

pasture, it was necessary to delineate roughly on the maps certain phases or, rather, complexes, mainly composed of this type. In one such complex limestone outcrops are abundant, and the sandstone which overlies the limestone and surrounds the outcrops contains more lime, so that the resulting soil is more fertile. Again, profiles of pure pumice sands are encountered, and in some area are so numerous that a poorer phase is recognized. In the Matapiro district the normal type is most common, and this is considered to be better country (pH=6.2, percentage base saturation 71 per cent.) than that near the coast north of Napier, where the poorer phase containing numerous sand profiles is mapped.

(d) *Semi-mature* (weakly podsolized) soils have, as a rule, compact subsoils with high clay accumulation, and more free sandy topsoils. In dry weather the subsoil is a hard pan, but in wet seasons the pan does not appear to be cemented. They are best developed in the coastal belt north of Napier, where they form rolling ridges left by the close dissection of the land-mass, and in the Greenmeadows - Bay View area west of Napier where about 70 square miles have remained without important dissection. The main type is the one derived from marine pumiceous sandstones. A profile is:—

- 6 in. sandy loam (heavy), greyish-black.
- 9 in. sandy loam (heavy), creamy-grey.
- 9 in. sandy clay loam, yellowish-brown, compact.
- On pan of sandy clay loam on sandy clay, yellow.

On phases where the slope is very gentle to flat this pan forms a thick siliceous "case-hardened" band when exposed to air. The subsoil is sometimes calcareous. As a rule, the type is of fair natural fertility. Data for a typical profile are given below:—

Sample.	Locality.	Depth (In.).	Topography.	Horizon.	Stage and Parent Rock.	pH.	Available		Percentage Base Saturation.	Clay.
							Phos- phate.	Potash.		
2105 .. 2106A 2106B 2106C..	Ohit Road	0-6 7-12 13-18 18-24	Rolling to steep	A ₁	Semi-mature (de- rived from marine pumiceous sand- stone)	6.0 6.8 7.1 7.3	0.003	0.021	62.1 62.5 76.8 59.7	17.2 19.5 25.8 26.5

There is evidence of the shift of clay in the profile. Phosphate is low, but the base saturation is relatively high. Phosphate top-dressing is indicated. The rolling country in the Matapiro area twelve miles west of Napier belongs to this type (pH about 6, and percentage base saturation near 60 per cent.), and is better than the phase north of Bay View which contains numerous profiles of pumice sands.

(e) *Sub-mature and mature* (moderately podsolized) soils are fully weathered and have a dense compact clay subsoil or cemented hard pan. They are the end-product under existing conditions. They are not common in the area described, but occur in small areas on the easy rolling to flat phases of the semi-mature soil described above. These phases are well leached and have a hard silica pan which remains permanently cemented.

Certain other soils of the New Group surveyed in previous seasons include those in the Wanstead district, seven miles north-west of Wallingford, developed on moderately steep to rolling slopes derived from a heavier calcareous mudstone. Owing to the high original lime content the soils are still in the young state and relatively fertile, although for practical purposes they are not as valuable as the better-drained, warmer soils at Raukawa. Data for a typical profile are:—

Sample.	Locality.	Depth (In.).	Topography.	Horizon.	Stage and Parent Rock.	pH.	Available		Percentage Base Saturation.	Clay.
							Phos- phate.	Potash.		
2099 .. 2100A 2100B 2100C..	One-half mile south- east of Elsthorpe turnoff, Tukituki River Road	0-6	Rolling to steep	A ₁	Immature (derived from calcareous mudstone)	5.7	0.009	0.032	81.0	46.5
		8-12	”	A ₂		5.7	0.007	0.019	80.7	55.6
		13-18	”	A ₂		5.5	0.003	0.013	96.7	55.7
		18-23	”	A ₂		5.2	..	..	93.5	55.3

Phosphate is low, but the percentage base saturation is very high. The pH values are low considering the base saturation. Phosphate top-dressings are needed. A few miles east of Wallingford the Weber soil type is developed on slightly coarser rocks on gently rolling hills. Leaching has progressed to a slightly greater extent than on the Wanstead type and the soil is better drained. Similar base-saturation figures are given for this type, although the pH is higher.

The field characteristics of the soils in the Wakara district were fully described in the last annual report. A typical chemical profile for a young soil developed from greywacke on steep slopes is given below:—

Sample.	Locality.	Depth (In.).	Topography.	Horizon.	Stage and Parent Rock.	pH.	Available		Percentage Base Saturation.
							Phos- phate.	Potash.	
1945 .. 1946A .. 1946B ..	Ngamoko, west of Norsewood	0-6 12-18 18-24	Steep .. " "	A B C	Young (derived from greywacke) " "	5.6 5.7 5.4	0.009 0.005 0.005	0.015 0.011 0.004	17.8 4.4 3.0