

MAIROA AREA.

In company with Mr. C. M. Wright, who had previously made a study of the stock-history of the district, visits of inspection were made to about twenty farms. A comparison of the geological data and of the stock-history led to the conclusion that the unhealthiness was due to the excessive leaching of the volcanic ash that gives rise to the predominating soil of the district. Where conditions were such as to reduce leaching or where the soil from the ash was mixed with clayey material derived from the underlying formations, the soils were comparatively healthy. Most of the evidence and the deductions therefrom have already been stated in an interim report to the Council of Scientific and Industrial Research.\*

A special study was made of Section 2, Block IV, Maungamangero Survey District, in order to assist in the interpretation of results obtained from manurial experiments and from soil and pasture analyses. As the soils of this farm show great differences and are truly representative of the district, it was decided to map it geologically in order to help place future experiments upon a sounder basis. Time would not permit of a detailed soil map being prepared, but this should certainly be done before further manurial experiments are begun.

From November to March the writer co-operated with Mr. J. K. Dixon, of the University of Otago, who investigated the lime status of the soils. Soil-samples were taken from selected localities and tested by Mr. Dixon in a temporary laboratory at Te Kuiti. The results were at first inconclusive, and in February, when Mr. T. Rigg reviewed the work, he suggested that further information might be obtained by making a more minute classification of the soils into types and subtypes. After exploring the district for a fortnight the following table was drawn up and samples collected accordingly :—

TENTATIVE CLASSIFICATION OF SOILS OCCURRING AT AND NEAR MAIROA.

Types.	Aria.	Mairoa.	Mangapohue.	Waitanguru.	Kihikihi.	Mangaotaki.	Mangatea.
	3 ft. to 4 ft. of ash without iron pan (60 in. to 70 in. rainfall)	3 ft. to 4 ft. ash with iron pan (100 in. rainfall)	Thin ash on sands	Thin ash on limestone and residual clay derived from limestone	Thin ash on greywacke	Thin ash on indurated mudstone (Jurassic)	Thin ash on soft calcareous mudstone and shale (Tertiary).
Sub-types ..	(a) Over sandstone  (b) Over limestone  (c) Over mudstone  (d) Over greywacke	(a) Over sands ..  (b) Over limestone  (c) Over mudstone  (d) Over greywacke	(a) Topsoil, ash ; subsoil, sands  (b) Soil, mixed ash and sand  (c) Soil, almost entirely sand  ..	(a) Topsoil, ash ; subsoil, residual clay  (b) Soil, mixed ash and residual clay  (c) Soil, almost entirely residual clay  (d) Soil, ash affected by leachings from limestone outcrops	(a) Topsoil, ash ; subsoil, greywacke  (b) Soil, mixed ash and greywacke  (c) Soil, almost entirely greywacke  ..	(a) Topsoil, ash ; subsoil, mudstone  (b) Soil, mixed ash and mudstone  (c) Soil, almost entirely mudstone  ..	(a) Topsoil, ash ; subsoil, mudstone.  (b) Soil, mixed ash and mudstone.  (c) Soil, almost entirely mudstone.  ..

NOTE.—It is realized that many of the types defined are very variable and that each may really form a soil series or subseries. The word “type” is applied to these groups because they are thought to be the smallest units that can be conveniently mapped.

A portion of each sample was tested by Mr. Dixon, other portions being reserved for estimation of available phosphate and for mechanical analysis. The results obtained will be submitted later in the reports of the chemists who co-operated.

A week was spent with Mr. C. Sutherland, of the Department of Agriculture, who collects samples of pasture for analysis. Owing to the complexity of the soils of the district, difficulty had been experienced in collecting suitable pasture-samples, and so it was decided to mark out definite areas on well-recognized soil-types for this purpose.

A fortnight was also spent with Mr. R. E. R. Grimmett, of the Department of Agriculture, demarcating areas for trial manurial plots. Here again the complexity of the soil cover was the main difficulty, and much careful work had to be done before strictly comparable groups of plots could be set out.

On Section 4, Block VII, Maungamangero Survey District, where experiments had been made with top-dressings of lime and superphosphate, excellent results had been obtained. In April these experimental paddocks were examined and mapped in detail in order to see how far the results obtained could be applied to the remainder of the district. A separate report on this work will be issued later.

KOPAKI AND KAHUROA AREAS.

Preliminary soil investigations have been carried out in a sheep-sick area nine miles east of Kopaki, and at Kahuroa, in the Tiroa-Maraeroa district, ten miles east of Mangapehi. These will form the subject of separate reports.

\* N. H. Taylor : “The Relation of Geology to Sheep Sickness in the Mairoa District.” N.Z. Jour. Sci. & Tech., vol. xii, pp. 1-10, 1930.