

## CHEMISTRY SECTION.

### REPORT OF THE CHEMIST.

The Director-General.

Wellington, 16th May, 1919.

I FORWARD herewith the annual report of the Chemistry Section for the year ended 31st March, 1919.

B. C. ASTON, F.I.C., Chemist.

The difficulty in carrying out the work has been increased owing to the conditions prevailing due to the war, the influenza epidemic, and the shortage of shipping.

#### SOIL INVESTIGATIONS.

Several visits have been paid to the Department's Weraroa Farm and the Manawatu district, and samples of soil collected from every type possible have been received at the laboratory for analysis. The soils of the Weraroa Farm have been sampled in detail from each paddock. A number of soils collected in the district were in connection with the "yellow-leaf" disease in flax. This disease, after waxing in importance, appears now to be waning with equal rapidity.

The Gisborne flats, at Poverty Bay, were visited in April, 1918, in answer to a request from the Poverty Bay branch of the Farmers' Union. Officers of the union had previously decided what areas of country were typical of the district, and samples of soil were drawn from these and analysed. The results were published in an article in the *Journal* for October, 1918, entitled "Notes on some Poverty Bay Soils." The fact is brought out that the River Waipaoa brings down large quantities of silt which contains an appreciable quantity of carbonate of lime, and hence when the river floods, as it frequently does, the land is improved in lime-content although crops may be destroyed.

The soils from the Stanley Brook district, Nelson, which also had been visited at the request of the local branch of the Farmers' Union during the previous year, were analysed. The results showed that all the soils would probably respond to liming at the rate of 2 tons of carbonate of lime per acre.

Applications for soil investigations to be undertaken were received during the year from the North Auckland Development Board, Kaitaia (March, 1918), and the Oparure (Te Kuiti) settlers (February, 1919). It will probably be found possible that some assistance may be given in soil-survey work by the Thames School of Mines, the Director of which has conferred with the writer on the matter.

While it is intended to deal with applications for soil research strictly in the order in which they are received, a complete soil-survey of the whole Dominion has been commenced. It will be continued as soon as the working staff is sufficiently strengthened by the return of officers from abroad.

*Abnormal Soils.*—A sample of soil from the Ida Valley, Central Otago, was received from the Public Works Department in connection with the irrigation-work being carried on there. The sample was a scraping of a white efflorescence of the surface. It was found to be similar in composition to other samples previously analysed from the Maniototo Plain containing 2.7 per cent. of soluble salts, of which 2.1 was sodium sulphate (Glauber salts) and 0.6 per cent. sodium chloride. The former constituent has also been found in the estuarial muds of the reclaimed land near Invercargill. This is probably due to the interaction with the sodium chloride of the sea-water and the sulphides of the silt after oxidation.

*Siliceous Earths* similar to diatomaceous earths recorded in last report have been sent in from localities near Wairama Run, Morrinsville; and Whangapoua, Hauraki Peninsula.

#### LIMES AND LIMESTONES.

About the same number of limestones and limes have been analysed as in the previous year. An interesting feature was the number of soft samples which, if present in suitable quantities, could be applied to the soil direct without any intermediate grinding or other treatment, in the same manner in which chalk is used in England. Samples from Whetukura, Ormondville (86.5 per cent.), Ohutu (96 per cent.), and Mauriceville were sufficiently pure and fine to ascertain their value for putty-making, putty-powder being now generally imported. But only one of these showed sufficiently good results to warrant further trials, and these will be carried out if a supply of the material can be obtained. Samples of soft limestone (85.5 and 87.5 per cent.) were also received from Gladstone, Wairarapa, and these could similarly be used on the land without any previous treatment. Another source of cheap limestone is the screenings from limestone-quarries, for which the Railway Department charges private individuals 2s. per yard (approximately 1 ton) on truck at the quarry. A truck holds a maximum of 6 tons, and the haulage of the truck from the main line at Te Kuiti is 3s. per truck. The crude limestone is not carried free for the first 100 miles as commercial lime is