

## REPORT ON BANKS PENINSULA SOIL SURVEY.

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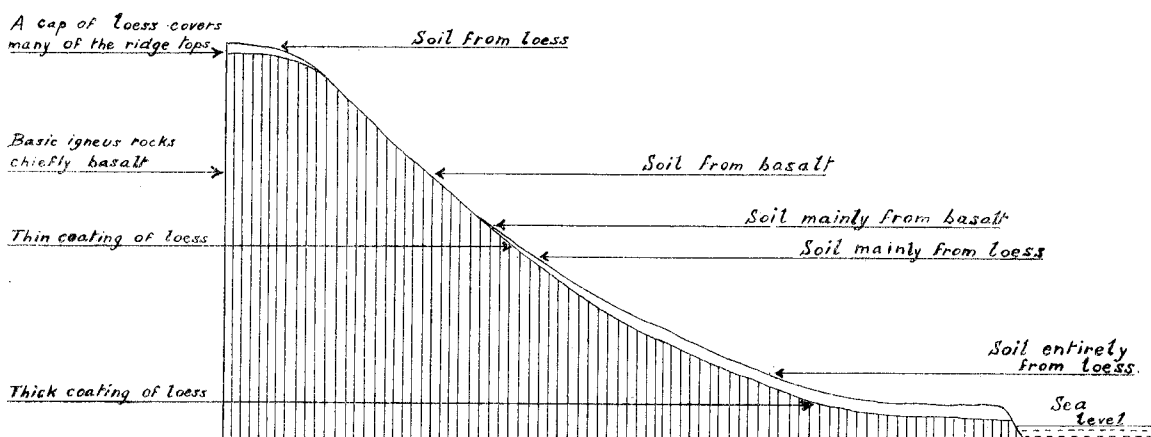
## INTRODUCTION.

During April and May of 1937 part of Pigeon Bay and Akaroa survey districts was mapped on a scale of 20 chains to an inch. The area, totalling 21,000 acres, consists roughly of the slopes on the western side of Akaroa Harbour, from Duvauchelles Bay through Wainui to Timutimu Head.

## TOPOGRAPHY, PARENT MATERIAL, RAINFALL.

Apart from small areas of flat land in the bays, the country is made up of gentle slopes near the sea merging into very steep and rugged topography near the tops, which run up to 2,000 ft. or more above sea-level. The main streams drain towards the east into Akaroa Harbour. The rainfall on the lower slopes is about 40 in. and increases with altitude.

The underlying rock consists mainly of basalt over which has been spread a mantle of wind-blown dust (loess). On the lower, gentler slopes and on the easy ridge-tops the mantle of loess is many feet deep, but over the greater part of the steep upper slopes the loess is absent. Between the high, steep basalt slopes and the low, gentle loess slopes there is a transition zone where the parent material is partly loess and partly basalt. The following cross-section of a typical hillside gives an idea of the general distribution of loess and basalt and the soils derived from them:—



*Section through hillside showing distribution of soil derived from loess and basalt in relation to topography.*

Small flats have been formed in some of the bays by loess and basalt detritus washed down from the hills above. There are also two very small strips of flat in Barrys and Duvauchelles Bays where the soils have been formed from raised sea-beaches with a thin covering of alluvium.

## SOILS.

Owing to the soils being young, the parent material is the dominant factor in soil classification; other important factors, however, are the steepness of slope and type of native plant cover.

Chemical data included in the description of the different soil types for the most part correlate well with field evidence and substantiate data that have been gained previously from farmers' and Department of Agriculture trials.

## A. Soils derived from Loess.

1. *Pawson Silt Loam*.—This type, which occurs usually on the low, gentle slopes, has a light to very dark brown silt loam topsoil resting on pale yellowish-brown silt loams. The texture is fairly free down to a depth of 27 in., where it becomes more compact. A certain amount of slipping occurs.

The original cover was heavy bush—mainly totara with some kowhai, akeake, black-pine, and white-pine. Some of the best cocksfoot paddocks on the Peninsula are on this type. At its best the pasture is composed of cocksfoot, rye-grass, and clovers; while at its worst Yorkshire fog, crested dogstail, cocksfoot, rye-grass, clover, timothy, and a little sweet vernal are the main species.

2. *Brough Silt Loam*.—The topography is the same as for Pawson silt loam, but the topsoil is black and the subsoil is not as compact, and more slipping occurs.

Very heavy kanuka (up to 24 in. to 30 in. in diameter) originally covered most of this type, although some smaller areas which carried manuka and mountain-flax are included. The pasture is very poor, being pure danthonia or danthonia with some brown-top and sweet vernal. Hair-grass, Yorkshire fog, a little clover, mosses, and flat-weed are often present also, while cocksfoot does not thrive at all. Chemical analyses indicate that the potash supply is fairly satisfactory and that there is need for lime and heavy dressings of phosphate. The figures show that lime, phosphate, and potash content is lower than that in the Pawson soil, and on this evidence indicate the need for heavier dressings.