

MODERATELY STEEP HILL COUNTRY.

The soils of the moderately steep hill country can be divided into types similar to those described for the easy and rolling lands.

Soils on recent sand-dunes fixed by vegetation cover some 40 square miles, mainly in Mangonui and Hobson counties. These soils are light and free and dry out during summer months. In part they are used for sheep-farming, but are subject to severe wind erosion where the cover is incomplete. Until the drifting sand near the coast is fixed only a small part of this type is suitable for development. The limestone hill country (30 square miles) lies largely within the Bay of Islands County, but a further 50 square miles of closely related fertile soils cover the calcareous sandstone hills of Mangonui and Hokianga counties. These are used for sheep and cattle grazing.

Immature brown clays and clay loams cover 700 square miles of hill country, 400 square miles of which lie within the Whangarei County. They have moderately fertile topsoils, but the initial fertility is steadily lost on poorly-farmed hillsides, and there is much reversion to scrub and fern. Sheet erosion is common, and in places the country slips badly.

The grey-brown hill soils cover some 260 square miles and are widely distributed. They are less fertile than the previous types, and the reversion problem is more acute. In places sheet and slip erosion is severe, and the exposed subsoil is difficult to regrass.

The gumland hills cover 100 square miles, 30 square miles of which lie within Whangarei County. This land has little or no agricultural value and is still mainly in scrub.

Fertile brown granular clays cover about 300 square miles of the basic volcanic hills in the six northern counties. They are used largely for grazing, but a fairly large area is still in forest. In Hobson and Waitemata counties there is similar country with a somewhat lower natural fertility.

Poor granular clays cover 100 square miles of hill country, 80 square miles of which lie within Mangonui County. This type is difficult to farm owing to the low fertility of the topsoil and to the readiness with which it erodes; it should, however, be suitable for reforestation.

STEEP LAND.

The steep land is largely confined to the six northern counties, where much of it has been reserved for State forests. The soils are generally thin and, owing to the danger of erosion, are not generally adapted to farming. Some fertile areas are being successfully farmed, but much that was previously felled and grassed has now been abandoned and has reverted to scrubland.

HAWKE'S BAY SOIL SURVEY: PROGRESS REPORT.

During the 1939-40 season field-work on this project was virtually completed when, in February, 1940, the staff were transferred to general soil-survey work. Final details were added to soil maps covering about 500 square miles in Southern Hawke's Bay, and small areas in Northern Hawke's Bay were also finalized. A small area near Tautane in the south-west of the province remains to be mapped, and it has also been decided to map the Wairoa-Mahia peninsula for the final reports. The four base maps for the first bulletin which deals with Mid-Hawke's Bay have been printed, and one has already been produced in colour. The text of this bulletin is largely completed, and draughtsmen are engaged on the final maps of the southern district. Some time will elapse before the publication of the first bulletin, but the results of the work are available if required.

It is now possible to review the completed soil survey and to indicate generally its usefulness. Pasture and farm management surveys have been made in association with the soil survey, and the land-utilization survey as a whole has been aptly described as an "inventory of our soil resources." The results of the soil survey alone are reviewed here; they have been described in greater detail in earlier reports.

DESCRIPTION OF AREA SURVEYED.

The survey covered the Hawke's Bay Land District (4,500 square miles), which extends from Wairoa to Woodville and lies between the backbone mountain range of the North Island and the sea. The following major physiographic divisions are recognized: (1) Western and north-western ranges; (2) western foothills south of the Ngaruroro River; (3) coastal hill country; (4) north-western pumice country; (5) plains—(a) western plains, (b) eastern plains.

(1) *Western and North-western Ranges.*

The Ruahine, Wakarara, Kaweka, and Kaimanawa ranges are the main mountain chains. All are formed from hardened sandstones and mudstones, known as greywacke and argillites, but north of the Ngaruroro River they are covered by layers of volcanic ash, of which the Taupo pumice is most important. Forest still covers many of the higher ridges. Where it has been removed, or where the original cover was scrub and fern, heavy stocking and continued burning have initiated soil erosion. In the neighbourhood of the Wakarara Range and in the lighter volcanic ash regions many hills have reached that crucial stage where bare rock occupies most of the surface. The soils are light and well drained, and in the north are of low fertility. Soils on the Ruahine Range, however, are not quite so poor, and on a few slopes pastures seem to have been maintained under skilful management.