

The average annual rainfall is 60 in. to 70 in. spread over an average of 170 rainy days per annum. Most of the district was covered with mixed forest, kauri and rimu being generally dominant on the ridge tops, with taraire and other dicotylous trees occupying the valleys. In places, however, the kauri covered the lower country and there is evidence that in the distant past it had a wider distribution.

Most of the soils are derived from greywacke rocks, and the soil pattern is due mainly to the influences of relief and of vegetation.

The immature podsoles developed on greywacke have shallow grey-brown crumbly clay loam topsoils and yellowish-brown compact clay subsoils. They are well-drained soils and pastures on them tend to parch during dry spells. The drainage is poorer on the submature podsoles. A typical profile is: 7 in. grey structureless silt loam resting on compact grey and brown flecked clay.

The other soil types occupy only a small area and will be described in later reports.

LAND UTILIZATION.

The total area surveyed (approximately 2,000 square miles) may be classified as follows:—

	Square Miles (approximate).	Percentage of Area surveyed.
Group 1: Flat to rolling land adapted to dairying, &c.	650	33
„ 2: Moderately steep land adapted to grazing	550	28
„ 3: Land covered with problem soils	150	7
„ 4: Land too steep for permanent farming	400	20
„ 5: Land with soils unsuited to farming	250	12

In a newly settled country such as New Zealand it is often difficult to be sure where we have attained a system of agriculture that is permanent—one that gives us good use of the land and yet preserves its fertility for the use of our children. Too often young countries have found that the systems of farming they have evolved are slowly converting the land into a wilderness.

In North Auckland permanent systems of farming are being developed for the lands of Group 1, but many of the methods of farming the lands of Groups 2 and 4 (the steeper land) cannot be regarded as permanent. The danger appears to be from erosion which tends to be more active on the steeper slopes.

The soils of the hillsides were formerly in balance with the forest cover, but as soon as this was removed and the surface cover of litter destroyed erosion became active. It can be arrested to a large extent by maintaining a tight pasture cover, but so many of the swards are open and over-grazing and constant burning of second growth intensifies the condition. Top-dressing helps to close the sward, but there are many difficulties attending the top-dressing of grazing land and the assured return to the farmer is not such as to tempt him to do this on any large scale.

Much of the hill land has been cleared and grassed without a thought as to what the next step will be. Care and skill are required to maintain permanent pasture on what was once a forest slope.

The problem soils of Group 3 are mainly mature soils derived from basic igneous rocks (*e.g.*, ironstone land) and some of the peaty soils. These soils, although they have certain desirable qualities, have not yet been economically farmed. They should not be settled until sound methods of farming them have been demonstrated.

The lands included under Group 5 as being unsuited to farming are mainly eroded claystone hills and areas covered with sand podsoles. The few farmers on them have little chance of success and such areas should not be settled further. It is not in the best interests of the community to have citizens spending their lives in a more or less hopeless struggle against Nature.

SOILS OF KAITAIA DISTRICT.

By C. F. SUTHERLAND.

A reconnaissance survey of 200 square miles of the Kaitaia district was made in order to provide a basis for co-operative work with the Fields Division of the Department of Agriculture.

The assistance given to the survey by the Awanui Dairy Company, the County Clerk, and officers of the Lands and Survey Department and the Public Works Department is gratefully acknowledged.

TOPOGRAPHY, GEOLOGY, AND CLIMATE.

The district is bounded on the south by a range of mountains 1,000 ft. to 2,000 ft. high, composed of greywacke and basic igneous rocks. Five miles east of Kaitaia the range is broken by a northerly-trending valley, three to four miles wide, floored with Tertiary sandstones.

The rolling sandstone country is 300 ft. to 400 ft. above sea-level and is drained by the Takahui River, which flows northward to meet the Awanui River at the lower end of the Victoria Valley.

East and north-east of Kaitaia is a block of hill country 300 ft. to 450 ft. high and underlain by limestones, sandstones, and mudstones, and flanked on the west by flat-topped hills about 150 ft. high, carved from Pleistocene sands and older sediments covered with a veneer of sands. Between the hill country and the sand-dunes bordering the west coast the Awanui River has built a gently sloping fan of silt and clay, the lower western portion of which is covered with peat swamp.

Two belts of dunes border the coast—the inner dunes now fixed by weathering, and the seaward dunes of drifting sand.

The average annual rainfall* at Kaitaia is 55 in. spread over an average of 131 rainy days per year. The mean annual temperature at Monganui, seventeen miles east-north-east of Kaitaia, is 61.3° F.,

* E. KIDSON: Meteorological Office Note No. 17, 1937.