

The North Auckland survey now covers about half the province, and steps are being taken to write an account of the soils in the Whangarei County.

Other field activities included:—

- (1) *Survey of Heretaunga Plains* (by H. A. Hughes and L. Hodgson).—This was continued from last season, and the mapping of all except the old Ahuriri Lagoon is completed. A detailed account of the soils and orchards is being drafted and will be published shortly.
- (2) *Survey of about 33 Square Miles on the Western Side of Akaroa Harbour* (by C. S. Harris and A. C. Harris).—It is thought that the main soil types on the peninsula have been included in this area, and top-dressing results obtained by the Department of Agriculture in the portion surveyed can be applied by them to other parts.
- (3) *Survey of Wairua Plains, 90 Square Miles in Area* (by C. S. Harris and K. S. Birrell).—This work was undertaken primarily to provide some of the data required by the Public Works Department in their task of reporting on the feasibility of irrigating the plains.
- (4) *Survey of Pakihi Soils at Westport*, covering an area of 120 square miles (by C. S. Harris).—As is well known, the soils on the terraces rising to a height of 700 ft. above sea-level east and south of Westport are very infertile and have, in general, a pan which causes subnormal drainage. On the badly drained part development is practically limited to the experimental block of the Cawthron Institute at Sargeant's Hill. With the aid of air maps the soils have been divided into several types. From the description of the different kinds of soils, together with information prepared by other Departments, it will be possible to say which of these offer a reasonable chance of development.
- (5) *A Rapid Survey of the Pumice Soils of the Gisborne District* (by the Director, L. I. Grange).
- (6) *A Preliminary Survey of Flax Soils* (by N. H. Taylor and J. K. Dixon).

A large number of chemical analyses have been made of soils collected by the pedologists in the course of all the surveys, and these added considerably to our knowledge of the various soil types. They were carried out at Cawthron Institute by Dr. J. K. Dixon, Messrs. A. C. Harris, L. Hodgson, and L. Corder; at the Dominion Laboratory by Messrs. F. T. Seelye and L. H. Davis; and during the latter part of the year by Mr. K. S. Birrell at the Fairlie Terrace Laboratory. The chemical work at the Cawthron Institute is summarized by the Director (see p. 65.). At the Dominion Laboratory fusion analyses of soils and clay fractions were made, and at the Fairlie Terrace Laboratory plant nutrients in the soils of Wairua Plains and the Gisborne district were determined.

Two papers were published in the *N.Z. Journal of Science and Technology*: "The Soils and Agriculture of Western Samoa" (W. M. Hamilton and L. I. Grange), and "Phosphate Fixation in some New Zealand and Pacific Island Soils" (K. S. Birrell).

HAWKE'S BAY SOIL SURVEY: PROGRESS REPORT.

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INTRODUCTION.

During the 1937-38 season genetic soil types were mapped in Hawke's Bay over an area of about 1,100 square miles between Napier and Wairoa, and in the vicinity of the Wakarara Range. The total area mapped is now over 4,000 square miles, and the coming season will see the completion of the project with a rapid reconnaissance of 300 square miles of high country in the north-western survey districts, and a more detailed survey of 650 square miles near Wairoa, near Woodville, and between Weber and the coast. For the greater part of these last localities geological maps are available.

Air photographs taken by the Air Department of the district between Napier and Waipukurau have been made into mosaics, and by means of these greater detail is being added to the soil maps of the 1935-36 season. About 200 square miles of this work has been completed.

DESCRIPTION OF AREA MAPPED, TOPOGRAPHY, GEOLOGY, CLIMATE AND VEGETATION.

The geology of the area was practically unknown before the present survey, but a reconnaissance of the volcanic ash-shower region had been made for soil purposes. The Wakarara Range and adjacent rolling country form part of the topographical unit described in the last report as the *western ranges and rolling country*. Hard, highly contorted, and shattered rocks (argillites and greywacke) give rise to the ragged, steep-sided range with its slopes scarred by erosion, and in places scrub-covered. The adjoining foothills and plains, formed of ancient alluvium derived from similar rocks, are still partly covered with fern and scrub, or rarely, with small patches of forest. The natural fertility of all the soils is low except where forest formerly grew or where hills of mudstone soils are exposed.

The Napier-Mohaka district is also divided topographically into three units: (1) Western ranges and dissected country; (2) central easy rolling country broken by deep gorges; (3) coastal belt of steep country.

(1) *The western ranges and dissected country* within the area described are formed of tilted, highly-dissected beds of Tertiary sandstones, mudstones, and limestones which are coated, except on very steep slopes, with the Taupo pumice ash shower that gives rise to the "bush sick" soils of this district.