

OBSERVATORIES.

The Dominion Observatory at Wellington, the Magnetic Observatory at Christchurch, and the Apia Observatory, Western Samoa, have carried out their usual programme of astronomical, seismological, meteorological, and magnetic observations.

The study of seismic activity in New Zealand and fundamental research in seismology is an important part of the work of the Dominion Observatory, in co-operation with the other observatories, the Post and Telegraph Department, and a number of voluntary research workers and observers. In our present state of knowledge reliable prediction of earthquakes in regard to exact, or even approximate, time, place, and magnitude cannot be given, but generalized forecasting is approaching practicability and, moreover, is the duty of the scientist to the public in countries liable to seismic activity.

Distinct progress has been made during the year in the more exact location of earthquake epicentres. This is due partly to advances in technique made by the staff and partly to a gradual improvement in equipment and in the more exact timing on records. Much interesting information is emerging regarding the nature and origin of our local earthquakes.

A considerable number of scientific papers were published during the year by the Observatory staff.

During the year proposals have been framed, in co-operation with the Royal Society of New Zealand and the Wellington City Council, for the establishment of an astronomical observatory with contributions from the Carter Bequest to the Royal Society of New Zealand, the Wellington City Council, and the Government. The proposed observatory will take over the astronomical research formerly carried out at the Dominion Observatory.

The data on the seismicity of cities, towns, and districts in New Zealand which have been assembled by the Dominion Observatory are proving of considerable value in the framing of building regulations and in connection with the development of standards for building-materials.

PLANT RESEARCH BUREAU.

The co-ordination and reorganization of plant-research activities in the Dominion under a newly-created unit of the Department—the Plant Research Bureau—has made very rapid progress during the year, and the new Bureau is now in effective operation.

The main plant problems have been reviewed by the Advisory Committee of the Bureau, comprising representatives of the Departments of Agriculture and Scientific and Industrial Research, Massey and Canterbury Agricultural Colleges, and the Cawthron Institute, with a view to deciding upon the best methods of attack and the most efficient use of resources available.

The four main divisions of the Bureau, dealing with plant diseases, grasslands, agronomy, and entomology, have been organized with due regard to personnel, location, and co-operation with existing research institutions so as to give the most effective service in their respective spheres.

The Plant Diseases Division has been located at Mount Albert, Auckland, on an area which from the point of view of diversity of soil type and accessibility is admirably suited for its work. In order to make immediate provision for the requirements of the fruit industry in the Auckland Province an established orchard area at Huapai has been leased, and the trees will be available for the testing of spray materials and other investigations connected with orchard management. Good progress has been made with the study of virus diseases of farm crops, particularly of tobacco. In regard to tobacco a stage has been reached when the efficacy of control measures devised in plot trials could be tested out on a field scale.

The Grasslands Division is located at Palmerston North adjacent to Massey College, and has the advantage of working in close association with that Institution. In connection with the pasture survey of Hawke's Bay, which is proceeding as a unit of the land utilization survey of that district, a novel and useful technique of pasture mapping has been devised. In addition to the work of selection and breeding of pasture plants, which is carried out in the closest association with the Fields Division of the Department of Agriculture, the Division is associated with the Dairy Research Institute and the Fields Division in studies on the cause of feed taints in dairy produce.

The Agronomy Division is located at Lincoln, thus enabling close association with Canterbury Agricultural College and the Wheat Research Institute. The work of the Division in connection with the selection and breeding of field crops is producing valuable results. The advance made towards the production of a smooth-coated pea for canning purposes may be mentioned by way of example. Trials of fibre-producing linseed of the Liral Crown variety have indicated that distinctly promising yields of good-quality flax can be grown in New Zealand, and this opens the way for the establishment of a new fibre industry.

The Entomology Division is working in close co-operation with the Cawthron Institute and with Canterbury Agricultural College. The parasite imported to control the white butterfly has continued to function very satisfactorily. A new line of attack has had to be adopted in regard to the control of the diamond-back moth, owing to the original parasite having been itself attacked by another insect.

The Botany Section is to be permanently located in Wellington. Its main activities have been in the study of ragwort, which is proving a serious economic problem to farmers in the North Island. A considerable amount of information in regard to the regenerative capacity of the plant has been accumulated which will have an important bearing on the selection of methods of control.

Remarkably good progress has therefore been made with actual research work, despite the interruptions incidental to bringing such a large organization into operation.

DAIRY RESEARCH INSTITUTE.

Further progress has been made during the year in the study of the control, by means of active single-strain starters, of gas-producing organisms which give use to openness in cheese. A difficulty arose, in that the starters were found to be subject to attack by bacteriophage, which caused their sudden failure, but the past season's work has provided a solution to this problem under conditions prevailing