PETROLOGY

The Petrology Section has continued to give valuable service to the field geologists, Government Departments, and the public. Aggregates have been examined for reactive materials. A paper, "The Emplacement of the Bluff Norite—a Re-interpretation," was written, and it gives the first application of granitization in New Zealand.

GEOPHYSICS

The purchase of a gravimeter during the year marked an important event in geophysical prospecting in New Zealand. Gravity surveys will supply basic data badly needed in the interpretation of structural geology in its relation to scientific and economic problems. Gravimeters are widely used in the search for oil structures in other countries.

Magnetic and seismic methods were used for the investigation of Atiamuri Dam site. The vertical magnetic intensity was measured at approximately a thousand stations, and a magnetic map compiled. This revealed a dominant elliptically-shaped anomaly pattern which has its origin at depth, and it was later identified as being due to the presence of a rhyolitic dome. To elucidate the effect of the surface material that is of primary engineering interest, it was necessary to isolate this anomaly pattern from the total observed magnetic effect.

The Taupo Town Board's hydro scheme at Hatepe River was investigated by the same methods. A buried river-channel to the north of the present stream was located, and its general trend outlined.

Prospecting by the State Hydro-electric Department at Waipapa revealed that the Waikato River eroded through the ignimbrite sheet on which it was intended to anchor the dam structure. Initial tests by seismic methods disclosed that such discontinuities may be located by seismic studies.

Pakotai Copper Deposit.—The Pakotai copper deposit was studied by electric methods, and magnetic observations also covered the surrounding area. The results of this survey confirmed the existence of the already known ore-body, but did not suggest its extension in any direction.

Thermal Area, Tikitere.—Investigations into the thermal area at Tikitere are connected with the general scheme of ultimately utilizing natural heat for power-development. Tikitere is considered to be a suitable type locality for these studies. The application of the magnetic method disclosed low magnetic values in areas of past and present thermal activity. The Tikitere results suggest that the magnetic method may be useful in locating altered rocks at depth and give a lead to the existence of high-temperature steam below the surface. Preliminary electric studies reveal that the electrical conductivity is considerably greater over active than over non-active areas.

Foundation Problems.—Problems of foundation connected with the proposed establishment of a State saw and paper mill were undertaken in the Murupara area. Arrangements were made with the State Forestry Service to purchase additional equipment to make it possible for the survey to investigate natural frequency responses of soils to which it is intended to anchor the industrial units.

GENERAL

The Director represented New Zealand at the eighteenth International Geological Congress in London in August, 1948, and at the British Commonwealth Conference on Geology and Mineral Resources in September, 1948. Whilst overseas he also investigated the Italian scheme for utilization of natural steam for power at Larderello.

A revised geological map of New Zealand and a booklet, "The Outline of the Geology of New Zealand," was published.