

In the organization of researches the Council and Department have been fully alive to the necessity of co-operating with all Government Departments, Universities, and organizations already carrying out work in any particular field. In this regard it is pleasing to record the good general relations that exist; and I feel it my pleasant duty to express the Council's hearty appreciation of this co-operation and its gratitude to all concerned. During the year the value of this scientific team-work has been definitely apparent, and an endeavour has been made to promote direct free technical discussion of problems between scientific workers in different branches, institutions, and Departments. Very many cases during the year could be cited of the mutual help of real value readily given by all workers; and this is especially necessary in New Zealand, where small numbers of trained specialists are available. In this connection, the gathering-together in August, 1929, of all New Zealand scientists engaged on dairy-products testing and investigation should be productive of the best results.

As a result of the Imperial Agricultural Research Conference and the activities of the Empire Marketing Board, there has been considerable advance during the year in the linking-up of Empire research facilities, particularly in the primary industries. To take full advantage of these proposed schemes it will be necessary for New Zealand to financially contribute to the various research bureaux and information services set up as a result of the Imperial Agricultural Research Conference in 1928, so that it may take a fair share in research proposals, thus saving New Zealand much unnecessary repetitive research work, as well as indicating worth-while work, application, and local investigations, and helping to cut down to a minimum the period between discoveries elsewhere and their application in New Zealand. The British Department of Scientific and Industrial Research also has assisted, particularly in the direction of fuel, wool, and wheat researches. The Australian and Canadian Research Councils also have cordially co-operated, while the Bureau of Standards and the National Research Council in the United States have made every effort to answer inquiries and undertake work on our behalf.

The patenting by a United States research organization of the production of vitamin D by irradiation of certain compounds with ultra-violet light has raised the question of policy in regard to patenting of discoveries or suggestions of research officers. Hitherto, the policy of full publication of results has been followed, with little or no thought to patenting. It appears desirable, however, that, in the public interest, in many cases patents should be taken out in order to prevent fraud by those who exploit these results without giving the necessary scientific service. It is not suggested that profits from patents should be made in New Zealand, but that reputable companies be freely licensed to use patents, provided a genuine service is safe-guarded. This principle was followed in Canada in connection with the discovery of insulin in a laboratory supported by public funds.

During the past year the Secretary paid a brief visit to Canada and the United States for the purpose of studying organization of research and Government scientific services, and gleaning information on some of the problems before the Department.

Brief summaries of the various activities follow. Fuller reports by heads of branches are given later.

#### DOMINION LABORATORY.

It is pleasing to record a successful year's working of the Dominion Laboratory and its branches at Auckland, Christchurch, and Dunedin.

The Dominion Laboratory carries out the analytical and chemical work required by all Government Departments, with the exception of the Department of Agriculture. Owing to the increased degree to which chemical problems are entering into departmental and industrial questions, these services are yearly becoming of greater importance. For the successful administration of many Departments, and for the national interest generally, it is essential that the services of highly qualified chemists should be always available. The wide and varied nature of the problems that occur during the year require laboratory equipment of a comprehensive nature and a staff qualified to deal with chemical and analytical problems covering a wide range of subjects.

A number of Government Departments continually draw on the services of the Laboratory, the principal among these being Customs, Health, Police, Industries and Commerce, Post and Telegraph, and Public Works. In addition, the aggregate total individual inquiries made by other Departments also is large.

The staff and equipment complement of the Laboratory enables a maximum of organized scientific service to be rendered, and in addition to the ordinary routine work a considerable amount of research work into national problems has been initiated. Included in these is the extensive investigation into the incidence of goitre in New Zealand, carried out in collaboration with the Department of Health. A report on this work has been completed for publication. In this connection iodine determinations from soil and water supplies have been made over a number of selected areas in the Dominion, and these analyses have been associated with careful examinations by the Health Department of the school-children of these districts.

In association with the Geological Survey Branch a series of special investigations into the gold and silver content of sinters located in the Rotorua and Taupo districts has been completed. The technique of this work called for special manipulative skill.

It is the policy of the Laboratory not to undertake commercial analytical work unless such can not be carried out by private analysts. However, where the national interests are at stake—as, for instance, the possible development of new industries and utilization of waste products—investigations often are conducted by the Laboratory.

During the year work in this connection has been carried out in regard to bacon curing and wrapping, disinfection of meat-works, chemical and physical treatment of flax-fibre, manufacture of roofing-tiles, manufacture of soap, sand for glassmaking, tar for roading, water for industrial purposes, and zinc-plating. In addition, advice has been given in the numerous cases of inquiry from industry, and this service is being increasingly appreciated and taken advantage of.