

mainly of *Carex*, stunted *Phormium*, *Craspedia uniflora*, *Epilobium*, *Drosera*, *Hypolaena*, *Carpha*, and *Celmisia longifolia*. The dry tongues are clothed principally with *Danthonia Raoulii*, *Poa Caespitosa*, *Hierochloa redolens* (sweet-scented holy grass, "Karetu" of the Maoris), *manao* (*Dracophyllum subulatum*), spear-grass, *Aciphylla squarrosa*, *Coprosma depressa*, *Uncinia rubra*, hawkweed, and native dandelion (*Microseris Forsteri*), *Celmisia longifolia* and *Celmisia glandulosa*, *Euphrasia cuneata*, *Viola Cunninghamii*, *Leucopogon Frazeri*, *Pimelea laevigata*, *Epacris alpina*, *Gaultheria antipoda*, *Wahlenbergia saxicola*, *Gleichenia dicarpa*, *Lomaria alpina*, *Lycopodium scariosum*, *Herpolirion novae-zelandiae* and the orchids *Thelymitra longifolia* and *Microtis porrifolia*; there are also occasional poor specimens of tea-tree (*Leptospermum scoparium*), which here has a hard fight to maintain its place with other competitors.

The plants in this association are at all times of interest to the nature-lover; but in summer the bright blooms of the euphrasias, celmisias, native violets, orchids, native dandelion, the sparkling berries of the dwarf coprosma, the snowy or deep-red berries of the gaultheria, and the delicately blue-tinted flowers of the wahlenbergia cannot fail to claim the attention and admiration of all who pass over them.

This grass-steppe has once carried a dense growth of the small conifers *Dacrydium Bidwillii*, *Dacrydium Colensoi*, and *Phyllocladus alpinus*, as in many places their dead stems may be found beneath the surface of the more swampy parts. It seems probable that this growth has been destroyed by a shower of hot ashes from one of the craters of the Tongariro cones. The trees on the dry places would be consumed, while those growing in the swampy places would only be killed, and, afterwards falling, would sink into the soft wet ground and be preserved.

Along the small streams traversing this grassy plain are fringes or patches of scrub which consists principally of *Olearia virgata*, *Coprosma propinqua*, *Aristotelia fruticosa*, *Carmichaelia flagelliformis*, *Veronica salicina*, *Panax Colensoi*, *Pittosporum Colensoi*, *Phyllocladus alpinus*, *Coriaria ruscifolia*, *Coriaria thymifolia*, *Myrsine divaricata*, *Gaultheria rupestris*, and occasional plants of *Fagus cliffortioides*, *Corokia cotoneaster*, and one or two *Pittosporum rigidum* plants. The *Pittosporum rigidum* here grows to the abnormal height of 15 ft., and shows extreme variation in size and shape of its leaves. Being accustomed previously only to the dwarf form (perhaps 18 in. high) that grows on the eastern side of the volcanoes, it was with astonishment that I received Mr. Cheeseman's decision that the two plants are one and the same species. In this scrub fringe are an abundance of the ferns *Aspidium aculeatum* var. *vestitum*, *Hypolepis tenuifolium*, *Lomaria alpina*, *Lomaria capensis*, *Lomaria fluviatilis*, *Gleichenia Cunninghamii*, and *Polypodium punctatum*, with *Phormium tenax* and *Arundo conspicua*.

On that part of the plain intersected by the Mangahuia and Whakapapa Streams, at an elevation of about 2,800 ft., the mountain-beech (*Fagus cliffortioides*) predominates to such an extent that the forest here might be called a mountain-beech forest, the only conifers being *Libocedrus Bidwillii* and *Phyllocladus alpinus*, with an occasional *Dacrydium Colensoi* and *Podocarpus Hallii*. The other chief plants are broadleaf (*Griselinia littoralis*), tawhero (*Weinmannia racemosa*), pokaka (*Elaeocarpus Hookerianus*), *Panax Colensoi*, and *Panax simplex*. The undergrowth is principally *Coprosma tenuifolia* and *C. foetidissima*, *Myrtus pedunculata*, *Aristotelia fruticosa*, horopito (*Drimys axillaris* and *Drimys colorata*), *Coprosma cuneata*, *Veronica salicifolia*, *Pittosporum Colensoi*, *Leucopogon fasciculatus*, and *Gaultheria antipoda*, *Gleichenia Cunninghamii*, *Lomaria discolor* and *L. capensis*, and *Cordyline indivisa* are in abundance. This association of plants extends from the junction of the Mangahuia and Whakapapa-iti to the forest-limit up the slopes of Ruapehu.

There are numerous openings in the forest in this locality which carry the same plant covering as that above described for the grass-steppe. These openings have probably been caused by fires made by Maoris as they passed at different times from Taupo and Rotoaira to old settlements at Makaretu and Moturoa.

In the neighbourhood of Erua, which is about 2,600 ft. above sea-level, and along the lower slopes of the volcanic mountain Hauhungatahi the forest is composed principally of tawhero (*Weinmannia racemosa*), white maire (*Olea lanceolata*), black maire (*Olea Cunninghamii*), rimu (*Dacrydium cupressinum*), matai (*Podocarpus spicatus*), *Podocarpus Hallii*, kaikawaka (*Libocedrus Bidwillii*), broadleaf (*Griselinia littoralis*), miro (*Podocarpus ferrugineus*), toro (*Myrsine salicina*), *Coprosma tenuifolia*, *C. foetidissima*, and *C. grandifolia*, *Fuchsia excorticata*, horopito (*Drimys colorata* and *D. axillaris*), *Dacrydium Colensoi*, *Myrtus pedunculata*, papapa (*Alseuosmia quercifolia*), putaputaweta (*Carpodetus serratus*), houhou (*Panax Colensoi*), *Panax simplex*, *Panax anomalum*, lancewood (*Pseudopanax crassifolium*), karamu (*Coprosma robusta*), *Aristotelia racemosa*, *Pittosporum Colensoi*, *Schefflera digitata*, *Coprosma cuneata*, *Coprosma parviflora*, and *Coprosma Colensoi*. In this association, which is about a quarter of a mile wide and rises about 700 ft. above the plain, fern and moss life are abundant. *Todea superba*, *Lomaria discolor*, *Lomaria Pattersoni*, *Lomaria lanceolata*, *Aspidium aculeatum* var. *vestitum* are the chief. On the trunks of the cedar (*Libocedrus Bidwillii*) the remarkable and beautiful fern *Hymenophyllum Mallingii* is abundant; and I may here remark I found it on both dead and living trees of the cedar, and on one occasion on the trunk of a *Dacrydium intermedium*.

From a height of about 3,200 ft. to about 3,800 ft. there are only occasional stunted rimu (*Dacrydium cupressinum*), *Libocedrus Bidwillii* having now become the most plentiful tree; tawhero (*Weinmannia racemosa*) is still present; Hall's totara (*Dacrydium Colensoi* and *Dacrydium intermedium*) are plentiful. The uppermost zone of forest is mostly *Phyllocladus alpinus*, *Dacrydium intermedium*, *Dacrydium Colensoi*, *Dacrydium Bidwillii*, *Panax Colensoi*, *Panax simplex*, *Coprosma foetidissima*, *Coprosma cuneata*, and *Coprosma parviflora*, and the grass *Gahnia pauciflora*.

Above the last-described association one comes to a mixed growth of subalpine shrubs, grasses, and herbs, principally *Senecio Bidwillii*, *Olearia nummularifolia*, *Cassinia Vauvilliersii*, *Veronica laevis*, *Veronica buxifolia*, *Veronica tetragona*, *Pimelea buxifolia*, *Panax Colensoi*, *Dracophyllum recurvum*.