DOMINION LABORATORY.

The growing appreciation of the value of scientific services is shown in the increasing demands made upon the staff and facilities of the Dominion Laboratory.

During the year the actual number of samples dealt with was only slightly in excess of the previous year, but considerably more work of an advisory nature was undertaken.

One of the aims of the Laboratory is to ensure that, while all members of the staff have a wide general knowledge, each officer shall be a specialist in some particular branch of chemical work. The experience of the last few years has fully justified this policy, as the Laboratory has been able to meet successfully a wide range of problems submitted to it for investigation.

The testing of supplies for Government Departments is one of the chief activities of the Laboratory. Almost every Department makes extensive purchases of various materials during the year, and it is important to ensure that all these materials possess the requisite qualities. This work is of a highly important nature, as the two following examples will show:—

The very large quantities of bitumen employed in modern roadmaking must comply with rigid specifications, and the road, as laid down, must contain the correct proportions of carefully graded rock, sand, &c., usually known as "filler." The use of faulty materials or incorrect mixing leads to grave risk of breakdown of the roads under service conditions. All supplies, therefore, as well as the road mix actually laid down are tested regularly in the Laboratory. In this way, too, knowledge of highway-construction, the durability of various ingredients under different conditions, and the correct procedure to be adopted in establishment and maintenance is being extended regularly.

A large amount of solder and jointers' metal is used by the Post and Telegraph Department in their telegraph and telephone work. Many of the joints made are underground or in other comparatively inaccessible positions, so that repairs in case of failure are troublesome and expensive. Consequently the solders are regularly analysed, and any showing definite impurity are rejected.

In the search for petroleum it is important to ascertain the nature of the gas which rises up in the various bores. Careful analyses were made during the year of gas from several bores in Taranaki and East Coast districts, but in no case was there any indication of the association of petroleum with the gas.

Complete analyses of various pumice-showers have proved of great assistance in the investigation of the deteriorated soils of Mairoa.

The Laboratory examines a wide range of foodstuffs for the Department of Health. During the year a special investigation was made of the occurrence of lead in soda-water. As a result, metal containing lead and joints made with solder are not permitted in soda-fountains. In this way the public is protected against injury to health likely to arise from the consumption of harmful foodstuffs or the utilization of substances whose composition may in any way affect the health of the user.

The Laboratory also renders expert service to industries, especially where there appears possibility of promoting the extension of use of supplies of raw materials for manufacture. In addition, preliminary investigations are made in those directions where industries may utilize to a greater extent modern scientific developments. As examples of this work may be quoted a series of investigations made on the properties of New Zealand clay deposits with a view to their use in the manufacture of roofing-tiles. At the same time the question of blending different clays in ways most appropriate for the preparation of bricks, tiles, and pipes was tried out experimentally and manufacturers advised as to the best proportions of the respective clays to be used.

In order to make available to the bacon industry the latest scientific developments in curing methods, factory sanitation, and to give manufacturers and farmers some idea of the influence which feeding and processing exerted upon the final product, one officer was seconded to deal thoroughly with the technical side of the industry. Several reports have now been published dealing with these aspects of the industry.

It has been the policy of the Laboratory to utilize the best methods of technique, and to examine and improve upon standard analytical methods wherever possible. In general, it may be said that very considerable changes and improvements are now being made in technique from year to year in all parts of the world. The importance of this matter in connection with examination of dairy-produce is of great moment in New Zealand. Consequently the Laboratory was represented at a meeting of dairy chemists held at Massey Agricultural College during the year, when methods of analysis were fully discussed and the adoption of standard methods agreed upon.

A major line of research, dealing with the relation of iodine to goitre incidence in New Zealand school-children, was continued in co-operation with the Department of Health during the year. The iodine contents of soils and waters in certain typical districts was ascertained and correlated with the incidence of goitre in the school-children in these areas. The results have been published in Bulletin No. 18, "Goitre in School-children." The investigation is being continued, and may have an important bearing on the elucidation of the involved problem of endemic goitre.

METEOROLOGICAL OFFICE.

The Meteorological Office has two principal functions. The first is the collection of statistics regarding the weather of the past, that sum of weather experiences which together go to make up our climate. Every individual forms from his own experiences and what he has learnt from others an idea of his local climate, and in the past it was on such estimates that human activities, especially those of the man on the land, were based. But human impressions depend upon many factors, and human memory is short. We constantly hear complaints that the climate in a particular district is changing; that certain winds have never been so persistent before; and so forth. The apparent change in climate is frequently due to the individual's increasing susceptibility to cold as his age advances. And, generally, it is found that precise records from standard instruments, so exposed