The Dominion Laboratory is performing very essential and important services in testing a great variety of materials used by Government Departments—*e.g.*, Post and Telegraph, Public Works, Housing—with a view to determining whether they comply with specifications, and giving advice in cases where difficulties have been experienced in their use. A wide range of building-materials have been examined for the Housing Department, for example, and regular analyses of paints and paint materials used in housing contracts for the Government have been carried out.

In co-operation with officers of other branches of the Department and of other Departments, it has been decided to organize this work on more constructive lines in relation to the study of building-materials of the Dominion and problems related thereto. For example, exhaustive tests of the physical properties of pumice concretes of various mixes have been made, as well as an investigation of the effects of pozzolanic ingredients in concrete mixtures. The investigations of bricks, paints, and paint materials are also being extended.

Special investigations carried out in connection with the deposits of clays, bentonite, and diatomaceous earth in New Zealand, with a view to assessing their value for commercial uses, have shown that deposits of these materials in certain areas are of high quality. Purchases of some of these materials have been arranged.

Experiments on the curing and colouring of lemons are now nearing completion. Much useful information has emerged from this work, and the results obtained, together with the recommendations arising from them, are being made available to the citrus industry in a departmental publication.

Experiments on the gas storage of apples which were carried out during the year provided useful data for the two varieties used.

The quartz spectrograph is proving a most valuable instrument in connection with the study of a variety of problems, particularly those relating to the function of trace elements in human, animal, and plant health. An examination of a number of typical samples of pasture from selected areas in New Zealand for their content of minor elements is being undertaken in order to provide standards for comparison with areas where mineral deficiency occurs or is likely to occur. Preliminary work was begun on the estimation of trace elements in the ash of samples of milk from certain areas where mineral deficiencies are suspected to occur.

The Chemical Engineering section of the laboratory has been fully occupied during the year with the examination of the efficiency and practicability of industrial processes and machinery and in dealing with technical inquiries from industry. The examination of new or improved chemical and mechanical processes for the stripping and pulping of phormium fibre has formed an important part of the work of this section.

Kauri-gum Refining.

The reports to hand from Dr. J. Hosking, who is working in London, indicate that not only can kauri-gum refining be carried out technically and economically, but the product under service trials can find a ready place in the market if steady supplies are forthcoming.

METEOROLOGICAL BRANCH.

The principal concern of meteorological institutions in recent years has been the provision of the services required by the rapidly expanding civil and military air services. This has been as much the case in New Zealand as elsewhere. While the new demands have been anticipated as far as was possible by the international meteorological organizations, and the machinery devised by them needs only to be put in operation, the provision of the personnel required has been very difficult. This has been particularly the case in English-speaking countries, because very few of our academic institutions offer a training in meteorology. It must, however, be borne in mind that the intense study of climate is becoming of continually greater importance in relation to production and industry as these become progressively developed more and more on scientific lines.

The prospective development of regular trans-ocean airways has meant that the responsibilities of official meteorological services are not confined to their own countries, but extend over the surrounding seas. The weather over the ocean will have to be studied with practically the same detail as over the land. This will obviously involve much closer co-operation between the countries bordering the oceans and from shipping than in the past. In order that the necessary co-operation between the various governing authorities in the south-west Pacific might be arranged, it was clear that the meteorological institutions concerned should confer. The New Zealand Government therefore authorized the calling of a Conference at Wellington. This Conference, which is referred to more extensively in the Director's report, proved to be very successful. The organization required to meet the demands of aviation in the south-west Pacific was defined and the machinery for its development specified. It now remains for the various countries to implement the resolutions of the Conference. So far as New Zealand is concerned, much preliminary work has been accomplished, and it is anticipated that the development of the meteorological services will lag little behind that of the airways. The most important item in the meteorological organization is the provision of the extensive means of radio communication required. In this direction the Meteorological Office has received every assistance and sympathy from the Post and Telegraph Department and the Aeradio Committee.

The network of both rainfall and the more complete climatological stations has been further improved. The increased susceptibility of the country to flooding owing to the depletion of the forest covering and the disturbance of the soil will lead to increased demand for rainfall statistics.

Attention is called to the publications of the Meteorological Office, which the nature of numerous inquiries show to be insufficiently well known to the public. In them will be found much information regarding the climate and weather of the country.