

The Ohakune soils are rather similar to the Taranaki soils, but show lower phosphate and rather lower percentage base saturation. Their carbon and nitrogen figures are of the same order as the Taranaki soils and higher than those of the Hutt or Manawatu. They are slightly inferior to the soils of the two last-mentioned districts in respect of phosphate and base saturation.

SOILS FROM LAND-DEVELOPMENT PROJECTS.

The projects from which soil samples were received were Matakaoa County, Wairakei-Taupo blocks, and the Mission Block (Manakau Harbour).

The Matakaoa County soils exhibit a fairly wide range in natural fertility. Phosphate figures are in general low, but potash is generally satisfactory. Some low base-saturation percentages were found and exchangeable magnesium in some cases reached a low level.

Wairakei Taupo soils are moderate in phosphate, low in potash, of low base-saturation, and of moderately acid reaction; C/N ratios tend to be high, and the texture corresponds to coarse and medium sands.

The noticeable features of the Mission Block soils are very poor phosphate content, low base-saturation, and magnesium bordering on low values.

pF MOISTURE CURVES FOR WAIKATO SOILS.

The pF moisture curves, from which the permanent wilting-point of soils can be determined, have been obtained for some Waikato soils.

METHOD FOR DETERMINING TOTAL NITROGEN IN SOILS.

A modified micro-technique has been adopted since it has been found to give entirely satisfactory results with a great saving of time.

DETERMINATION OF MAGNESIUM.

In collaboration with the Soil Survey Laboratory, Cawthron Institute comparisons have been made of methods for determining exchangeable magnesium, using for this purpose solutions containing only calcium and magnesium salts and ammonium extracts of soils. The methods tested were (1) the standard pyrophosphate method, (2) the volumetric estimation of magnesium as magnesium ammonium phosphate, (3) an adaptation of a method for the estimation of magnesium in Portland cement using 8-hydroxyquinoline,* and (4) the 8-hydroxyquinoline method worked out at the Cawthron Institute. All have been found to give equally satisfactory results, but either of the 8-hydroxyquinoline methods is to be preferred for speed and convenience.

SOIL COLLOIDS AND PHOSPHATE FIXATION.

It has been shown (Murphy, H. F. (1939): *Hilgardia*, 12, 343) that soil colloids consisting largely of the mineral kaolinite have a high capacity to fix phosphate in a form which is not readily available to plants. Since many New Zealand soil types are considered to be of high phosphate fixing-power, it becomes of interest to find whether they contain the kaolinite type of clay. In the absence of X-ray apparatus the method employed is to extract from the colloid free iron oxides, alumina, and silica, and analyse the residue.

SOIL EROSION.

The report of the Special Erosion Committee was published during the year and attracted a great deal of attention. The Hon. the Minister directed that the findings of this report should be referred to a Special Departmental Committee for recommendations in regard to its implementation. The Departmental Committee has since met and has undertaken the preparation of recommendations concerning the necessary statutory authority required preliminary to taking active measures to combat soil erosion as it occurs in different parts of the Dominion. Reports have been prepared dealing with the extent of erosion occurring in different parts of the Dominion, and indicating action which should be taken to deal with it in each area.

MINERAL CONTENT OF PASTURES.

COBALT INVESTIGATIONS AT THE CAWTHRON INSTITUTE, 1939-40.

Sir THEODORE RICE, Officer in General Charge.

The work during the past year has covered a wide field of activities, including cobalt surveys of soils and pastures in a number of districts in the South Island; the use of cobaltized fertilizers and other cobalt-containing materials for the control of bush-sickness; the cobalt status of limestones in the South Island; the cobalt status of fertilizers; animal experiments at Glenhope, Westport, and Southland; and a detailed examination of chemical methods for the estimation of cobalt.

* U.S. Bureau of Standard Jour. of Research, (1931), 6, 413-420.