ART. III.—Some Notes on the Botany of the Spenser Mountains, with a List of the Species collected.

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[Read before the Philosophical Institute of Canterbury, 1st November, 1911.]

ROUTE.

In December—January, 1910–11, we arranged a small party* to take pack-horses and ascend the headwaters of the Waiau and the Clarence Rivers. We left Hanmer, and went by way of Jack's Pass and Fowler's Pass to the out-station on the Ada. We camped near the foot of the saddle, and explored the surrounding country botanically. Our next camp was in Glacier Gully, a small tributary of the Waiau, some five miles farther to the east. Thence we crossed Maling's Pass to Lake Tennyson, in the neighbourhood of which several days were spent. Bad weather, unfortunately, prevented the ascent of any of the higher peaks. The highest point attained was probably under 6,000 ft., on Mount Princess. Some of the upper alpine plants may, therefore, have escaped observation. The return to Hanmer was made via the Clarence Valley.

HISTORICAL.

The Spenser Mountains form a little-known district of the Southern Alps, lying at the headwaters of the Waiau, Clarence, and the Wairau. The district was first explored by Mr. W. T. L. Travers during the end of February and the beginning of March, 1860. An account of this exploration will be found in the Nelson Examiner of the 14th March, 1860. During the trip he named "the Spenser Mountains in honour of the poet of that name." The name is now often misspelt "Spencer." Maling's Pass is so designated in honour of Mr. C. Maling, who accompanied Travers, and who had seen the pass on a previous trip with Mr. Domett. Maling's Pass leads from the watershed of the Clarence into that of the Waiau. Tributaries of the Waiau were named by Mr. Travers after his children—the Ada, the Henry, and the Anne. Celmisia Traversii was originally discovered on the summit of the mountain between the Ada and the Anne. Other novelties discovered by Travers in the district were Ranunculus crithmiolius, R. Lyallii var. Traversii, R. Sinclairii, Pittosporum patulum, Gnaphalium nitidulum, and Wahlenbergia cartilaginea. Of these, Gnaphalium nitidulum has not again been found, unless, as appears likely (see subjoined list), it is amongst the specimens collected by us.

Since the time of Travers the district has apparently several times been visited by collectors and botanists. However, there is no published account of its botany, and the only list of species drawn up for it is a short one appearing at the end of an article on the ascent of Mount Franklin by Park (Trans. N.Z. Inst., vol. 18, p. 350). This contains seventy-eight species, identified by Buchanan. Of these, about a fifth were not collected by us,
but it has not been thought advisable to include them in our list. Indeed, it appears to us that several of those there recorded are most unlikely inhabitants of the district—e.g., Dodonaea viscosa, Gentiana concinna, G. saxosa, Dracophyllum Urvillaeum (typical form), Veronica odorata, Ranunculus pinguis. Various species, also, which we had expected to get were not found by us. Amongst these may be noted Celmiaia Traversisii, of which, however, we saw specimens from Mount Percival, at the back of Hanmer, and Ranunculus Lyallii, which we did not see at all, though we were assured that it grows in the district. It is quite clear that neither of these species are common in the Spenser Mountains.

There are several reports on the geology of the district. References to it will be found in Haast's "Report of a Topographical and Geographical Exploration of the Western Districts of the Nelson Province," 1861. He visited the Buller and Grey Valley in 1860, and saw the Spenser Mountains from their western sides. He speaks of "the high mountain-chain, called by my friend Mr. Travers the Spencer [sic] Mountains, whose highest peak, clad with eternal snow, rose grandly above the low hills in front of it. I named this mountain, Mount Franklin, in honour of the late Sir John Franklin."

In the "Reports of Geological Explorations during 1888-89" (Wellington, 1890) there is an article by Mr. A. McKay on the "Geology of Marlborough and the Amuri District of Nelson," which describes the geology of the eastern slopes of the Spenser Mountains (throughout the report spelt "Spencer").

**Topographical.**

The Spenser Mountains are some twenty-five miles in length, and are generally regarded as lying between the saddle of the Ada (3,300 ft.) and Mount Franklin (7,671 ft.). The peaks are of a nearly uniform height of 7,000 ft., with an upward tendency towards Mount Franklin. The height of 10,000 ft. allotted to Mount Franklin by some of the earlier explorers was an error, doubtless due to its extensive snowfields and alpine magnificence. The Waiau, Clarence, and Wairau all converge upon this peak, and, indeed, their chief sources lie upon it. To the south are Mounts Guinevere, Aeneid (7,060 ft.), Princess (6,973 ft.), Una (7,540 ft.), and Faerie Queene (7,332 ft.). The Tennysonian names are due to Governor Weld.* In the valley of the Waiau lies Lake Guyon, and in that of the Clarence Lake Tennyson. Both are glacier lakes, due to the banking-up of the waters by morainic deposits. Indeed, the whole country gives evidence of having at one time been heavily glaciated. The Ada Stream runs through a wide glacial valley, and there has been a large terminal moraine across the Waiau about a mile and a half below its junction with the Ada. The head of the low saddle lies also in a flat open valley, about 200 yards wide, having at its highest portion a Sphagnum bog. This valley shows no terracing. Opposite its mouth there are a number of parallel lines extending up to about 800 ft. on the left bank of the Waiau. These are perhaps lines of glacial pressure. Glacier Gully has doubtless at one time carried a secondary glacier, but now it can scarcely be regarded as true to name. It opens out at its head into a large cirque on the flanks of

* "Account by F. A. Weld of an Expedition with a View of Discovering a Direct Route between Nelson and Canterbury" ("Canterbury Provincial Gazette," vol. 2, No. 13, p. 51). Weld's trip was made in 1853.
Mount Una, and the bed of the stream (about 3,300 ft. altitude) contains fragments of melting névé about 10 ft. thick. Judging by appearances, this névé would scarcely last through the summer. The lowest portion was detached from the rest, and was about 100 yards long and 25 yards wide. It was bisected by the stream. A little clear ice was visible at the foot of the névé. A pronounced hanging valley on the right of the stream and the remnants of a lateral moraine showed that at one time a glacier of respectable dimensions had filled the creek-bed. The valley is an open one, about 100 yards wide.

The country becomes progressively drier as we go eastward from the Waiau to the Wairau Valley. There are few shingle-slips to be seen on Mount Faerie Queen, as looked at from the Ada Valley. Those on Mount Una, as viewed from Glacier Valley, are a little more extensive, but in the neighbourhood of Lake Tennyson they become more numerous and occupy a larger area. The Wairau Valley, from a saddle above Lake Tennyson, appeared as dry as the region in the neighbourhood of Mount Arrowsmith. Doubtless the westerly rains pass over the saddle into the fertile Ada Valley and Stanley Vale, but are unable to penetrate to the country at the headwaters of the Wairau.

The greater denudation in the Waiau Valley prevents the accumulation of shingle-slips there.

Vegetation.

In the absence of meteorological statistics, it is, of course, impossible to show directly how climatic conditions are affecting the vegetation, and indirect evidence only is available. The conditions in the district, however, resemble those that prevail in the Mount Arrowsmith region, as the plant formations are very similar, and a large number of species are common to both districts. Indeed, the general description given of the plant formations in the Arrowsmith district* would apply to this with but few modifications. Rock, river-fan, river-bed, tussock steppe, bog, lake, forest, fell-field, and shingle-slip present similar features and similar plant-associations in both districts. Certain subassociations of the Arrowsmith district were, however, not noticed in the Spenser Mountains. Dwarf Carmichaelias were observed only in the Waiau River bed near Hamner, and there only a few plants of an unidentified species. The accompanying species of the Mount Arrowsmith district—e.g. Veronica pimeleoides var. minor and Muehlenbeckia ephedroides—were not observed in the more northern area, nor did we see in the Spenser Mountains any such forest as the subalpine totara forest of the Upper Rakaia Valley. Indeed, forest-trees of any kind, with the exception of species of Nothofagus, Nothopanax, Gaya, and Pittosporum, were completely absent from the Spenser Mountains. The complete absence of any of the species forming the usual coastal forests of New Zealand is perhaps the most remarkable feature of the district. The subalpine scrub is also poorly represented both in quantity and number of species. River steppe, fell-field, shingle-slip, and rock occupy nine-tenths of the district. The Nothofagus forest was found only in the river-valleys, and decreased in quantity from west to east. Only a few acres are to be seen in the Upper Clarence Valley, close to the sides of Lake Tennyson. The upper portion of the Ada Valley, however, contains considerable quantities of the forest, and has contained more; but some has been destroyed by fire.

and some cut out for timber. A fuller description of this forest and of the Sphagnum bog on the Ada Saddle are given, as they differ considerably in composition from the similar associations observed in the Arrow-smith district.

**Physiognomic Changes.**

The district has been in occupation by runholders almost since its discovery, and as a result many changes have been effected in the general composition of its vegetation. On the river-flats of the Ada and Clarence Valleys English pasture grasses have been sown, and flourish luxuriantly, displacing to a large extent the native plant covering. The lower portion of the Ada Valley contains beautiful pasturage of cocksfoot and white clover, with here and there a considerable admixture of Yorkshire fog. Occasional patches of Acena microphylla, A. Sanguisorbae, Asperula perpusilla, Oremyrhhis andicola, Cotula dioica, C. squallida, and specimens of Stackhouseia minima, Ranunculus foliosus, &c., occur in the midst of the pasture. In the stonier portions it is crossed by lines and thickets of Discaria scrub, which rises to a height of 15 ft. to 20 ft., intermingled with occasional specimens of Coprosma propinqua and Veronica cucumisoides. This pasture in the Ada Valley passes at its upper margin into Nothofagus forest. The original tussock steppe and the forest-area has been much altered by burning. Severe burns have evidently taken place from time to time, and much of the southern beech* is second growth, with the stumps of the older and heavier trees still standing above it. Sorrel is rapidly gaining ground in many places, and is even invading the shingle-slips. Above the bush is Danthonia steppe, which has also in some places been subjected to severe burning. The fell-fields, too, have suffered occasionally from this cause, and new shingle-slips have sometimes formed where the old vegetation has been burnt out. It is difficult, however, to say whether consolidation from shingle-slip to fell-fields is not taking place at an equal or greater rate in neighbouring localities.

**The Nothofagus Cliffortioides Forest.**

The forest of the Ada Valley may be taken as typical of this association. I therefore transcribe my notes upon it, with a few omissions. The river-flats have to a large extent been denuded of forest, and that on the sides of the valley has been much burnt and run through by stock. At its margin the ground-floor is covered to some extent with introduced herbage; native plants, however, occur, such as Brachycome Sinclairii, Erechtites prenanthoides, Hydrocotyle novae-zelandiae. As we go further in we find a large number of young beeches, showing that the forest tends to replace itself. Amongst them are often plants of Oremyrhhis, Asperula perpusilla, &c., and many introduced weeds. Elytranea tetrapetala is also abundant amongst the foliage of the southern-beech forest. Here the largest beeches have only a diameter of 6 in., and doubtless replace the primeval forest, which has been destroyed by fire perhaps thirty years ago. The forest-floors where otherwise bare is covered with beech-leaves, spread over a rich brown humus, fairly free from stones. There is also abundant upon it Veronica cremosa var. canterburyensis (Armstrong). In more open spaces Epilobium pubens and Helichrysum bellidioides appear. As we go deeper

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* I am using, at Dr. Cockayne's suggestion, the term "southern beech" (Nothofagus) to distinguish our forests from the beech (Fagus) forests of the Northern Hemisphere.
into the forest the introduced grasses disappear, the forest-floor becomes damper, and moss appears on it. The bush is still fairly open; distances of 10 ft. to 12 ft. often occur between neighbouring trees. Here are patches covered with a carpet of moss, with young beeches growing through. Blechnum penna marina, Coprosma ramulosa, and occasional plants of C. virescens? now appear, with here and there a young plant of Nothofagus arboreum. Through all this portion of the forest cattle have been running.

In passing into the portions of the forest which stock have not destroyed, the undergrowth becomes denser, but still consists of beeches in all stages of development. Corysanthes triloba, Adenochilus gracilis, and Chiloglottis cornuta are now to be found. As we ascend from the river-flat, which is well covered with soil, the forest now becomes stonier; the trees become larger, but many of the larger ones (1 ft. to 2 ft. in diameter) have fallen from some undetermined cause. About a quarter of a mile from the margin a band of Nothofagus Menziesii is found, while occasional plants of Senecio bellidiioides appear on the mossy floor, Veronica vernicosa becomes more abundant, and a few specimens of Coprosma linariifolia appear. Here the edge of a bush-creek is fringed with Muehlenbeckia axillaris, growing into long overhanging sprays, giving the plant a very different appearance from its river-bed form. Nothofagus fusca, in clumps, is found higher up the river-flat; but neither it nor N. Menziesii altogether replace the N. chilfortiioides, which probably forms the greater bulk of the forest on to its upper margin. This, at least, was the case in Glacier Valley, where it passes up into Gaya Lyallii; but the upper limit of the forest was not examined in the Ada Valley. This may be placed at 800 ft. to 1,000 ft. above the bed of the valley, and the sides are so steep that they are often swept by avalanches of stones, which carry away the beech-trees. Their place is taken by plants of the shingle-fan, and the beeches grow into this vegetation from the sides, and probably in course of time will reoccupy the whole area.

Sphagnum Bog at the Head of the Ada Saddle.

The upper portion of the Ada Saddle is a flat open valley about 300 yards wide, with English pasturage (cocksfoot, Yorkshire fog, clover, sorrel, musk, &c.) and southern beech (Nothofagus chilfortiioides) forest of a similar type to that described in the Ada Valley some 500 ft. below. Aristotelia fruticosa, Azorella trifoliolata, and Acacia Sanguisorbae occur on the forest-floor, along with many of the plants already mentioned.

The head of the saddle is occupied by a Sphagnum bog about 200 yards square, which divides the eastern and western watersheds. A small pond appears in the centre of the bog. The edges are fringed with Dracophyllum uniflorum, Podocarpus nivalis, Phyllocladus alpinus, and Dacrydium Bidwillii. The bog is evidently rising, as in many places the Dracophyllum is being buried. The Sphagnum is dotted with cushions of Oreobolus pectinatus and O. strictus, and clumps of Celmsias longifolia var. alpina. Round the edges are Ourisia macrophylla, Celmsia coriacea and C. spectabilis, Helichrysum bellidiioides, Miroseris Forsteri, Senecio lagopus, Schizelema nitens, and Pratia angulata. Other species growing in some quantity on the bog are Caladenia bijolia, Rostokia gracilis, Elaeocarhis Cunninghamia, Schoenus pauciflorus, Carex stellulata, C. Gaudichaudiana, Cardamine heterophylla, Forstera Bidwillii, and Drosera arcturi.
I append some notes on forms of special interest, and a list of species gathered.*

FLORISTIC NOTES.

1. Gunnera densiflora (?) Hook. f.

There occurs in the forest of southern beech on the western side of Lake Tennyson and on the margin of the lake a species of *Gunnera*, which is probably the imperfectly described *G. densiflora* Hook f.† The plant grows in considerable abundance on a sloping bank at the water's edge. It agrees fairly well in character with the description of *G. densiflora*. The following is a fuller description:—

*Gunnera* sp., with short succulent rhizome, herbaceous, creeping, rooting at the nodes, with rather stout villous stolons, 7 cm. to 10 cm. long. Leaves clustered at the nodes. Petioles stout, with rather short silky hairs, somewhat flattened, 4 cm. to 6 cm. long. Petioles stout, with rather short silky hairs, somewhat flattened, 4 cm. to 6 cm. long, straight or recurved. Blades cordate, reniform to orbicular, 2 cm. to 3 cm. wide, glabrous or with a few white or brown hairs on the margin and midrib, sharply dentate to dentate-sinuate, auricles bent upwards towards the upper surface of the leaf, though not pressed to it, veins distinct, palmate. Flowers monoecious, in simple spikes, which are usually unisexual, but occasionally a few female flowers are found at the base of the male spike. Male spike 4 cm. to 7 cm. long, ascending from the axil of the leaf, the peduncle usually shorter than the fertile portion, and covered with a soft woolly pubescence. Flowers shortly pedicellate, provided with a minute linear acute bract, 2 mm. to 3 mm. long, arising from the base of the pedicel, and 2 minute linear-sepals smaller than the bract. Petals 2, linear-spatulate, larger than the bracts, hooded with blackish scarious tips, 3 mm. to 5 mm. long. Stamens 2 or 3, filaments shorter than the anthers, anthers ellipsoid, 2-celled. Female flowers sessile, densely crowded with bract, as in the male, calyx-lobes 2, deltoid, apiculate, petals wanting, fruiting-spike elongating to 3 cm. to 5 cm., and covered with villous brownish pubescence. Fertile drupes 2 mm. to 3 mm. long, rather sparse, pyriform, sessile or shortly pedicellate, crowned by the persistent calyx-lobes.

Mr. Cheeseman has drawn my attention to the fact that the plant is perhaps identical with Tasmanian *G. cordifolia* Hook f. (Benth., Fl. Austral., 2491; *Milligania cordifolia* Hook. f. in Ic. Plant., t. 299). This is more fully described by Schindler in his monograph on *Gunnera* in the Pflanzenreich. The description in the "Icones Plantarum" is very imperfect, and differs from that given by Schindler in several important points. Schindler, also, has not seen the mature drupes, and his account of them in this key to the species is not consistent with that given in the specific description. Doubtless the identity or otherwise of the two species cannot be determined until a definite description of the fruit of the Tasmanian plant is obtained. If the description of the Tasmanian species in the Pflanzenreich is to be relied on, the drupe is ovoid and costate. The drupe in my plants is pyriform, rounded, and without costae. My description was drawn up on the spot from fresh specimens, of which there was abundance.

* My thanks are due to Dr. Cockayne and Messrs. Cheeseman and Petrie for much kind assistance, freely given, in the identification of the species.

† Handbook N.Z. Flora, p. 68.

3—Trans.
The following minor differences appear to exist between the New Zealand and Tasmanian forms: in G. cordifolia the petioles are shorter than the lamina, in G. densiflora (?) they are longer. The blade in the Tasmanian plant is more triangular and less rounded than in the New Zealand one, much more hairy on the margin, and the stolons have much shorter internodes. The male spikes of the one seem, however, to agree well with those of the other, and the general resemblance is undoubted. It will, however, be better to regard our plant as distinct until better evidence of identity is obtained.

Mr. Cheeseman informs me that my plant is distinct from that collected by Dr. Cockayne on the Craigieburn Mountains, and identified by the Kew authorities as G. densiflora Hook. f. I have, unfortunately, seen no specimens of Dr. Cockayne's plant.

I have deposited a specimen in the Canterbury Museum.

2. Anisotome Enysii (T. Kirk) Laing (comb. nov.).

Cockayne and Laing (loc. cit.) have restored the genus Anisotome for the southern species of Ligusticum; hence the necessity for this alteration, and the following.

3. Anisotome Enysii (T. Kirk) Laing (comb. nov.) var. tennysonianum Laing.

Folii pinnatis, ambitu deltoideo-ovatis, pinnis inferioribus trifoliolatis, foliolis minus argute dentatis minus crassisque, quam in forma typica, latioribus autem rotundioribusque.

I have hesitated whether to describe this plant as a fresh species or only as a variety of A. Enysii. I have adopted the latter course, because on examining specimens of A. Enysii from Central Otago and Banks Peninsula I find that they differ considerably, and probably contain more than one elementary species. Further, I have not seen any type specimens of A. Enysii from Castle Hill, and consequently cannot be sure that any of my species truly represent the original type. Until, therefore, the limits of the species A. Enysii are better defined it will perhaps be safer to include this under it as a variety.

A. Enysii from the Lyttelton Hills is a dwarf chasmophyte with minute linear involucral bracts, united only at the base, and with well-marked ridges on the fruit. A second form is found growing in the turf on the Akaroa - Flea Bay ridge; the pinnae are more distant, the whole plant is taller and laxer than the Lyttelton one, and the involucral bracts are usually free.

In the plants from Naseby given me by Dr. Petrie the toothing of the leaves is less sharp and less deep than in the other forms, and the terminal segment is broader and rounder, whilst the involucral bracts are usually sheathing, as described by Cheeseman. When such differences as these exist in the forms already grouped under A. Enysii it seemed unwise to make a fresh species of this plant, particularly as it was found in only one locality, in the upper river steppe on the western side of Lake Tennyson. Though differing markedly from A. Enysii in the form of the leaf, the floral characters present only slight variations. A fuller description is appended.

A. Enysii var. tennysonianum.

A small spreading plant 5 cm. to 15 cm. high, with stout tap-root. Leaves subcoriaceous, glaucous, glabrous, aromatic, pinnate, with lower
pinnae ternately divided, upper ternately lobed, the whole leaf deltoid-ovate in outline. Petiole as long or longer than the blade, terete, strait, with short broad membranous sheath, 6 mm. broad at the base. Lower petiolules 10 mm. to 15 mm. long, upper shorter, ultimate divisions broadly-cuneate, flabellate, dentate, teeth subacute not piliferous. Flowering-stems, several, compound, much exceeding the leaves. Peduncles with 1 or 2 bracts, the lower, if present, one-third of the distance from the base, usually with 3 linear lobes and a broad clasping base, upper bract set midway on the peduncle and smaller. Umbels compound, primary rays 2–3, with a simple linear bract at the base of each ray. Secondary rays 5–7, somewhat unequal, pedicels rather longer than the fruit, 1–5 mm. to 2–5 mm. Fruit surrounded with an involucre of small linear acute bracts. Head heterogamous, the central florets generally male, the outer hermaphrodite. Calyx of 5 lobes, teeth deltoid, acute, minute. Petals white. Styles subulate, equaling the ovary in length, slightly recurved, fruit ellipsoid, carpels with 5 equal ridges.

On the upper river steppe, Mount Princess, above Lake Tennyson; altitude, about 3,500 ft.

A specimen is deposited in the Canterbury Museum.


A hitherto-undescribed species from Lake Tennyson, now named by Cheeseman.

5. Haastia pulvinaris var. minor Laing (var. nov.).

In omnibus partibus minor quam typus; rami unae tubifoliis 6 mm. usque ad 15 mm. lati. Pappi capilli non supra incrassati, magis autem scabridi, pene fimbrati.

Two distinct forms of this species appear on Mount Princess (alt. 5,000 ft. to 6,000 ft.). The smaller form is apparently distinguished by the pappus hairs being scabrid, almost fimbriate at the tips, and not thickened as in the typical form. The tomentum of this variety in the specimens we got is much whiter than that in the normal variety.

A specimen is deposited in the Canterbury Museum.


Two forms of this variety were observed, one with the leaf nearly glabrous on both surfaces, and the other with margins covered with a fulvous pubescence. The leaves in the glabrous form are often cordate at the base, and are broader and shorter than in the form with marginal pubescence.

Fell-field, Glacier Gully; about 4,000 ft.

7. Gnaphalium nitidulum Hook. f.

Specimens of a species of Gnaphalium were collected on the upper river steppe of the Clarence Valley, at an altitude between 3,000 ft. and 4,000 ft. It appeared to me to agree fairly well with G. nitidulum in its characters, a plant that has not been collected since first obtained by Travers fifty years ago. I sent a specimen of it to Mr. Cheeseman, who thus reports upon it:—

"No. 1750. Gnaphalium sp.—The female florets are many times more numerous than the hermaphrodite, and the pappus hairs are very numerous, scabrid at the base, and the achenes are faintly downy. These characters place the plant in the genus Gnaphalium. The leaves are about \( \frac{1}{2} \) in. long,
linear-oblong, obtuse, lower \( \frac{1}{2} \) thin and membranous, upper \( \frac{3}{4} \) densely covered with white felted tomentum. The heads are sunk among the uppermost leaves, and are about \( \frac{1}{2} \) in. diameter. It matches the description of *G. nitidulum*, except in the size of the heads, which are given as \( \frac{1}{4} \) in. broad, on very short slender peduncles. But in the allied *G. Traversii* the involucral scales spread after the fall of the florets, making the heads in that state look very much larger than they do in flower, at which time the scales are erect. Hooker's specimens of *G. nitidulum* were evidently past flower, for he says 'florets not seen.' I think it is very likely to prove to be *G. nitidulum*; but specimens should be sent to Kew for comparison with the type."

I have sent specimens to Kew, *and* deposited a fragment in the Canterbury Museum.

**LIST OF SPECIES.**

**Pteridophyta.**

**Filices.**

*Hymenophyllum multiscidum* (Forst. f.) Sw.
*Wilosetum* Col.
*Cystopteris fragilis* (L.) Bernh.
*Adiantum diaphanum* Blume.
*Pteridium aquilinum* L. var. *esculentum* Forst. f.
*Blechnum capense* (L.) Schlecht.
*Penna marina* (Poir.) Kuhn.
*Asplenium flabellifolium* Cav.
*Hookerianum* Col.
*Polypodium pumilum* (J. B. Armstrong) Cockayne
*Ophioglossum lusitanicum* L.

**Lycopodiaceae.**

*Lycopodium fastigiatum* R. Br.
*Scariosum* Forst.
*Volubile* Forst. f.

**Spermatophyta.**

**Taxaceae.**

*Podocarpus nivalis* Hook.
*Dacrydium Buxberris* Hook. f.
*Phyllocladus alpinus* Hook. f.

**Gramineae.**

*Hierochloe redolens* (Forst. f.) R. Br.
*Fraseri* Hook. f.
*Trisetum antarcticum* (Forst. f.) Trin.
*Youngii* Hook. f.
*Danthonia Raoulii* Steud.
*Flavescens* Hook. f.
*Australis* Buch.
*Semiannularis* R. Br.
*Poa Colensoi* Hook. f.
*Kirkii* Buch.
*Imbecilla* Forst. f.
*Caespitosa* Forst. f.

*The Kew authorities now (March, 1912) report the specimen forwarded to be identical with the type of *G. nitidulum.*
Koeleria Kurtzii Hack.
Festuca ovina L. var. novae-zelandiae Hack.
Agropyron seahrum (R. Br.) Beauv.

Cyperaceae.

Elaeocharis Cunninghamii Bocck.
Carpha alpina R. Br.
Schoenus pauciflorus Hook. f.
Oreobolus pectinatus Hook. f.
strictus Berggr.
Uncnma uncinata (L. f.) Kükenh.

cus-vaginata Kükenh.
rubra Boott.
leptostachya Raoul.
Carez stellulata Good.
Gaudichaudiana Kunth.
ternaria Forst. f.
Raoulii Boott.
Petriei Cheesem.

cida Boott.

testacea Sol. A very aberrant form, or new (D. Petrie).
Sinclairii (? C. B. Clarke. Immature.
Rostkovia gracilis Hook. f.
Lusula campestris D.C.
Juncus novae-zelandiae Hook. f.

Naiadaceae.

Potamogeton Cheesemanii A. Benn.

Liliaceae.

Astelia montana (T. Kirk) Cockayne.
Phormium Cookianum Le Jolis.
Chrysobactrum Hookeri Col.

Orchidaceae.

Thelymitra longifolia Forst. f.
Microtis unsifolia (Forst. f.) Reichenh.
Prasophyllum Coenaeoi Hook. f.
Pterostylis Banksii R. Br.
Caladenia Lyallii Hook. f.
 bifolia Hook. f.
Chiloglotis cornuta Hook. f.
Adenochilus gracilis Hook. f.
Corysanthes triloba Hook. f.
Gastrodia Cunninghamii Hook. f.

Fagaceae.

Notholagus olifortioides (Hook. f.) Oerst.

cus (Hook. f.) Oerst.

Menziesii (Hook. f.) Oerst.
Urtica uncata Poir.

Urticaceae.

Loranthaceae.

Elmctracthe tetrapetala (Forst. f.) Engl.

flavida (Hook. f.) Engl.

Santalaceae.

Ezocarpus Bidwillii Hook. f.

Portulacaceae.

Claytonia australasica Hook. f.

Montia fontana L.

Caryophyllaceae.

Stellaria Roughii Hook. f.

Colobanthus Billardieri Fenzl. var. alpinus T. Kirk.

acicularis Hook. f.

Scleranthus biflorus Hook. f.

Ranunculaceae.

Clematis australis T. Kirk.

Ranunculus insignis Hook. f.

Monroi Hook. f.

Monroi Hook. f. var. dentatus T. Kirk.

Sinclairii (?) Hook. f. Identification not certain in the absence of flowers and fruit.

sp. Scarcely possible to identify in the absence of flowers and fruit.

hirtus Banks & Sol.

lappaceus Smith.

foliosus T. Kirk.

rivularis Banks & Sol.

Cheesemani T. Kirk. This is perhaps only a hygrophytic form of

R. foliusus It is everywhere abundant throughout the district, in pools and slow-running water.

Cruciferae.

Cardamine heterophylla (Forst. f.) Schultz var. micrantha Schultz.

heterophylla (Forst. f.) Schultz var. uniflora Hook. f.

depressa Hook. f.

fastigate Hook. f.

Euphorbia Cheesem.

Notothlaspi rosulatum Hook. f.

austrole Hook. f.

Droseraceae.

Drosera arcturi Hook.

Crassulaceae.

Crassula Sieberiana Schultz.

Pittosporaceae.

Pittosporum patulum Hook. f.
Rosaceae.

Rubus australis Forst. f.
    schmideloides A. Cunn. var. coloratus T. Kirk.
    subpauuperatus Cockayne.
    parviflorum Smith.
Potentilla anserina L. var. anserinoides (Raoul) T. Kirk.
Acana Sanguisorbae Vahl. var. pilosa T. Kirk.
    mermis Hook. f.
    inermis Hook. f. var. longiscapa Bitter.
    microphylla Hook. f.
    glabra Buch.
    adscendens (?) Hook. f. non Vahl.

Leguminosae.

Carmichaelia subulata T. Kirk.

Geraniaceae.

Geranium microphyllum Hook. f.
    molle L.
Oxalis corniculata L.
    magellanica Forst. f.

Coriariaceae.

Coriaria ruscifolia L.
    thymifolia Humb. & Bonp.
    angustissima Hook. f.

Stackhousiaceae.

Stackhousia minima Hook. f.

Rhamnaceae.

Discaria toumatou Raoul.

Elaeocarpaceae.

Aristotelia fruticosa Hook. f.

Malvaceae.

Gaya ribifolia (F. Muell.) Cockayne.
    Lyallii (Hook. f.) Baker.

Violaceae.

Viola Cunninghhamii Hook. f.
Hymenanthera dentata R. Br. var. angustifolia Benth.

Thymelaeaceae.

Pimelea Traversii Hook. f.
    Lyallii Hook. f.
    sericeo-villosa (forma) Hook. f.
    Suteri (?) T. Kirk.
Droopes villosa Cheesem. var. multiflora Cheesem.

Myrtaceae.

Leptospermum scoparium Forst.
    ericoides A. Rich.
Epilobium palludiflorum Sol.
Billardierianum Ser.
junceum Sol.
pubes A. Rich.
tasmanicum. Haussk.*
pictum Petrie.
tenuipes Hook. f.
alsinoides A. Cunn.
linnacoides Hook. f.
nunnularifolium R. Cunn.
maccropus Hook.
gracilipes (?) T. Kirk.
erasum Hook. f.
vernicosum (?) Cheesem.
microphyllum A. Rich.
glabellum Forst.
novae-zelandiae Haussk.
pycnostachyum Haussk. This was collected by Cheeseman at Lake Tennyson, but not collected by us.

Halorrhagaceae.

Halorrhagis depressa Walp.
Gunnera densiflora (?) Hook. f.†
dentata T. Kirk.

Araliaceae.

Notopanax arboreum (Forst. f.) Seem.

Umbelliferae.

Hydrocotyle novae-zelandiae D.C.
asiatica L.
Schizeilema Roughii (Hook. f.) Domin.
pallidum (T. Kirk) Domin.
trifoliolatum (Hook. f.) Domin.
nitens (Petrie) Domin.
Oreomyrrhis andicola Endl. var. Colensoi (Hook. f.) T. Kirk.
andicola Endl. var. ramosa (Hook. f.) T. Kirk.
Aciphylla Colensoi Hook. f.
squarrosa Forst.
Monroi Hook. f.

Anisotome Haastii (F. Muell.) Cockayne and Laing.
filifolia (Hook. f.) Cockayne and Laing.
carnosula (Hook. f.) Cockayne and Laing.
aromatica Hook. f.
imbricata (Hook. f.) Laing.
Blyea (T. Kirk) Laing var. tennysonianum (Laing).
pilifera (Hook. f.) Cockayne and Laing.
Angelica Gingidium (Forst. f.) Hook. f.
var.‡
decipiens Hook. f.

* Here used to include the New Zealand forms of the subantarctic E. confertifolium.
† Vide "Floristic Notes."
‡ A very distinct shingle-slip form (or new species), of which, however, only one specimen was obtained. It is therefore not further described at present.
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Cornaceae.

Corokia Cotoneaster Raoul.
Griselinia littoralis Raoul.

Ericaceae.

Gaultheria antipoda Forst. f.
rupestris R. Br.

Epacridaceae.

Pentachondra pumila (Forst. f.) R. Br.
Styphelia acerosa Sol.
Colensoi (Hook. f.) Diels.
fasculata Forst. f.
Fraseri (A. Cunn.) F. Muell.

Dracophyllum rosmarinifolium (Forst. f.) R. Br.
uniflorum Hook. f.

Gentianaceae.

Gentiana corymbifera T. Kirk.
patula (T. Kirk) Cheesem.
bellidifolia Hook. f.
divisa (T. Kirk) Cheesem.. var. magnifica T. Kirk.

Borraginaceae.

Myosotis australis R. Br.
Forsteri Lehm.
Traversii Hook. f.
lacta Cheesem.
macrantha Hook. f.
Laingii Cheesem.

Labiatae.

Mentha Cunninghamia (A. Cunn.) Benth.

Scrophularinaceae.

Mazus radicans (Hook. f.) Cheesem.
Veronica subalpina Cockayne.
dergens f Cheesem.
salixifolia Forst. f.
vernosa Hook. f. var. canterburiensis Armstr.
buxifolia Bentham.
buxifolia Bentham. var. patens Cheesem.
cupressoides Hook. f.
epacridia Hook. f.
macrantha Hook. f.
Raoulii Hook. f.
pulvinaris Hook. f. & Benth.
linifolia Hook. f.
catarraeae Forst. f. var. lanceolata Hook. f.
Lyallii Hook. f.
Bidwillii Hook.
decumbens Armstr.
pinguiifolia Hook. f.
leiophylla Cheesem.
Gilliesiana T. Kirk.
lycopodioides Hook. f.
Haastii Hook. f.
Ourina macrophylla Hook. f.
caesiplosa Hook. f.
Euphrasia Monroi Hook. f. Thus listed by us, but perhaps E. Laniqua
Petrie.

Lentibulariaceae.

Utricularia novae-zelandiae Hook. f.

Plantaginaceae.

Plantago Raoulii Decne.
Brownii Rapin.
spathulata Hook. f.
lanigera Hook. f.

Rubiaceae.

Coprosma serrulata Hook. f.
rhamnoides A. Cunn.
parvisflora Hook. f.
ramulosa Petrie.
virens (?) Petrie.
brunnea (T. Kirk) Cockayne.
propinqua A. Cunn.
linarifolia Hook. f.
repens Hook. f.
Petriei Cheesem.
Gaultheria tenuicaule A. Cunn.
umbrosum Sol.

Campanulaceae.

Pratia angulata (Forst. f.) Hook. f.
macrodon Hook. f.
Lobelia Roughii Hook. f.
Wahlenbergia cartilaginea Hook. f.

Stylidiaceae.

Phyllachne clavigera F. Muell.
Colensoi Berggr.
Forstera Bidwillii Hook. f.

Compositae.

Lagenophora petirolata Hook. f.
Barkeri T. Kirk.
Brachycome pinnata Hook. f.
Thomsonii T. Kirk var. membranifolia (?) T. Kirk.
Sinclairii Hook. f.
Olearia cymbifolia (Hook. f.) Cheesem.
avicenniaefolia Hook. f.
virgata Hook. f. Forma with rigid branches and spiny branchlets.
Celmisia Walkeri T. Kirk.
lateralis Buch.
discolor Hook. f.
incana Hook. f.
incana Hook. f. var. petirolata T. Kirk.*
petirolata Hook. f. var. membranacea T. Kirk.

* Vide "Floristic Notes."
Celmisia cornea Hook. f.
  longifolia Cass. Shingle-slip form.
  longifolia Cass. var. alpina T. Kirk.
  tenuifolia Hook. f.
  bellidioide Hook. f.
  viscosa Hook. f.
  sessiliflora Hook. f.
  spectabilis Hook. f.

Vittadinia australis A. Rich.

Haastia pulvinaris Hook. f.
  pulvinaris Hook. f. var. minor Laing.*

Gnaphalium Traversii Hook. f. var. Mackayi Buch.
  nittidulum Hook. f.*
  luteo-album L.
  collinum Labill.

Raculba australis Hook. f.
  apice-nigra T. Kirk.
  tenuicaulis Hook. f.
  eximia Hook. f.
  Monroi Hook. f.
  glabra Hook. f.
  grandiflora Hook. f.
  bryoides Hook. f.

Helichrysum bellidioide (Forst. f.) Willd.
  grandiceps Hook. f.
  depressum Hook. f. (Benth. & Hook. f.).
  microphyllum Hook. f. (Benth. & Hook. f.).

Selago (Hook. f.) Benth. & Hook.

Cassinia albida (T. Kirk) Cockayne.
  fulvida Hook. f.

Craspedia uniflora Forst. f.
  alpina Backhouse.

Otulua atrata Hook. f.
  atrata. Forma with brown florets.
  squalida Hook. f.
  dioica Hook. f.

Erectites prenanthoides D.C.
  scaberula Hook. f.
  glabrescens T. Kirk.
  quadridentata D.C.

Senecio lagopus Raoul.
  bellidioide Hook. f.
  Lyallii Hook. f.
  scorzoneroide Hook. f.
  cassinioides Hook. f.
  Bidwillii Hook. f.
  geminatus T. Kirk.

Microseris Forsteri Hook. f.

Taraxacum glabratum (Forst. f.) Cockayne.

* Vide "Floristic Notes."