

Maniototo Plains.—A survey of a part of the Maniototo Plains which it is proposed to irrigate was commenced for the Public Works Department on a scale of 20 chains to an inch. Soluble salt has been found in some soil types. Chemical tests show that it varies considerably both in quantity and type, gypsum, black and white alkali, and common salt having been found. Since a knowledge of the source and occurrence of the salt is essential, a temporary laboratory has been set up at Ranfurly to keep in close touch with the field side of the survey.

Miscellaneous Surveys of several small areas were undertaken.

SOIL CHEMISTRY

Chemical work for soil surveys has continued to be the main activity of this division. A district chemist has been attached to each of the five soil districts of New Zealand. These chemists work in close collaboration with the pedologists and deal with chemical problems as they arise.

For the Canterbury plains and downlands survey a large number of analyses have been compiled and collated with field data, and detailed investigations are in progress on selected Canterbury and Wellington soils and on the salt-bearing soils of Maniototo Plains. As this work is an integral part of soil surveys, some of the results are mentioned above under the appropriate surveys.

Clay Minerals.—Good progress has been made in applying x-ray techniques to the study of clay minerals. In addition, a second method, that of differential thermal analysis, has been started, and the two combine to give a reliable picture of the types of clay minerals in different soils. Much of the work this year has been concerned with compiling a set of analyses of type clay minerals for comparison with those from New Zealand soils. Investigations are now being made into the genetic differences in the yellow earth group of soils.

Soil Phosphates.—Work in this subject has been concentrated mainly on the measurement of phosphates absorbed by the soil clays. Difficulty has been experienced in separating the absorbed inorganic phosphates from those contained in soil organic matter.

Soil Corrosion.—There has been much activity in this section of the work. Not only have surveys and analyses been made of the soils of proposed pipe-lines at Thames, Lake Alice, the second part of the Wellington line, and at Cherry Farm, Otago, and advice tendered on protective measures necessary to reduce the corrosion of pipe-lines, but also research is in progress on the correlation between the corrosion of iron plates and analytical tests made on the soil. In this latter investigation considerable assistance has been given by the New Zealand Institution of Engineers, who laid down some thirteen years ago a series of uniform iron test plates. High acidity, low resistivity, differential aeration, high moisture-holding power of the soil, and the presence of an aerobic bacteria have been noted as some of the factors in corrosion. In the investigation of bacterial corrosion the assistance of the mycologist, State Forest Service, is appreciated.

Hokowhitu Plots.—A paper has been published showing how treatments such as ammonium sulphate, designed to give a good, hard-wearing brown-top - chewings-fescue turf, have affected the soil properties. Successful treatments have the effect of reducing the lime content of the soil, in contradistinction to normal agricultural practices, which seem to increase the lime content to favour a rye-grass - white-clover sward. This work has been applied recently in a regrassing programme for part of the Wellington Racing Club's course at Trentham.

Chlorosis in Apple and Peach Trees.—Chlorosis in the leaves of fruit-trees in orchards at Hastings is considered, from field and chemical evidence, to be due to overliming. In conjunction with the Plant Diseases Division, an experiment is in progress for reducing the alkalinity of the soils.