EXPLORING THE PLANTS OF STEWART ISLAND.

by Hugh Wilson.

Half forgotten, tucked away at the southern end of the much larger Middle Island of New Zealand, Stewart Island has several things that make it a magic place for me. Though it is by no means immune to their prying, progress and development have largely passed it by. It is still part of old New Zealand.

True, deer and opossums have seriously damaged the forests in many places, and birds like kokako and brown teal have either vanished or barely linger on. But the pattern of vegetation is primitive still, and kiwis shuffle and probe through it, startling the night air, and sometimes the daytime air as well, with their extraordinary cries. There are not many places in New Zealand now where the canopy of trees is cheerful with the chatter of kakariki (parakeet) or bustling with the impulsive energy of innumerable tuis and bellbirds. Also, along a coastline hundreds of kilometres long, this wild New Zealand meets an even wilder sea, home for countless millions of seabirds and a variety of marine mammals.

Fresh from the very different environment of Mount Cook National Park, I was set to work to explore the botany of this magic place. Of course I wasn't starting from scratch; that would have been an exciting but a very daunting prospect. A lot was known already about the plants of Stewart Island. Earlier botanists like Kirk and Petrie visited and collected there, describing some new species not known from elsewhere in New Zealand. Some of the European settlers, like the Maoris who preceded them, were keen observers of the plant life; the name of Traill, for example, figures in the names of several local species. At the beginning of the century Leonard Cockayne applied his inimitable powers of observation to the flora over

several weeks of intensive fieldwork; his now classic "Report on a Botanical Survey of Stewart Island" was published in 1909.

Those were signigicant years for Stewart Island plants, for three species of exotic browsing mammal had recently been liberated, Australian brushtail opossums in 1890, red deer in 1901, and whitetail or Virginian deer in 1905. Roy Traill, now one of the oldest living Stewart Islanders, remembers deer in crates on the wharf at Halfmoon Bay. Subsequently he watched some plant species steadily disappear from the island's forests, coasts and hills. Coprosma lucida and the fern Asplenium bulbiferum were among the first to be laid waste in the bush. Punui (Stilbocarpa lyallii), an extraordinary herbaceous araliad, vanished from the coastal scrub of the main island wherever the animals could reach. The southernmost population of Ranunculus lyallii, high on Mount Anglem, was heavily damaged by deer.

I suppose that to many people these are botanical details and subtleties. Stewart Island vegetation must look untouched to eyes unaware of what it would look like if no exotic mammals were influencing it. Some idea of what changes have occurred is provided by islands which are free of the browsing mammals, where the luxuriance of the fern and shrub understorey is in striking contrast to the open interior of much Stewart Island forest. Of course boat transport, and sometimes tricky landings, are required to visit these places. Permits too, in many cases. These offshore islands are not only remarkable refugia for many vulnerable plant and animal species, but also breeding grounds for the muttonbirds which are harvested by islanders with traditional birding rights. Fortunately reserves in the vicinity of Halfmoon Bay, the sole significant settlement, also provide some idea of undamaged Stewart Island bush. Here, the mere proximity and activity of human beings keeps the whitetail deer wary and partially at bay.

In some places the devastation is obvious even to

untrained eyes. The prevailing winds are westerly, and coasts exposed to the west bear extremely resilient coastal vegetation. However, parts of the coast exposed to periodic easterly storms are vulnerable to salt spray damage and here browsing appears to have inhibited the natural regeneration with disastrous results. In other places the forest has simply collapsed and vanished, to be replaced by a coarse cover of sedges, grasses, and scattered browse-resistant shrubs, studded with a few gaunt skeletons of dead or dying trees. Forest Service scientists, who have undertaken much vegetational survey work on the island, are investigating this dieback in detail, using such techniques as exclosure plots and local documented poisoning.

Browsing also seriously inhibits regeneration on slips following spells of unusually heavy rainfall. Several years ago many slips occurred, especially in the Rakeahua Valley, when waterlogged soil and vegetation slid on the underlying iron pans. Two of the species which would presumably rapidly colonise the disturbed ground, fuchsia (Fuchsia excorticata) and wineberry (Aristotelia serrata), occur as numerous seedlings but are quickly browsed. Unfortunately these species are also important sources of food for birds such as tuis and bellbirds, so their elimination is doubly unfortunate. Instead, sedges, particularly Uncinia, play a major role in covering the bare ground, and other woody species such as manuka (Leptospermum) and kamahi (Weinmannia racemosa), [and leatherwood (Olearia colensoi) and inaka (Dracophyllum longifolium) at higher levels] gradually re-establish forest and scrub.

Despite this damage, I know of no plant species eliminated altogether. (Alas, the birds have not been so lucky). There are still many places, even on the main island, where animals do not penetrate, and even highly palatable species continue to thrive.

My field assistants and I have been fortunate in having

lots of field time - many, many more weeks, for example, than Leonard Cockayne was able to enjoy. With packs, tents and compass we have been exploring the remotest corners, as well as those places more frequently visited by trampers and, of course, hunters and fishermen. Often we land by boat, occasionally by helicopter, and work our way back to so-called civilisation, sometimes for as long as 2 weeks at a time, systematically sampling the vegetation as we go.

And what a vegetation! A temperate rain forest, dominated by rimu (Dacrydium cupressinum), kamahi and rata (Metrosideros umbellata) full of bryophytes and ferns, covers much of the land surface. But contrasts are great. You can fight your way from the forest up through a dense belt of leatherwood, manuka and Dacrydium scrub into wild windswept subalpine and alpine open tops. Many of the species here, unlike the forest ones, are unique to the Stewart Island region. Or you can walk from the forests onto startling coasts - moonscapes of sand dunes, storm-lashed cliffs, wild, sweeping beaches of clean sand. Some of the species here, are also Stewart Island endemics. There is open country at low altitudes away from the coast too, some of it treacherous with deep swamps and bogs, some tawny with red tussock, much of it a heath-like mosaic of fire-modified manuka, wire-rush and tangle fern (Gleichenia). Often the streams give access to the interior: you can follow the larger ones by boat through the overhanging manuka and forest; further in these are fed by fast-flowing streams in mossy granity beds: sometimes you will be startled by rounding a bend onto an impressive cataract.

It is true that often the skies above are grey and as likely as not it will be raining! But the island is not mean about fine, clear days too, and the best of these are wonderful. If, on one of them, you are high above the forest, looking westward from the tops of Anglem, Rakeahua, or the Tin Range, you will see the Solander islands floating on the horizon across 70 km of sea, like something out of

Tolkien.

So far we have documented a flora of some 570 native vascular species, and some 130 adventives, mostly restricted to sites disturbed by human activity. All of these are depicted in the field guide which will be the first major publication resulting from this work. This total is exceeded by the number of bryophytes - liverworts and mosses - and lichens: only a selection of these can be shown in the guide. I decided a Stewart Island guide which ignored the seaweeds deserved to be thrown in the sea, so with the help of Murray Parson, Graeme MacRaild and Eileen Willa I sketched about 20 of 400 or so known species of marine algae from the coasts. Alas, the fungi will receive an even more cursory treatment, better than nothing though, I reason.

Understanding the flora is one thing; understanding the vegetation is another. Stewart Island raises many intriguing questions. Why is there no beech (Nothofagus), no kowhai (Sophora), no celery pine (Phyllocladus), no cedar (Libocedrus)? Why are most of the endemic species in the uplands? Why is the flora of Mt Anglem so different from the flora of Mt Rakeahua and the Tin Range? Why does manuka appear to dominate in climax vegetation at mid-altitude?

If it is magic to explore Stewart Island by foot, sharing it for awhile with the kiwis, kakapos and parakeets, it is magic too to explore the mind for solutions to these queries. Botany can be indeed a marvellously engrossing and exciting pursuit, whether explored in the Stewart Island wilderness or in our own backyards. We can take plants for granted, but they are always with us and we would perish if they were not.