

### PETROLOGICAL LABORATORY.

The services of the Petrological Laboratory have been in large demand during the year. The increasing need for wide use of stone materials for building purposes necessitates the acquisition of further knowledge of the rock resources of the Dominion, and investigations have been continued to this end. Similar knowledge is also required of the suitability of the shingle and rock supplies for highway construction and maintenance, these materials entering very largely into the manufacture of concrete and bitumen preparations. Harbour-construction and protective work dealing with shingle and sand movements along coastlines represents one of the large problems affecting harbour authorities. Valuable fundamental work on sand formation and drift has been in progress at Napier and Otago, giving results of much practical and scientific significance.

### DOMINION OBSERVATORY.

The work of the Dominion Observatory comprises two distinct branches of science—astronomy and seismology. In astronomy the Observatory has the important duty of controlling the time of the Dominion, and it does this by the use of astronomical clocks which are rated and kept accurate by frequent astronomical observations and by the reception of wireless-telegraphy time signals from other observatories. From these clocks some hundreds of time signals are sent out every year by telegraphy, wireless telegraphy, &c., and time-ball and electric-light signals are also made.

With the exceptions of the small transit telescopes and small portable refractors, the Observatory has only limited equipment for astronomical observations, and the policy has been to undertake only those researches which the position of the Observatory, having regard to both latitude and longitude, warrants. Many astronomical observations, such as the study of variable stars, meteors, occultations, and planets, are carried out by members of the New Zealand Astronomical Society, and the results are forwarded to the Observatory.

In seismology the standard equipment has consisted of two Milne-Shaw and one Milne horizontal-component seismographs. As a result of the destructive earthquake which occurred on the 17th June, 1929, in the Murchison area, and the large number of after shocks, considerable extra work has been involved in the working up of seismological records. With the object of providing for more efficient instrumental recording of local earthquakes, additional equipment has been obtained, and is now in course of erection. This equipment includes a Galitzen vertical-component instrument, a Wood-Anderson horizontal component, and an Imamura strong-motion horizontal-component instrument. In addition, an Ishimoto clinograph has been ordered. At Suva, Fiji, there is a twin-boom Milne seismograph, the records of which are sent to the Dominion Observatory.

The records from New Zealand are forwarded to many seismological observatories, and appear in the International Seismological Summary.

### APIA OBSERVATORY.

The work of the Apia Observatory, dealing with terrestrial magnetism, seismology, meteorology, and upper-air observations, has been actively continued during the year. The Director, Mr. A. Thomson, was transferred in order to undertake special observations in connection with upper-air work in New Zealand, and his place as Director has been filled by the appointment of Mr. John Wadsworth.

## REPORTS OF THE RESEARCH COMMITTEES OF THE COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH.

### DAIRY RESEARCH.

Advisory Committee: Sir George Fowlds (Chairman), Mr. A. Morton, Mr. T. A. Winks, Mr. W. Iorns, Mr. Dynes Fulton, Mr. Q. Donald, Professor H. G. Denham, Dr. C. J. Reakes, Mr. W. Singleton.  
Director of Research: Professor W. Riddet.

The Dairy Research Institute (N.Z.) is situated in temporary laboratory buildings adjacent to Massey Agricultural College at Palmerston North. The dairy factory, herds, and buildings belonging to the College are available for research purposes. Provision is now being made in the new Massey College buildings, in course of erection, for the permanent housing of the Dairy Research Institute. The staff and the facilities of the Institute are availed of during the short instructional courses conducted during the winter months, and thereby direct contact with the industry is regularly maintained.

The New Zealand Co-operative Dairy Co.'s laboratory at Hamilton, and the South Taranaki Federation of Dairy Companies' laboratory at Hawera have undertaken definite lines of investigation in co-operation with the Dairy Research Institute.

### DIRECTOR'S REPORT.

This report reviews the first complete twelve months' investigation of problems affecting the manufacture of dairy-produce by the Dairy Research Institute (N.Z.). At the close of the previous year the Massey Agricultural College dairy factory had just been recently completed, and the manufacturing experiments then in progress had not reached a stage for being reported upon. When the results of these first trials become available during the present year, experiments were considerably extended on the manufacture of cheese, and additional research work relating to the manufacture of butter, transport of cheese, analysis of dairy-products, and the production of pure milk was undertaken.