

Tests were also undertaken with D.D.T. for control of cockroaches in infested hotel and camp kitchens. Applied as a 5 per cent. dust in clay, adequate control was secured.

(d) *Penicillin*.—Preliminary work is being undertaken in production of small experimental quantities of penicillin from cultures of the fungus *Penicillium notatum* secured from British and American sources. The standard technique employed in testing for percentage yield has been used in the laboratory. Work is also proceeding to ascertain the effects of this and other antibiotics in control of plant pathogens, and in endeavouring to ascertain if any of the latter produce such substances.

(e) *Experimental Farms*.—Owairaka: Work during the year has been handicapped by staff shortage. A new insectary was completed during the year, and is being used in timber-protection investigations. Work is being commenced on a further lean-to type glasshouse. The unusually wet season has favoured growth of fruit-trees and shelter-belts, but has increased the amount of work required to keep weed growth in check in the numerous experimental plots. Approximately 50 tons of manure were secured from a city racing stables; part was used for manufacture of compost required for glasshouse soils, the remainder incorporated in lighter parts of the farm soils with marked benefit. Both areas are handicapped because of lack of a suitable tractor, so that most cultivation has had to be done with a rotary hoe, which, though suitable for small areas, is inadequate for present farm requirements.

Oratia: All young plantings of apples, citrus, and peaches are making excellent growth. Drainage of main blocks has been completed. Pipes have been laid from the stationary spray plant so that new plantings can be sprayed. Establishment of new shelter-belts will be completed during the winter.

SOIL SURVEY DIVISION

Soil survey investigations are undertaken by the Soil Survey Division (Dr. L. I. Grange, Director) and by the Cawthron Institute (Sir Theodore Rigg, Director), (see p. 40).

SOIL SURVEY DIVISION

General Survey, North Island.—As a result of further surveys it has been possible to add corrections to the soil map of the North Island. The maps are now being printed. An article entitled "A Basic Scheme for Land Classification" published in the *Journal of Science and Technology* contains information on the lime requirements and general fertility of the North Island soil groups and indicates what further surveys are required to produce a satisfactory land classification.

General Survey, South Island.—In the South Island the chief districts which have been mapped for general survey purposes are Marlborough and the West Coast. In Marlborough the area between the Awatere River and Ward and extending from the coast up to the margin of the high country was covered and the broad soil types separated. The soils are podzolic. The chemical analyses show that the soils are fairly well supplied in lime, but are very low in phosphate except on the terraces of Awatere River near Seddon.

In the Westland district the principal soil types of the valleys of the Grey, Teremakau, Arahura, Hokitika, and Totara rivers and intermediate coastal areas were mapped on a scale of 4 miles to an inch. The most important soils agriculturally are the river flats, and these cover approximately 70,000 acres. Unlike many of the river flats of the east coast and of the North Island, they are deficient in lime and need about 2 tons per acre. The available phosphate in these soils is generally high. There are approximately 350,000 acres of terrace land in Westland and the soils are all strongly leached—50,000 acres are well-drained soils which need heavy dressings of lime and light dressings of phosphate; the remaining 300,000 acres is wet pakihi land which needs drainage in addition to heavy applications of lime and phosphate. These are problem soils. Minor elements are also likely to be in short supply on these leached soils.

North Auckland.—A set of ten maps covering North Auckland Peninsula on a final scale of 2 miles to 1 in. are being prepared for publication and are being drafted by the Public Works Department, Whangarei.

A complete legend covering the types used has been prepared and parts of the bulletin sketched out.

Whangarei County.—A map of the county on a scale of 1 mile to the inch has been prepared for publication.

A holdings map on the same scale has been prepared from county data. Both these maps have been used by Dr. Hamilton as a basis for producing his various land-utilization maps.

The writing of the Whangarei bulletin, which will be published in co-operation with Dr. Hamilton, is well under way.

Mid Hawke's Bay.—A bulletin dealing with the soils of mid Hawke's Bay is in course of preparation.

Geraldine County.—The detailed survey of the alluvial soils of the Geraldine County was extended from the southern border north to the Orari River. The soil pattern is complex and mapping necessarily very detailed. The soils are derived from a mixture of loess and greywacke waste and include some of the most fertile soils of South Canterbury.

Ellesmere County.—Field mapping on a scale of 40 chains to the inch and analyses of the main soil types have been completed in the Ellesmere County. The soils are alluvial and resemble somewhat those of Geraldine County.

High Country of the South Island.—The bulletin on soils and erosion in the high country of the South Island is in the press and will be issued within a few weeks.

Soil Erosion Experimental Plots in High Country.—Further experimental plots to determine the effects of spelling, and to observe the results of sowing introduced plants, were established in the high country. Three of these were sown with a selection of introduced grasses and herbaceous plants supplied by the Botany Division. Careful analyses have been made of specially selected soil samples from the plots, and these should form the basis for assessing in five or ten years the changes conservation practices have induced.

Soil Erosion, South Canterbury Downlands.—A survey for the South Canterbury Catchment Board has been commenced of the erosion following ploughing of the steeper portions of the Downlands.