

many experimental centres throughout the country can only be rendered properly available by the execution of a soil survey in the district under consideration.

The United States stands foremost in the extent of its soil-survey activities, but in some other countries, notably Prussia, Belgium, and France, soil survey is by no means neglected. A beautiful example of the latter country's work is copied into the *Journal of the Ministry of Agriculture* (England) for April, 1920, page 57. The map is roughly on a sixth-of-a-mile-to-the-inch scale. The different geological formations are shown in different colours, and on each is inserted a parti-coloured disk-shaped portion, the colours of which correspond to the legends "organic matter," "chalk," "clay," and "sand," while the size of each colour corresponds to the proportions of those ingredients present in the soil. Another figure of rectangular shape gives at a glance the proportion, expressed as parts per thousand in the soil, of nitrogen, phosphoric acid, potash, and lime. In this map, indicating about four square miles, there are depicted four geological formations, and on them are indicated the results of eight mechanical analyses and thirty chemical analyses.

A NEW ZEALAND ILLUSTRATION, AND THE MATTER OF COST.

Applying the American method of soil survey to the lands of our Manawatu coastal area, as a hypothetical illustration, we might have—(1) The Tararua series, consisting of the soil types—gravels, river-sands, loams, and clays—derived from the greywacke rock of the Tararua Range, and combinations of these; (2) the littoral series, consisting of the dune-sands of the coastal plain, and combinations with various amounts of organic matter; (3) the Manawatu series, consisting of the clays and silts of the Manawatu River flood-plain, and combinations of these with organic matter; (4) the Otaki series, consisting of the terrace lands overlying the old Otaki sandstone; (5) the organic series, consisting of those swamp soils the peaty nature of which has dominated all other constituents.

All the rivers between Paekakariki and the Manawatu River, having their sources in the Tararua Range, would therefore deposit mainly the Tararua series of sediments, but the Manawatu River, drawing its suspended material from many other sources, and the material differing largely in nature, warrants the allotment of a different soil-series name to its flood-plain.

The foregoing is a very rough sketch of a basis for classifying the Manawatu lands. The writer has endeavoured to place the series in the order of their relative importance. In mapping the country the difficulty will be to define the boundaries where one type by admixture imperceptibly shades off into another type. The mechanical analysis has always been used by this Department in classifying soils, and was so used in the Manawatu soil investigations (see *Journal*, Vols. xx and xxi).

In 1905 more than 20,000 square miles had been surveyed by the United States Bureau of Soils, with the aid of forty-five assistants,