ground subject to erosion. On the credit side was the incoming of foreign grasses and herbs of higher palatability than any members of the original pastures. Had it not been for this invasion of exotics the pastures would have been in a far worse condition at the present time.

Some time about the early "eighties" the rabbit, which had been for some years in the lowlands, crept up into the higher country. In many places, especially where the soil was sandy or silty and where rocks or shrubs were abundant, there were excellent breeding-grounds for this prolific animal. There was also food in abundance, especially in the young leaves of the fescue-tussocks after burning. On this food, under circumstances eminently suited for their increase, the few rabbits soon increased to thousands and tens of thousands. With this increase the tussocks of various kinds and all the plants at all palatable were eaten to the ground, and by degrees, in proportion to the dryness of the climate, were greatly reduced in number, so that areas small and large, according to circumstances, were turned into bare ground, or occupied by unpalatable plants. So far has this depletion proceeded in the driest area—the upper Clutha River basin of Central Otago—that from an altitude of some 500 ft. up to 2,500 ft. the country at the present time has the aspect of a desert. There, instead of waving tussocks, as in the early days of settlement, the landscape, as far as the eye can pierce, consists of bare hills looking like huge sand-dunes. A closer view reveals the fact that here and there the bare ground has become occupied by thousands of greyish or silvery circular mats of the scabweed (*Raoulia lutescens*) and its allies—plants originally of river-beds, whose seeds have been blown on to the bare hillsides and germinated. Between and upon these scabweed mats are a few indigenous or introduced plants, but mostly quite worthless for food—*e.g.*, the mountain-chickweed (*Stellaria gracilenta*) and the desert-poa (*Poa maniototo*). But a few more valuable plants have come in, especially sorrel (*Rumex acetosella*) and the winged (or star) thistle (*Carduus pycnocephalus*). It is the presence of the above two plants, together with the grasses and clovers still remaining in the gullies, and the rich vegetation of tall blue-tussock (*Poa intermedia*) at above 2,500 ft. altitude, which has kept the carrying-capacity as high as one sheep to seven acres.

So far only the causes directly operating on the pastures have been dealt with. There comes in, however, another factor, by no means negligible—the tenure, and some of the conditions of such tenure under which the land has been held. This, as has been seen in Part I of this report, we hold to have been one of the primary causes which have led to the present unsatisfactory condition of the pastures; but no further elaboration of this cause is necessary here.

To sum up the causes of deterioration and ultimate depletion of the grassland, they may be stated as follows:—

(1.) Burning the tussocks, especially at the wrong season of the year.
(2.) Overstocking with sheep.
(3.) Continuous grazing for seventy years without attempt at improvement.
(4.) Allowing rabbits to become extremely numerous. (This latter is the most potent cause of all.)
(5.) The tenures under which the land has been and is held, and some of the conditions of such tenures.

With regard to deterioration of the grasslands, it must be pointed out that the climate, in conjunction with burning, overstocking, and rabbits, is the deciding factor as to how far depletion will proceed. Thus in the extremely wet areas, though there may be great deterioration, no phase of depletion is to be seen.

Greater dryness leads to hints at depletion, but it is not until the really dry areas are visited that the maximum of depletion is apparent. In this regard that portion of Central Otago already defined has the misfortune to stand first, but there are areas in the Mackenzie country, upper Waitaki, and the Clarence and Awatere Valleys where depletion has long ago reached the scabweed stage, and where the evolution of depletion can readily be investigated.