

big trees; supplejacks (*Rhipogonum scandens*), lawyers (*Rubus australis*, *Rubus cissoides*, and *Rubus schmideloides*), *Parsonsia heterophylla*, *Muehlenbeckia australis*, *Clematis indivisa*, and *Passiflora tetrandra* are all seen scrambling over the lower shrubs or hanging in graceful festoons from the bigger trees.

Tree-ferns are well represented by the Wheki-ponga (*Dicksonia fibrosa*), punga (*Cyathea dealbata*), wheki (*Dicksonia squarrosa*), *Hemitelia Smithii*, and in a lesser degree by the mamaku (*Cyathea medullaris*). Among the smaller ferns are prominent the beautiful green lace of the *Todea hymenophylloides*; *Lomaria discolor*, *L. lanceolata*, *L. capensis*, and *L. fluviatilis*; the *Polypodium Billardieri*, *P. pennigerum*, *P. grammitidis*, and *P. australe*; *Aspidium aculeatum* var. *vestitum*, *Aspidium aculeatum* var. *syvaticum*; *Asplenium bulbiferum*, *A. flaccidum*, *A. falcatum*, and *A. lucidum*; and *Hymenophyllum dilatatum*, *H. demissum*, *H. multifidum*, *H. scabrum*, *H. australe*, and *H. flabellata*; some *Todea superba* are sometimes met with.

In scrub and fern openings the manuka (*Leptospermum scoparium*), mingi (*Leucopogon fasciculatus*), and *Leucopogon Frazeri*, tutu (*Coriaria ruscifolia*), houhou (*Panax arboreum*) karamu (*Coprosma lucida*), tawhiri (*Pittosporum tenuifolium*), *Veronica salicifolia*, *Gaultheria rupestris* and *G. fagifolia*, and *Cordyline australis* and *C. Banksii* form the chief trees and shrubs. At Kakahi the rather rare *Teucrium parvifolium* was found on a flat near the Whakapapa Stream. Along the stream, also, kowhai (*Sophora tetraptera*) and *Olearia nitida* are plentiful. The bracken fern (*Pteris aquilina*) abounds here in scrub country. Half-way between Kakahi and Owango the parasitic shrub *Loranthus micranthus* in two places was found growing on the common totara, a fact, I believe, not previously noticed.

A noticeable absentee from this district is the kiekie (*Freycinetia Banksii*), so common elsewhere.

The foregoing association shows little change till in the vicinity of Raurimu, 900 ft. higher, and fourteen miles farther south. Here the mountain-cedar or pahautea, locally kaikawaka (*Libocedrus Bidwillii*) and manao or silver-pine (*Dacrydium Colensoi*) appear in force among the conifers; there also come in rahutu (*Myrtus pedunculata*) and papauma (*Griselinia littoralis*); *Pittosporum Colensoi* has taken the place of *Pittosporum tenuifolium*; *Fagus Solandri* and *Fagus fusca* appear along streams; also *Coprosma tenuifolia* and horopito (*Drimys axillaris* and *D. colorata*) are some of the chief shrubs in the forest undergrowth. The tree-fern (*Cyathea medullaris*) and the supplejack (*Rhipogonum scandens*) have practically disappeared, as also have the rewarewa (*Knightia excelsa*) and titoki (*Alectryon excelsum*), or else they have become very rare. The mountain cabbage-tree (*Cordyline indivisa*) is now to be seen projecting its stately crown above the tops of *Pittosporum Colensoi*, *Panax Colensoi*, and other small trees that form the forest-margin. Mountain flax (*Phormium Cookianum*), is also a new accession to the flora. The soil in this locality is generally a light-brown volcanic loam.

As one ascends from Raurimu, rimu and matai, though still abundant, become much smaller in size. On the higher spurs near the Spiral short-barrelled totara (both the common and Hall's) and kaikawaka (*Libocedrus Bidwillii*) become very plentiful. On the Waimarino table-land a height of about 2,600 ft. above sea-level is reached. Here the forest differs largely from that at an altitude of 1,000 ft. Of the forest-trees, tawhero (*Weinmannia racemosa*) is predominant; there is an abundance of *Griselinia littoralis*, white and black maire (*Olea lanceolata* and *O. Cunninghamii*), toro (*Myrsine salicina*), and kaikawaka (*Libocedrus Bidwillii*); rimu (*Dacrydium cupressinum*) and matai (*Podocarpus spicatus*) are still plentiful, though rather stunted; the silver-pine (*Dacrydium Colensoi*) and the two totaras (rather dwarfed) are both present in fair quantity; *Cordyline indivisa* is common; *Senecio Kirkii* is seen perched in the forks of the biggest trees; the forest is fringed with a dense growth of *Phyllocladus alpinus*, *Aristotelia fruticosa*, *Panax anomalum*, *Meliccytus lanceolatus*, korimoko (*Veronica salicifolia*), *Panax Colensoi* and *P. simplex*, *Pittosporum Colensoi*, and *Coprosma foetidissima*, *C. cuneata*, and *C. parviflora*. The short and almost trunkless tree-fern (*Dicksonia lanata*) is fairly plentiful; but *Cyathea dealbata*, *Dicksonia squarrosa*, *Hemitelia Smithii*, and *Dicksonia fibrosa* are present only in small numbers; and in places the beautiful *Todea superba* is the chief covering of the forest-floor, often giving to the scene the enchanting beauty of fairyland. The undershrubs within the forest are chiefly *Drimys axillaris*, *Drimys colorata*, *Alseuosmia quercifolia*, *Coprosma tenuifolia*, *C. foetidissima*, and *C. grandifolia*, and *Myrtus pedunculata*, and *Fuchsia exorticata*.

The bush lying to the west of the railway between Waimarino and Erua Stations carries some rather rare plants—viz., *Aristotelia Colensoi*; one specimen of *Panax arboreum* var. *laetum* was found. *Panax simplex* var. *parvum*; and *Pittosporum rigidum* (here a bushy-topped tree, 15 ft. high, and with mature leaves 1 in. long) was found growing in a clump of *Olearia virgata* scrub on the Waimarino Stream; close by the latter were several shrubs of *Hymenanthera dentata* var. *angustifolia*, exhibiting, like the *Pittosporum rigidum*, extreme variation in the size and shape of the leaves; *Olearia nitida* var. *capillaris* is also found here; and in the bush the ferns *Trichomanes reniforme* and *Lindsaya trichomanoides* were seen; this was the only locality where I found this *Lindsaya*, but it probably grows on the lower slopes. The *Hoheria populnea* and *Plagianthus betulinus* (lacebarks) are here only rarely seen; tawa is represented only by occasional small specimens; *Podocarpus dacrydioides* is rare, *Cordyline australis* has only a few (but big) specimens. The lianes *Muehlenbeckia australis* and *Rubus schmideloides*, *Parsonsia heterophylla*, and *Clematis indivisa* are all plentiful.

THE WAIMARINO STEPPE.

Lying between Waimarino Station and Hauhungatahi Mountain, and trending generally in a north-easterly direction, is the Waimarino grass and shrub steppe, containing roughly some 150,000 acres of land. When viewed from Hauhungatahi this plain has the appearance of an extensive and irregular sandy desert lying spread out below the zone of forest that clothes the lower slopes of the mountain. Examined from its own surface, however, this apparent desert proves to be an extensive alternation of peaty bogs and narrow dry tongues of land. The bogs bear a vegetation composed