

cash crops. Wheat became the mainstay of the small plains farmer—the tussock was ploughed in and crops were harvested year after year. As a result, soil fertility was drained away, yields declined, and the soil damage resulted. This is at the foot of many present-day problems. Gold did much for New Zealand. It conjured up population and capital. But it also left a trail of wanton destruction. Wherever the miners went with pick, sluice, and dredge, they left scars on the tortured earth, scars which breed slips and gullies to this day.

Sheep and gold weren't the only offenders. The "bush burn" farmer at least replaced the forest with grass. But the sawmiller left the land mutilated and dead. So, too, the gum-digger in the North Auckland district laid waste thousands of acres of the best timber-producing territory in New Zealand, and is largely responsible for the slow development of this district to-day.

The "bush burn" farmer in this period from 1875-90 devastated a far greater area than that touched by miller and digger—and with more ruinous effect. The process is still used in the remote backblocks: the large trees are felled, a "burn" reduces the whole area to a blackened wilderness, seed is then sown—grasses, clover, and perhaps mustard, rape, and turnips—and, the first green flame alight, sheep are turned in to tread down the seed-bed and chew out the bracken and second growth. Most of New Zealand's famous grass-lands have been brought into being by this brutal method.

In 1882 the first ship, weighted down with frozen mutton and lamb, arrived in the Thames estuary. By 1895 refrigeration had come to stay, and this practice opened a new field for agriculture. The small dairy-farmer took his place alongside the squatter, and for the first time the North Island exceeded the South in population. The new development affected the natural vegetation cover in various ways. Bush-burning and fern-crushing were extended, 14,000 square miles of forest being put to the fire, sometimes in places where soil stability seems impossible if the soil is not held together by forest. Swamp areas were drained and became some of the most

productive land in the country—*e.g.*, the Hauraki-Piako lowland and the Manawatu-Horowhenua area. In the South Island a mixed arable economy flourished, with farms of moderate size, and shelter-belts and wind-breaks making a patchwork of the plains. In conjunction with this more intensive farming has come the practice of artificial fertilizing, which is doing much to restore the soil fertility lost in the old days.

To-day thirty-two million sheep and almost five million cattle browse where once was forest. From these, directly or indirectly, all New-Zealanders make their living.

In spite of the intensive development of the last hundred years, there are still three pioneer fringes against which the forces of civilization are steadily moving. In North Auckland the gum country is being reclaimed and grassed, though the struggle against the stiff clay soils is an uphill one. In the central North Island plateau, afforestation, tourist traffic—*e.g.*, Rotorua—and its development as a dairying area have done much to increase its population. In Westland a bitter struggle is being carried on against dense pine forest and the water-logged, sour soils. Timber-milling and beef-cattle raising are gradually opening up the country as far south as Jackson's Bay.

Having surveyed the natural vegetation, it now remains to look at the replacements man has made, and also to observe the way Nature is revolting against the change.

The vegetation covering the greatest area is grass-land, native and exotic; 17,000,000 acres are in artificially sown pasture and 14,000,000 acres in tussock. Together these make up almost half the total area of the Dominion. These grass-lands embrace several types.

The first class, the high-producing pastures for which New Zealand is famous, is comparatively limited. Usually they are reclaimed swamps and are consequently well watered, with mild winters. They are ideal for small dairy holdings aiming at butter, cheese, and domestic-milk production. Usually such farms are divided into small fields of rye-grass and white