Puhupuhi, Avoca (Northern Wairoa), Golden Stairs Tunnel (North Auckland Main Trunk Railway), Moehau (Coromandel), New Plymouth, Woodville, and Red Rocks Point (Wellington). Similarly, Dr. J. Henderson visited Reefton (twice) and Cheviot. Mr. H. T. Ferrar visited Press's farm, some miles north-west of Kawakawa, and Kioreroa, near Whangarei, in order to report upon coal and oil possibilities, and Mr. M. Ongley made special inspections of the marble-quarries and a reputed phosphate-find near Takaka.

HUNTLY SUBDIVISION.

Work in the Huntly Subdivision, which contains an important coalfield, was resumed in December last by Dr. J. Henderson, assisted by Mr. L. I. Grange. At the end of May about 300 square miles had been surveyed in detail. At the beginning of June Dr. Henderson returned to Wellington in order to begin the preparation of a detailed report. Mr. Grange, however, remained in the field in order to complete the survey of the subdivision.

WHANGAREI SUBDIVISION.

The exact extent of the Whangarei Subdivision has not yet been settled. Provisionally it includes the survey districts of Hukerenui, Opuawhanga, Purua, Whangarei, Taiharuru, and Taranga. The subdivision as thus defined includes several separate areas where coal is being worked. It also contains deposits of mercury-ore, silver-ore, manganese, &c. The limestone deposits are of great importance, both for the manufacture of cement and for agricultural purposes. The survey of the Whangarei Subdivision is under the charge of Mr. H. T. Ferrar, who began work last November, and at the end of May was still in the field.

COLLINGWOOD SUBDIVISION AND ADJOINING AREA.

The Collingwood Subdivision consists of the survey districts of Onetaua, Pakawau, and Paturau, together with the northern part of Whakamarama Survey District and a small part of Kahurangi Survey District. It contains several coal-bearing areas, some of which have been worked, but not on a large scale. Mr. M. Ongley, Assistant Geologist, assisted by Mr. E. O. Macpherson, began work towards the end of September, 1919, and remained in the field till the middle of June, by which time the survey of the subdivision was completed. A detailed report on the area is now being prepared.

Attention may be drawn to the discovery by Messrs. Ongley and Macpherson of marble in great variety and inexhaustible quantity within a mile of the shore of Golden Bay, two to five miles north of Collingwood. There is reason to believe that quarries capable of yielding large-dimension stone can be easily established under favourable transport conditions.

During the years 1908-9 Whakamarama Survey District and adjoining areas to the south and south-east were topographically surveyed by members of the Geological Survey staff. A portion of this territory was also geologically surveyed by the late Mr. E. J. H. Webb and others.

Owing to Government deeming it necessary to restrict expenditure the survey was prematurely abandoned. The district thus discarded is a wild mountainous area, practically unsettled, and very difficult of access. It forms, however, part of a belt of country which probably contains gold-bearing lodes, as well as other mineral deposits, and is well worth exploration. Authority for a resumption of geological survey in this district has been given, but the scarcity and high cost of suitable labour may prevent the work from being carried out for some years.

PALÆONTOLOGICAL WORK.

Mr. Henry Woods, M.A., F.R.S., of Cambridge, England, has done some further work on New Zealand Cretaceous fossils, and a brief report has been received from him on the subject.

Mr. Frederick Chapman, A.L.S., F.Z.S., of the Melbourne National Museum, has continued to work at intervals in his spare time on the collections of Foraminifera and Ostracoda sent to him some time ago. His report thereon ought shortly to be ready.

During the past year a considerable number of fossil identifications have been made by myself and other members of the staff, working, however, under great difficulties.

Mr. John Marwick, Assistant Geologist, who has lately joined the Survey, has been detailed to palæontological work, and is now studying the Tertiary Mollusca, which are considered to be of great importance in connection with the correlation of New Zealand coal-measures.

PUBLICATIONS.

The publications issued by the Survey during the past twelve months are as follow:—

Thirteenth Annual Report.

Palæontological Bulletin No. 7: "Descriptions and Revisions of the Cretaceous and Tertiary Fish-remains of New Zealand." By Mr. Frederick Chapman, A.L.S., F.G.S., Palæontologist to the National Museum, Melbourne.

Bulletin No. 22: "The Limestone and Phosphate Resources of New Zealand (considered principally in Relation to Agriculture): Part I, Limestone." By myself and other members of the Geological Survey Staff.

In addition the following articles and reports were published in the *New Zealand Journal of Science and Technology* during 1919 and the early part of this year:—

"Permo-Carboniferous (Maitai) Rocks of the Eastern Part of the South Island of New Zealand." (Vol. ii, No. 1.) By P. G. Morgan.

"Chrome-iron Ore, Mica, and Tungsten-ore in New Zealand." (Vol. ii, No. 1.) By P. G. Morgan and J. Henderson.

"Talc, Manganese-ore, Clay and Fullers' Earth, and Oil-shale in New Zealand." (Vol. ii, No. 2.) By P. G. Morgan.

"Graphite in New Zealand." (Vol. ii, No. 3.) By P. G. Morgan.

"The Organization and Functions of a State Geological Survey." (Vol. ii, Nos. 4 and 5.) By P. G. Morgan.

"The Splitting of the Mangatini-Matipo Coal-seam, Buller-Mokihinui Coalfield," and "The Application of a Change-of-Volume Factor to the Correlation of Coal-seams and Coal-bearing Strata." (Vol. ii, No. 6.) By P. G. Morgan.

"Mokau Subdivision," and "The Taranaki Coalfield." (Vol. ii, No. 6.) By J. Henderson.

"Coal Prospects at Waiwera, Auckland." (Vol. ii, No. 6.) By J. A. Bartrum, Lecturer in Geology, University College, Auckland.

"The Tertiary Beds of Central Otago." (Vol. iii, No. 1.) By P. G. Morgan.

"A Mineral new to New Zealand—Pilotite." (Vol. iii, No. 2.) By J. Henderson.

At the present time Bulletin No. 21, entitled "The Geology of the Gisborne and Whatatutu Subdivisions, Raukumara Division," by J. Henderson and M. Ongley, has reached the final-proof stage, and will shortly be issued. This bulletin gives a new interpretation of the geological structure of the Gisborne district, which those interested in the attempt to establish an oil industry would do well to study carefully.

The present cost of printing, preparation of illustrations, &c., is a matter of serious import to the Geological Survey. The prompt publication of the results obtained by scientific workers is essential to progress, but at present the cost is almost prohibitive. Unless adequate means of publication is assured, both the volume and the quality of scientific work inside and outside Government Departments are bound to fall off.

OFFICE-WORK, ETC.

Information on many matters, some not of a geological nature, has been supplied to the Mines Department, to other Government Departments, to scientific institutions, and to members of the public. As examples of the subjects of inquiry may be mentioned—Coal; petroleum possibilities; iron-ore; limestone for agricultural purposes, cement, and carbide manufacture; roadmaking materials; building-stones (marble, &c.); monumental stones; clay; fullers' earth; magnesia-bearing rocks; asbestos; faulting in coal and gold mines; and water-power.

As Chairman of the Board of Examiners under the Coal-mines and Mining Acts I have attended to a considerable amount of detail not connected with the Geological Survey. On two occasions I have acted as a member of the Loan Board constituted under the provisions of the Mining Act (Part X) and the Coal-mines Amendment Act, 1919.

The work done in the draughting office during the year includes: Two maps fully drawn and five maps partly drawn for photo-lithographic reduction; thirty-three sheets on the 20-chain scale drawn for use in the field; completion of four similar sheets partly drawn about 1908; 164 tracings and miscellaneous drawings.

LIBRARY.

During the year numerous publications were received in exchange for Geological Survey material. A catalogue of the library, which now contains over five thousand volumes, is in preparation. The housing of this valuable collection in a wooden building, and its consequent exposure to the risk of destruction by fire, is a matter that causes me some anxiety.

I have, &c.,

P. G. MORGAN,
Director, Geological Survey.

The Hon. Minister of Mines, Wellington.