

### 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 also are made.

With the exceptions of the small transit telescopes and small portable refractors, the Observatory has only limited equipment for astronomical observations. The policy in the development of the astronomical observatory is to undertake only those researches which the position of the Observatory in both latitude and longitude warrants. As the Observatory is nearly at the antipodes of Greenwich, it is important (1) to take daily photographs of the sun, to supplement those taken at Greenwich, thus keeping the sun under closer observation; (2) to undertake photographic zenith-telescope observations for variations of latitude; (3) to undertake variable-star observations with the photo-electric cell, &c.

Many other astronomical observations, such as 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 equipment comprises two Milne-Shaw and one Milne horizontal-component seismographs. These are chiefly used in the registration of distant earthquakes. At Suva, Fiji, there is a twin-boom Milne seismograph, the records of which are sent here; for local earthquakes adequate provision has not yet been made, but a comprehensive report on requirements has been prepared.

The records from New Zealand are forwarded to many seismological observatories, and appear in the International Seismological Summary. An addition to the staff of the Observatory would appear necessary if the records are to be adequately worked-up and plotted.

### APIA OBSERVATORY.

During the past year the control of the Apia Observatory has been taken over by the Research Department, and the cost of upkeep is now included in this Department's estimates. Previously the Department's interest in the Observatory has been in a technical advisory capacity. A good year's work has been done, and the publications of the Observatory are receiving well-earned notice by workers throughout the world, as evidenced by offer of special instruments for trial, &c. The recently published monograph on upper-air currents is especially worthy of notice.

## 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 has been established adjacent to the Massey Agricultural College at Palmerston North. Chemical and bacteriological laboratories have been completed and equipped during the year. The dairy factory erected by Massey College is available for research purposes, and is designed to make provision for the manufacture of butter, cheese, and other dairy-products. The College herds also have been availed of to provide material for factory and laboratory experimental work.

Arrangements have been made for co-operative investigations to be undertaken in association with the New Zealand Co-operative Dairy Co.'s laboratory at Hamilton, and with the Hawera laboratory of the Federation of Taranaki Dairy Factories.

### DIRECTOR'S REPORT.

The Dairy Research Institute was brought into being about the end of March, 1927. The remainder of that year was taken up with arrangements for the provision of staff, laboratories, and dairy factory. While these arrangements were being completed investigations were necessarily restricted, so that the investigations undertaken in that year were limited to (a) a study of the daily variation in the production of fat and milk of the cows in the College herd, with a view to examining the extent of variation, and, as far as possible, the causes contributing thereto, with special reference to the effect of weather conditions; (b) a statistical examination of group herd-testing records, in order to obtain information upon the effect of the time of calving, age of animal, breed; and district upon fat-production.

I am glad to report that for the present year, ending 31st March, 1929, much more progress has to be recorded. When abroad, Dr. McDowall visited places of interest to dairying in England, Scotland, Ireland, Germany, Holland, Denmark, Sweden, Switzerland, France, and the United States of America. In all of these countries he made personal contact with the dairy research workers in the leading research institutions. He also gained some insight into dairy practices in these countries, and had an opportunity of discussing with various workers problems of peculiar interest to New Zealand. Amongst other details, he collected particular information relating to the pasteurization of milk for cheesemaking, the keeping-quality of unsalted butter, electric pasteurization of milk, sterile milk and ice-cream, packing of milk-powders, dairy sewerage, evaporation of whey and its utilization as an animal-food, the drying of buttermilk and outlets available for the sale of the product, the scientific control of dairy-produce in Holland, certified milk-production in Europe and America,