Art. IV.—*Notes on the Plant Covering of Codfish Island and the Rugged Islands.*

By D. L. Poppelwell.

[*Read before the Otago Institute, 3rd October, 1911.*]

Plate IX.

A. General.

Codfish Island and the Rugged Islands lie off the north-west coast of Stewart Island, and form practically the first barrier met by the south-western storms on their long journey from the Antarctic ice. Unstayed by any break for thousands of miles, these fierce winds sweep across the waters, raising them in angry waves, which, gathering strength and bulk as they travel, ultimately strike these islands with almost irresistible force. The torn and ragged nature of the western coasts speak eloquently of their struggle with these keen winds and storms. The vegetation, too, has through the ages found its place in the struggle for existence both as regards its form and distribution. Dr. Cockayne, in his splendid and exhaustive report on the botany of Stewart Island, has confined himself practically to the mainland, hence a few notes on the flora of these hitherto-unbotanized western ramparts may be interesting.

During Easter, along with a small party of Gore residents, including Messrs. G. J. Anderson, M.P., and R. Fisher, to the latter of whom I am indebted for the photographs here published, I had the good fortune, by the courtesy of the Messrs. Hansen Brothers, to spend the best part of two days at Codfish Island. We left Half-moon Bay by steamer early on Monday, the 17th April, arriving at Sealers' Bay, Codfish Island, at 10.30 a.m., and left again at 3.30 p.m. on the following day. I spent several hours of each day examining the flora, and this paper is based upon observation and notes taken on the spot.

Sealers' Bay about eighty years ago was the site of a sealing settlement; hence, no doubt, the name. The island has long since been deserted, but signs of the old settlement are evident in the clearings in the forest where the huts once stood.

The indigenous species noted numbered 111, belonging to seventy-six genera and thirty-seven orders.

In addition to the indigenous plants, some five naturalized plants were observed, all of which were confined to the open land, and all but one were on the sand-dunes. Perhaps the most abundant of these plants were *Mentha spicata* and *Foeniculum officinale*. Both of these species are used for flavouring sauces, and no doubt were a survival of the old settlement on Codfish Island. Two other plants were *Cryptostemma calendulaceum* and *Cnicus lanceolatus*, the seeds of which were no doubt carried by the wind. The fifth plant was the almost universal *Poa pratensis*, probably introduced by cattle, of which there are a few on the island.

None of these colonists played any dominant part in the plant-association, although *Mentha spicata* held its own with the ferns—*Pteridium aquilinum* and *Lomaria capensis*—in the forest clearings, and *Foeniculum officinale* occupied the position of isolated plants fairly plentifully dotted over the sandhills.

B. PHYSIOGRAPHY.

The physical features of Codfish Island are much less rugged than those of the shore of the mainland, distant about a mile, where the jagged peaks of the Ruggedy Mountains, rising boldly from the sea, are wild in the extreme. The Rugged Islands form the northern extremity of the range, and partake of the same nature as the main chain. Codfish Island is much more level, and, although about two miles and a half square, no part of it reaches a greater height than about 500 ft. It is forest-clad, except in one or two places where there are small beaches flanked with rocky buttresses and backed by sandhills.

C. PLANT-ASSOCIATIONS.

The vegetation may be fitly dealt with under the several headings of (1) Dunes, (2) Cliffs, (3) Forest.

(1.) *Dunes.*

The shore at Sealers' Bay consists of a sandy beach about half a mile long, terminating in rocky abutments, and having a row of dunes at the back. These dunes are only about 5 chains deep, and rise at their eastern extremity to a height of about 100 ft. They are fairly sheltered by the background of hills, but are exposed to the north and north-west winds. Most of the dunes are fixed, but in parts the sand is still unstable, and towards the east the dunes show evidence, in their greater height and loose appearance, of the effect of the northerly gales. The fore dune, as is usual, is covered with the common sand-binding *Scirpus frondosus*. Behind this, however, a much more complex vegetation is found. The principal plants of the association are *Poa caespitosa*, with an abundance of *Linum monogynum*, *Coprosma acerosa*, and *Pimelea Lyallii;* while dotted throughout these are *Coprosma Colensoi*, *Halorrhagis erecta*, *Euphorbia glauca*, *Scirpus nodosus*, *Senecio lautus*, and *Anisotome intermedia*, with stunted forms of *Myrsine Urvillei*. *Coprosma acerosa* forms in many places an almost continuous mat running flat over the sand, and *Pimelea Lyallii* also takes on a similar habit, except it is climbing through some other plant, when in places it reaches a height of about 4 ft. In damper situations patches of *Hierochloe redolens* and *Hydrocotyle novae-zealandiae* make their appearance, while here and there *Acaena Sanguisorbae*, *Geranium sessiliflorum*, or *Muehlenbeckia complexa* creep over the surface. *Taraxacum officinale* var. *glabratum* and *Erechtites prenanthoides* are also found, with occasional plants of *Veronica elliptica*, *Calystegia Soldanella*, *Lomaria alpina*, *Epilobium nerterioides*, *E. junceum*, *Gnaphalium luteo-album*, and *G. japonicum*. In parts there are many plants of *Craspedia uniflora* var. *robusta*, with the naturalized *Foeniculum officinale*. Where the dunes are absolutely stable the plant covering changes somewhat, and the following typical association is found: *Pteridium aquilinum* in patches, *Poa caespitosa*, *Scirpus nodosus*, *Phormium Cookianum*, *Acaena Sanguisorbae*, *Halorrhagis erecta*, *Veronica elliptica*, with dwarf specimens of *Aristotelia racemosa*, *Dicksonia squarrosa*, *Aspidium vestitum*, *Senecio rotundifolius*, *Astelia nervosa*, *Lomaria capensis* *Asplenium lucidum*, *Craspedia uniflora*, and *Myrsine Urvillei*. Further back, next the edge of the bush, *Leptospermum scoparium* is found, with here and there small patches of *Lagenophora pumila*, *Gunnera arenaria*. *Sonchus littoralis*, and *Apium prostratum*, and nearer the shore *Rumex neglectus*. *Festuca littoralis* is also fairly

plentiful. At their highest point, where the dune-plants merge into the forest, a heath is found, in which the principal plants are *Lomaria capensis*, *Leptospermum scoparium*, *Muehlenbeckia complexa*, *Lycopodium volubile*, *Gaultheria antipodum* var. *erecta*, *Aristotelia racemosa*, *Carpodetus serratus*, stunted *Weinmannia racemosa*, *Dracophyllum longifolium*, and *Pteridium aquilinum*.

(2.) *Cliffs.*

The association in these situations differs a good deal according to the varying situation, the principal factor in the change being, apparently, wind. Thus, on the exposed points, where the wind has most effect, the principal plant is *Olearia angustifolia*, which is so plentiful in places as to form an almost pure association. Hitherto *Olearia angustifolia* has been reported only from south of Paterson Inlet, on the east coast of Stewart Island, and from the north and south ends of Mason's Bay, on the western coast. The only other localities where it has been observed, apart from the Stewart Island habitats mentioned, are the base of Bluff Hill and Puysegur Point. Not only is it the chief plant of the coastal cliffs of Codfish Island, but it is equally abundant on the seaward base of the Ruggedy Mountains. It forms almost the sole plant covering of the Rugged Islands, where the whole cliff-sides for hundreds of feet are one close mat of stunted weather-beaten plants whose handsome grey-green rosette-like foliage and rounded form stamp the physiognomy of the coast-line in a most marked manner. Dr. Cockayne, in his Stewart Island report, draws attention to the difference in the size of the leaves on different plants of this species, noting two forms of leaf, one about $\frac{3}{4}$ in. to 1 in. in diameter and the other only about $\frac{1}{2}$ in. wide. This same peculiarity was noted by me on bushes growing side by side, and seemed to me to be constant throughout all the leaves of the particular plants, so as almost to suggest varietal distinction. Although *Olearia angustifolia* is the chief plant on cliffs, its predominance is confined to the water's edge, and even there in places it is much mixed with *Senecio rotundifolius*. Speaking generally, *Senecio rotundifolius* increases as a greater height is reached, when *Olearia Colensoi* creeps into the association. The three plants named form the basis of the "*Senecio-Olearia*" association so exhaustively dealt with in Dr. Cockayne's report above mentioned. Growing throughout this association will be found numerous specimens of *Veronica elliptica*, with here and there plants of *Phormium Cookianum*, *Anisotome intermedia*, *Dracophyllum longifolium*, and the shore-ferns *Lomaria dura* and *Asplenium lucidum*. Occasional specimens of *Nothopanax Colensoi* push their green heads through the close-growing scrub. On the rocks at the foot of the cliffs the plants noted were *Crassula moschata*, *Selliera radicans*, *Apium prostratum*, *Myosotis albiflora*, *Scirpus nodosus*, and *Gentiana saxosa*. Where the peat was drier *Gnaphalium trinerve* and *Aspidium vestitum* were also observed.

At the western side of the bay, where the cliffs are more sheltered, a much richer flora was seen. Here, as before, *Olearia angustifolia* and *Senecio rotundifolius* predominated, but *Olearia Colensoi* also appeared in increased numbers, until, as the top of the steep faces was reached, it took the place of the first-named species in the lower formation. Of smaller plants, the principal were *Tetragonia trigyna*, *Anisotome intermedia* (plentiful), *Gentiana saxosa*, *Crassula moschata*, *Poa Astoni* and *P. Colensoi* (on the bare points), *Asplenium lucidum*, *A. obtusatum*, *Mesembryanthemum australe*, *Poa foliosa*, *Lomaria dura*, *Phormium Cookianum*,

Astelia nervosa, and *Stilbocarpa Lyallii*. The last-mentioned was growing in large colonies in several places visible from the sea. Its magnificent leaves, from actual measurement, attained 17 in. in width, and the plants were over 3 ft. tall. Gradually as the rock-face was receded from and the soil became more peaty the scrub became more mixed, until it ultimately merged into forest. An almost similar formation to that described above apparently covers the seaward base of the Ruggedy Mountains, and extends round the north-west coast of the mainland of Stewart Island, although the northern coast seems to want the *Olearia angustifolia* altogether. Of this latter fact I am not certain, as I did not land, and was scarcely close enough inshore to be sure.

The Rugged Islands vegetation may all be described under this heading, as the islands are nothing more than great rocks. The cliff-faces for hundreds of feet are absolutely bare where the full blast of the south-western winds strikes them, but on the northern and eastern sides, where there is a little shelter, the cliffs are covered, as before mentioned, with a close mat of *Olearia angustifolia*. In places *Veronica elliptica* clings to the rocks, with some plants of *Phormium Cookianum* and a few tussock-grasses. An occasional stunted plant of *Metrosideros lucida* appears to maintain a precarious existence on the higher points, with a specimen or two of *Olearia Colensoi*, and probably some *Senecio rotundifolius*. *Anistome intermedia* and some of the smaller plants also appear in the crevices. The dominant feature, however, of these wild and inhospitable rock-faces is *Olearia angustifolia*, which is flattened against the cliffs in small and stunted growth in the stormy area, and in proportion as shelter is found in the nooks it becomes larger, and covers the nakedness of the rocks with a grey-green mantle.

(3.) *The Forest.*

General.

The general aspect of the forest of Codfish Island presents a succession of low ridges of sage-green colour, here and there relieved by darker patches. The exposed points, on the contrary, are of much lighter colour, and when the wind blows are traversed by waves of white by the underside of the leaves being thrown up to sight. The top of the forest proper presents an uneven surface, while that of the exposed points is rounded and smooth on the surface. The dominant colour and uneven surface of the forest are brought about by the superabundance of *Dacrydium cupressinum*, whose tall yellowish-green heads are lifted high above the general level of the forest. The darker patches represent patches of *Metrosideros lucida*, although the lighter-green foliage of *Weinmannia racemosa* is also noticeable. The general forest may be placed under the category of the "*Rimu-Kamahi*," and the more exposed scrub as belonging to the "*Senecio-Olearia*" association of Cockayne's report. Of these divisions, the latter may fairly be called "coastal scrub" and the former the "forest."

* *Coastal Scrub.*

The coastal scrub, as before mentioned, is comprised principally of *Olearia angustifolia*, *Senecio rotundifolius*, and *Olearia Colensoi*, but *Dracophyllum longifolium* also plays a part in it. Close in their foliage, with bent, weird stems and branches, these plants have almost an eerie look, suggestive of some contest with *taniwhas* or other powers of darkness. When, however, after a struggle up the cliff-side, one fairly penetrates

the scrub, the growth of lovely plant forms which greets the vision is delightful. Here the coast-ferns *Asplenium lucidum* and *Lomaria dura* grow to perfection, while straggling plants of *Phormium Cookianum* are found seemingly somewhat out of their station, which is usually on the coastal cliffs in this region. Great colonies of *Stilbocarpa Lyallii* make their appearance, in places over 3 ft. tall, and with their large reniform leaves suggesting more a tropical growth than a subantarctic one. These latter plants are extremely abundant, the patches in places extending over areas almost a quarter of an acre in extent. As we ascend the hill the association changes. *Asplenium obtusatum* of large dimensions puts in an appearance, along with *Lomaria discolor, Hypolepis tenuifolia, Astelia nervosa, Polypodium Billardieri, Nothopanax Colensoi, Myrsine Urvillei, Coprosma lucida,* and *Dicksonia squarrosa.* Here there is evidence of bird-life. The burrows of the mutton-bird (*Puffinus griseus*) ramify in all directions through the peaty soil, and no doubt affect the plant-association by draining and aerating the soil, while the traffic of the birds themselves must destroy much of the usual undergrowth of the forest. What appeared to be a direct effect of the nests of this petrel was noticeable in one place where a mass of the fern *Lomaria dura* was growing on a heap of humus which was literally honeycombed with burrows. The plants were much larger than usual, and each had a distinct caudex about 12 in. high. At a height of about 250 ft. the forest became more mixed and the undergrowth thicker. *Nertera dichondraefolia* grew on the logs, *Coprosma foetidissima* became common, and *Aspidium vestitum* was added to the former association. At 300 ft. the first *Metrosideros lucida* was encountered and *Dracophyllum* became fairly plentiful. *Nothopanax Edgerleyi* also appeared, and *Myrsine Urvillei, Dicksonia squarrosa,* and *Nothopanax Colensoi* became plentiful. The forest-floor now became covered with *Lomaria capensis* and *Lomaria discolor,* the former especially attaining large dimensions, while the specimens of *Asplenium obtusatum* became larger also. As the top of the ridge was reached *Pittosporum Colensoi* var. *fasciculatum* appeared, with a few plants of *Pteridium aquilinum* and *Rubus australis.* From the top a fine view was obtained to the south-west. Looking over the forest-top, one could see the wind-swept appearance to the south-west, the principal plants being stunted *Metrosideros lucida, Olearia Colensoi, Senecio rotundifolius, Dracophyllum longifolium,* with occasional specimens of *Myrsine Urvillei.* Proceeding along the ridge. *Weinmannia racemosa* became more plentiful, and *Astelia* increased on the forest-floor, along with *Lomaria capensis, Aspidium vestitum, Asplenium bulbiferum,* and *A. obtusatum,* the general depth of the floor-covering being about 4 ft. In hollows where the ground was damper a strong growth of fern-trees (*Dicksonia squarrosa*), with *Nothopanax simplex, Shefflera digitata,* and a broad-leaved species of *Carex ternaria,* was seen, while the logs became covered with *Luzuriaga marginata* and filmy ferns. Here also a few examples of *Podocarpus ferrugineus* were seen, and the tangled stems of the *Rhipogonum scandens* blocked the way, and marked the edge of the forest proper.

** *The "Rimu-Kamahi" Forest.*

Lying to the back of the sandhills, an extensive area of forest of this class is visible. Its outer fringe touches the sand-dunes, and it extends to the highest parts of the island, although the trees become stunted on the heights, and rocks show through the low scrub on the very summit The lowland bush consists principally of *Griselinia littoralis, Muehlenbeckia*

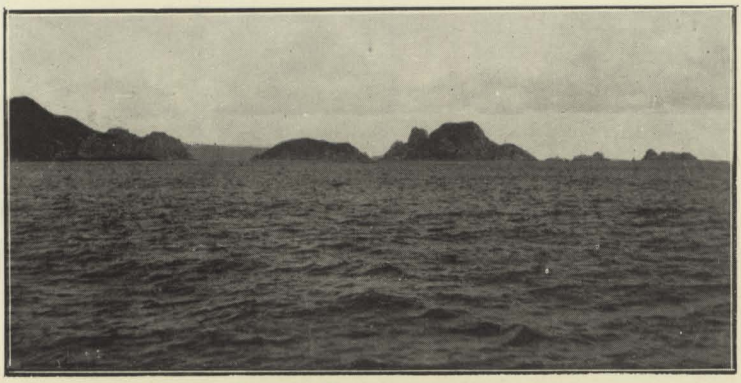

FIG. 1.—RUGGED ISLANDS, FROM THE NORTH.
Codfish Island in distance.

FIG. 2.—VIEW OF NORTHERN ASPECT OF ONE OF RUGGED ISLANDS.
Olearia angustifolia in bloom. *Olearia Colensoi* on summit.

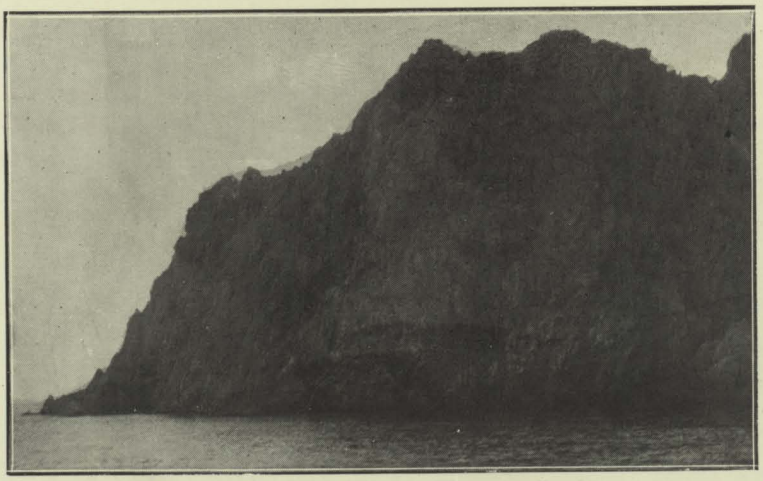

FIG. 3.—RUGGED ISLANDS (WEATHER SIDE).
The exposed parts are practically devoid of plant covering, but crevices full of stunted *Olearia angustifolia*.

Face p. 80.]

complexa, Dicksonia squarrosa, Hemitelia Smithii, Fuschia excorticata, Carpodetus serratus, Weinmannia racemosa, Pittosporum Colensoi, Myrsine Urvillei, Coprosma lucida, Aristotelia racemosa, Schefflera digitata, Pseudopanax crassifolia, and *Rhipogonum scandens.* Some plants of the latter were resplendent with their scarlet drupes. The principal undergrowth consisted of *Lomaria dura, L. lanceolata, Asplenium bulbiferum, Nertera dichondraefolia, Asplenium flaccidum, Polypodium Billardieri, P. australe, Lomaria capensis, Hymenophyllum demissum, H. dilatatum, H. sanguinolentum,* and a species of *Uncinia.* In the damper parts I also noted *Nothopanax Colensoi, Coprosma areolata, Nothopanax Edgerleyi, Alsophila Colensoi, Rubus schmidelioides, Leptospermum scoparium, Myrtus pedunculata, Luzuriaga marginata, Suttonia divaricata, Coprosma Colensoi, C. propinqua, C. rhamnoides,* and *Metrosideros hypericifolia.* After crossing a swampy creek the ground became drier, and *Podocarpus Hallii, P. ferrugineus,* and *Dacrydium cupressinum* joined the association, while the floor became covered with *Lomaria discolor* of immense size. An occasional plant of *Gaultheria antipoda* var. *erecta* was also seen. *Dacrydium cupressinum* here tops the forest, some of the trees being of large size, with fine clean boles, and in many cases no branches for a height of 40 ft. to 50 ft. There was little growth of intermediate height, the principal being *Metrosideros lucida, Nothopanax Colensoi,* and, strange to say, dwarfed specimens of *Sencio rotundifolius;* but the forest-floor was covered by a strong growth of ferns, principally *Lomaria capensis, L. discolor,* and *Polypodium Billardieri. Astelia nervosa* was also plentiful, with quantities of the beautiful filmy ferns. At a height of about 350 ft. a plant of *Styphelia acerosa* was encountered, and from this upwards this plant became fairly plentiful. We ultimately attained a height of about 450 ft. with little change in the association, but *Weinmannia racemosa* became less and *Metrosideros lucida* more plentiful, while the floor-covering alternated between *Lomaria capensis* and *Polypodium Billardieri,* each almost pure. On our return we traversed an exposed open rocky spur, where a small heath made its appearance, the principal plants being *Lomaria capensis, Leptospermum scoparium, Muehlenbeckia complexa, Lycopodium volubile, Gaultheria antipodum,* stunted *Aristotelia racemosa* and *Weinmannia racemosa, Dracophyllum longifolium, Pteris incisa,* and *Pteridium aquilinum.*

D. CONCLUSION.

There are, on the whole, apparently no very marked differences in the flora of these islands and the adjoining mainland, except, of course, the number of species is limited on the islands. The greatest surprise is perhaps the abundance of *Olearia angustifolia* and the immense size of the ferny undergrowth in the forest proper. The dune association is fairly well that of Mason's Bay, and the mat-like habit of *Pimelea Lyallii, Geranium sessiliflorum,* and *Coprosma acerosa* is precisely that mentioned by Cockayne in his reference to the dune-covering of Port William. The wind factor is the principal one in determining the distribution of the plants, and the "wind-tolerating" theory of Cockayne receives corroboration by the way that *Olearia Colensoi* gives way to *Senecio rotundifolius* and the latter to *Olearia angustifolia,* according to the degree of exposure. Where the wind is sufficiently direct *Olearia angustifolia* itself disappears, leaving practically bare rocks, as on the exposed sides of the Rugged Isles.

LIST OF SPECIES NOTED.

(1.) PTERIDOPHYTA.

Hymenophyllaceae.

Hymenophyllum demissum (Forst. f.) Sw. On logs in damp forest plentiful.
dilatatum (Forst. f.) Sw. On logs in damp forest; plentiful.
sanguinolentum (Forst. f.) Sw. On logs in damp forest; plentiful.
tunbridgense (L.) Sm. On logs in damp forest; plentiful

Cyatheaceae.

Dicksonia squarrosa (Forst. f.) Sw. Abundant in forest.
Hemitelia Smithii (Hook. f.) Hook. Forest; not plentiful.
Alsophila Colensoi Hook. f. Forest; rare.

Polypodiaceae.

Polypodium Billardieri R. Br. Plentiful in forest.
australe Mett. Logs in damp forest.
Pteridium aquilinum Kuhn. Heath and stable dunes.
Pteris incisa Thunb. Damp forest.
Aspidium vestitum Swartz. Fairly abundant in forest.
Asplenium bulbiferum Forst. f. Abundant in forest.
flaccidum Forst. f. Abundant in forest.
lucidum Forst. f. Coastal scrub; plentiful.
Lomaria alpina Spreng. Dunes; rare.
dura Moore. Coastal scrub; abundant.
lanceolata Spreng. Forest; abundant.
capensis Willd. Forest; abundant.
discolor Willd. Forest; abundant.
Hypolepis tenuifolia (Forst. f.) Bernh. Forest; abundant.

Lycopodiaceae.

Lycopodium volubile Forst. f. Stony heath; plentiful.

(2.) SPERMOPHYTA.

Taxaceae.

Podocarpus Hallii T. Kirk. In forest; common.
ferrugineus Don. In forest; fairly common.
Dacrydium cupressinum Sol. In forest; abundant.

Gramineae.

Hierochloe redolens (Forst. f.) R. Br. Damp dunes.
Poa foliosa Hook. f. Coastal cliffs.
Astoni Petrie. Coastal cliffs.
caespitosa Forst. f. Dunes; abundant.
Colensoi (?) Hook. f. Coastal cliffs; rare.
Festuca littoralis Labill. Dunes; fairly plentiful.

Cyperaceae.

Scirpus nodosus (R. Br.) Rottb. Dunes; plentiful.
frondosus Banks & Sol. Dunes; plentiful.
Uncinia pedicellata Kükenth. Damp forest.
Carex ternaria Forst. f. Wet ground; common.
trifida Cav. Damp ground; open forest.

Liliaceae.

Rhipogonum scandens Forst. Plentiful in forest.
Luzuriaga marginata (Banks & Sol.) Benth. & Hook. f. Logs in forest.
Astelia nervosa Banks & Sol. Dunes, sheltered rocks, forest.
Phormium Cookianum Le Jolis. Coastal rocks and scrub.

Polygonaceae.

Rumex neglectus Kirk. Stony beach.
Muehlenbeckia complexa (A. Cunn.) Meissn. Dunes, damp forest, heath.

Aizoaceae.

Mesembryanthemum australe Sol. Coastal rocks; rare.
Tetragonia trigyna Banks & Sol. Coastal cliffs; rare.

Crassulaceae.

Crassula moschata Forst. f. Coastal rocks.

Saxifragaceae.

Carpodetus serratus Forst. Forest; plentiful.

Pittosporaceae.

Pittosporum tenuifolium Banks & Sol. In forest; rare.
Colensoi var. *fasciculatum* (?) Hook. f. In forest; rare.

Cunoniaceae.

Weinmannia racemosa L. f. Abundant in forest.

Rosaceae.

Rubus australis Forst. f. In damp forest.
schmidelioides A. Cunn. In damp forest.
Acaena Sanguisorbae Vahl. Plentiful on stable dunes.

Geraniaceae.

Geranium sessiliflorum Cav. Dunes; abundant.

Linaceae.

Linum monogynum Forst. f. Dunes; abundant.

Euphorbiaceae.

Euphorbia glauca Forst. f. Dunes; abundant.

Elaeocarpaceae.

Aristotelia racemosa (A. Cunn.) Hook. f. Plentiful: stable dunes and forest-edge.

Thymelaeaceae.

Pimelea Lyallii Hook. f. Dunes; abundant.

Myrtaceae.

Leptospermum scoparium Forst. Edge of forest; plentiful.
Metrosideros lucida (Forst. f.) A. Rich. Abundant in forest.
hypericifolia A. Cunn. Rare in forest.
Myrtus pedunculata Hook. f. Damp forest; rare.

Onagraceae.

Epilobium nerterioides A. Cunn. Dunes; fairly plentiful.
junceum Sol. Dunes; rare.
linnaeoides Hook. f. Dunes; rare.
Fuchsia excorticata L. f. Edge of forest; rare.

Halorrhagaceae.

Halorrhagis erecta (Murr.) Schindler. Dunes; plentiful.
Gunnera arenaria Cheeseman. Dunes.

Araliaceae.

Stilbocarpa Lyallii J. B. Armstrong. Coastal scrub: abundant.
Nothopanax simplex Forst. f. In forest; rare.
Edgerleyi (Hook. f.) Seem. In forest; plentiful.
Colensoi (Hook. f.) Seem. In forest; plentiful.
Schefflera digitata Forst. Damp forest.
Pseudopanax crassifolium (Sol.) C. Koch. Plentiful in forest.

Umbelliferae.

Hydrocotyle novae-zealandiae D.C. Damp dunes.
Apium prostratum Lab. Coastal rocks and dunes.
Anisotome intermedia Hook. f. Coastal rocks; plentiful.

Cornaceae.

Griselinia littoralis Raoul. Forest; not plentiful.

Ericaceae.

Gaultheria antipoda Forst. f. var. *erecta* Cheesm. Forest; comparatively rare.

Epacridaceae.

Styphelia acerosa Sol. In forest; fairly plentiful.
Dracophyllum longifolium (Forst. f.) R. Br. Coastal scrub; abundant.

Myrsinaceae.

Myrsine Urvillei (A.D.C.) Mez. Dunes and forest, coastal scrub.
Suttonia divaricata (A. Cunn.) Hook. f. Damp forest.

Primulaceae.

Samolus repens Forst. var. *procumbens*, R. Knuth. Damp rocky situations near shore.

Gentianaceae.

Gentiana saxosa Forst. f. Coastal rocks; plentiful.

Convolvulaceae.

Calystegia Soldanella (L.) R. Br. Dunes; rare.

Boraginaceae.

Myosotis albiflora (T. Kirk) Cheesem. Rocks near sea.

Scrophulariaceae.

Veronica salicifolia Forst. f. In damp forest.
elliptica Forst. f. Plentiful on coastal rocks.

Rubiaceae.

Coprosma lucida Forst. f. In forest; rare.
areolata Cheesem. Damp forest.
foetidissima Forst. Abundant in forest.
rhamnoides A. Cunn. Plentiful in damp places.
acerosa A. Cunn. Abundant on dunes.
propinqua A. Cunn. Damp forest.
Colensoi Hook. f. Plentiful in damp forest.
Nertera depressa Banks & Sol. On logs in forest.
dichondraefolia (A. Cunn.) Hook. f. On logs in forest.

Goodeniaceae.

Selliera radicans Cav. Damp places on coastal rocks.

Compositae.

Lagenophora pumila (Forst. f.) Cheesem. Stable dunes.
Brachycome Thomsonii T. Kirk. Stable dunes.
Olearia angustifolia Hook. f. Coastal cliffs; abundant.
Colensoi Hook. f. Coastal scrub; abundant.
Gnaphalium trinerve Forst. f. Dunes; plentiful.
luteo-album L. Dunes; plentiful.
japonicum Thunb. Dunes; plentiful.
Craspedia uniflora Forst. f. var. *robusta* Hook. f. Dunes; abundant
Erechtites prenanthoides (A. Rich.) D.C. Dunes; fairly plentiful.
Senecio lautus Forst. f. Dunes; rare.
rotundifolius Hook. f. Coastal scrub; abundant. In forest; rare.
Taraxacum glabratum (Forst. f.) Cockayne. Dunes; fairly plentiful.
Sonchus littoralis (Kirk) Cockayne. Dunes.

LIST OF NATURALIZED PLANTS.

Mentha spicata L. Old clearings.
Foeniculum officinale Hook. f. Sand-dunes.
Cryptostemma calendulaceum R. Br. Sand-dunes.
Cnicus anceolatus Willd. Sand-dunes.
Poa pratensis L. Sand-dunes.