

THE FLOWERING PLANTS AND FERN-ALLIES OF THE CAIRNGORMS.

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THE late Mr. John Roy, LL.D., contributed various lists of plants to separate monographs on the mountains of the Cairngorm region. These it was his intention to combine, and possibly to extend into a more general list to appear in this Journal; but his death prevented him from putting his intention into execution. I have pleasure in complying with the request that has been made to me that I should carry out the design, though I cannot lay claim to the same familiarity with the botany of the region that Dr. Roy possessed.

The flora of our mountains is chiefly composed of two very different groups of plants. The one consists of kinds that grow more or less plentifully on heaths and moorlands, or on grassy meadows, from the sea-level to a considerable height on the mountains, or that may even reach their summits. The other includes kinds that are confined to high altitudes, or that, if found at lower levels, are restricted to the banks of rivers, such as the Dee, the Spey, and their upper tributaries, by which seeds, or, less often, uprooted plants, are carried down to the spots on which the plants are found in the lowlands. A good many plants are more or less intermediate between these groups, inclining towards the one or the other. A few show the remarkable peculiarity of growing at comparatively high altitudes on the mountains and also on rocky sea coasts, but not in the intermediate districts. As examples may be named, the Rose-root Stonecrop (*Sedum Rhodiola*), which grows in various localities from 2500 feet upwards, and also near the Bullers of Buchan on the coast; the Purple Mountain Saxifrage (*Saxifraga oppositifolia*), not scarce on the higher hills, and again occurring on rocks at Aberdour on the coast; and the Common Thrift (*Armeria maritima*).

Possibly such peculiarities of distribution may be explained by the plants in both localities finding the competition with other plants for food and space less severe in their favourite haunts than elsewhere.

The characteristic Arctic or Alpine plants of our highlands, *i.e.*, those that are confined (except along the banks of rivers) to high altitudes on the mountains, have long exercised a great fascination over botanists, and have been the prizes sought in many a long and weary tramp; but most of them are limited in their distribution, and must be sought for in their chosen habitats. Not a few are far too rare to fall under the eye of any but the most experienced in the search for them, and the search leads one at times into situations where a slip or any want of care might lead to disastrous results. Few that have looked for our Alpine plants can fail to recall experiences more pleasant to look back on than to pass through, and of which the herbarium brings back lively recollections. Most of the more characteristic Alpine species grow in the higher corries on broken ledges of rock, especially where the soil is kept moist, though not actually wet, by trickling water. They are, however, peculiar in their distribution, certain localities being very rich in such plants, while others that appear at first sight more suited to them are very unproductive. A good example of such apparent capriciousness is afforded by Little Craigandal (Creag na Dala Bige), on which, at from 2400 to 2800 feet above the sea level, on a rather bare slope with broken rocks, there is an exceptionally rich Alpine flora, richer than on any similar area of the higher Cairngorms. The Alpine plants prefer corries or slopes that face the north, or from north-east to north-west. Direct exposure to the south seems to make the slopes too dry. Some species of more general occurrence grow on the bare hill tops, either on the drier places or wherever a moister soil or marshy depression occurs.

Any account of the botany of the Cairngorm district would be very defective unless it included, in addition to the Alpine plants, a notice of the species that, while often plentiful on lowland moors and meadows, form a very con-

spicuous part of the vegetation of the mountains also. Often, indeed, by far the most conspicuous part of the latter vegetation consists of such plants, several of which reach greater altitudes on our Scottish mountains than do most of the Alpine plants themselves. Some of these plants of wide range show no recognisable difference between examples from the upper limits and those from the lowlands, except, possibly, less vigorous growth, due to poorer soil and to exposure. As examples may be mentioned the Blaeberry (*Vaccinium Myrtillus*) and the Crowberry (*Empetrum nigrum*). Others show well-marked forms or varieties in the upper part of their range, e.g., the Marsh Marigold (*Caltha palustris*), of which the form from high elevations differs so much as to receive a name as a variety (*minor*). The higher Cairngorm mountains cannot be called rich in the more strictly Alpine plants, especially if compared with the Lochnagar group, among which Glen Callater, Canlochan, and Clova have for many years been noted for the richness of their Alpine flora. In the subjoined enumeration are included several plants that do not form a part of the mountain flora, but that occur in the sub-Alpine or lowland portions of the district, especially in the valley of the Spey, and that are of interest from either their limited distribution or some other cause. None of the weeds confined to cultivated soil is mentioned, nor the common lowland plants that do not rise high enough to be noteworthy in the mountain vegetation, except a few that are included to call attention to their limits of altitude. The more characteristic Alpine and upland plants have their botanical names printed in more conspicuous type, e.g., **Thalictrum alpinum**, L. The altitudes given for the various species are not necessarily those at which they have been found on the Cairngorm mountains, but are those at which the species have been observed in Braemar or in neighbouring districts. They serve to indicate the altitudes at which the plants may be looked for.

In the preparation of this list, I have made use of all the information I could obtain, including Professor Dickie's "Botanist's Guide to the Counties of Aberdeen, Banff, and

Kincardine", Dr. Roy's lists already referred to, and articles in the *Journal of Botany*, the *Scottish Naturalist*, and elsewhere, by various botanists.

- Thalictrum alpinum**, L. Alpine Meadow Rue. Widely distributed, though not abundant, and easily overlooked; between 1600 and 3000 feet.
- Ranunculus Flammula**, L. Lesser Spear-wort. Frequent in marshy places up to 2500 feet; often passing into the creeping form on the shores of lochs and shallow pools. *R. petiolaris* (Marshall), a recently-defined form, is recorded by Mr. G. C. Druce from the stony margin of Loch Morlich.
- R. acris**, L. Meadow Crowfoot or Buttercup. On grassy places up to nearly 3000 feet; at higher altitudes the variety *pumilus* (Wahl.), occurs, but near Castleton, in the valley of the Dee, it is usually the variety *Boraeanus* (Jord.).
- Caltha palustris**, L. Marsh Marigold. Along streams up to 3500 feet, passing into the form *minor* at upper altitudes.
- C. radicans**, Forst. Is recorded by Mr. G. C. Druce from near Loch Morlich. It is a very local and rare plant.
- Trollius europæus**, L. Globe Flower. Rises to over 3000 feet above the sea, and occurs here and there in the district.
- Nuphar minimum**, Sm. (*N. pumilum*, Sm.) Small Yellow Waterlily. Grows in two or three of the lochs on Speyside.
- Arabis petraea**, Lam. Alpine Rock Cress. On most of the Cairngorm mountains up to 3000 feet, and extending downwards along the streams nearly to the sea level. The variety *hispida*, D.C., has been met with on Cairngorm.
- Draba rupestris**, R. Br. Rock Whitlow Grass. On Cairngorm at about 3000 feet.
- Subularia aquatica**, L. Awl-wort. In Loch Avon and Loch Morlich, and probably in other lochs of the Cairngorms.
- Cochlearia officinalis**, L., *alpina* Grufb. Alpine Scourvy Grass. Not uncommon, though local, at high altitudes on several of the mountains.
- Viola palustris**, L. Marsh Violet. Not uncommon in marshy hollows up to 4000 feet, flowering in early summer.
- Viola lutea**, Huds. Mountain Violet. This large-flowered violet replaces on the mountains, from 1500 to 2600 feet, the common Heart's-ease or Pansy Violet of the lowlands, but it also extends downwards to 400 feet above the sea level. Its flowers are yellow or purple.
- Polygala vulgaris**, L. Milkwort. Is common in most natural pastures from the sea level up to over 2500 feet, usually as the form *serpyllacea*, Weihe, at the higher elevations. Its flowers show a wide range of colour, from white to deep blue and to deep red, with a great variety of intermediate shades.
- Silene acaulis**, L. Moss Campion. Forming moss-like cushions, covered

- during summer with its bright red flowers. It is common on most mountains from about 2200 to 4300 feet.
- Lychnis diurna*, Sibth. Red Campion. In shady places from sea level up to 3500 feet, but local.
- Cerastium*. Mouse-ear Chickweeds. This genus includes a considerable number of species in our flora. They are so much alike as to render their recognition as species no easy task. Certain forms—*C. arcticum*, Lange, *C. alpinum*, L., *C. trigynum*, Vill.—are confined to high altitudes, 1500 to 4000 feet above sea level, where they may be found on most of the Cairngorms. Others—*C. glomeratum*, Thuill., *C. triviale*, Link,—range from the sea level to about 3000 feet above it. *C. triviale*, var. *alpestre*, Lindb., has been found in Glen Eunach.
- Stellaria uliginosa*, Murr. Bog Stitchwort. Occurs from the sea level up to nearly 3000 feet. It frequently forms a part of the green masses of vegetation so common beside streams or around their sources.
- Sagina Linnæi*, Presl. Alpine Pearl-wort. On wet rocks and near streams over 2000 feet, on all the Cairngorms, though not common. It is very inconspicuous, and may be confounded with *S. procumbens*, L., a far more abundant plant, which occurs from the sea level to near 3000 feet.
- S. alpina*, Don. Is recorded by Mr. Druce, as found by himself on steep cliffs in Coire an t-Sneachda, and near the waterfall which enters Glen Avon from Ben Muich Dhui. (It was found by Don on the summit of Ben Nevis, and had not again been found by anyone in Britain.)
- Sagina Boydii*, B. White. Is a peculiar plant found by Mr. W. B. Boyd in Braemar (on Ben Avon?). The description and figure are contained in the *Journal of Botany* for August, 1892.
- Montia fontana*, L. Water Blinks. Usually forms a considerable part of the green cushions of vegetation around springs and beside small streams from the sea level up to 3300 feet, in one or other of its varieties—*minor* (Gmel.) and *rivularis* (Gmel.)
- Hypericum pulchrum*, L. Small Upright St. John's Wort. Common on moorlands up to 2000 feet.
- Linum catharticum*, L. Purging Flax. Common, though rather inconspicuous, on moors and natural pastures up to 1700 feet.
- Geranium sylvaticum*, L. Wood Crane's Bill. Up to 3200 feet. It occurs on Ben Muich Dhui and others of the Cairngorms, but is local though rather common in the lower districts of Deeside.
- Oxalis Acetosella*, L. Wood Sorrel. Among rocks up nearly to 4000 feet. In the lower districts, to the sea level, it is more common in woods. It produces conspicuous but rather barren flowers in spring and early summer, followed in later summer and autumn by inconspicuous flowers that remain very small and do not open, but that give origin to well-developed fruits. When ripe the fruits burst suddenly, and each seed is shot out of an elastic outer coat.
- Genista anglica*, L. Petty Whin. Growing among heather on moors from sea level to 2200 feet, often abundantly.

- (*Ulex europæus*, L. Common Whin. Though not extending to the Cairngorms in Braemar this plant may be mentioned to request that its upper limits both in Braemar and on Speyside should be accurately noted.)
- Cytisus scoparius*, Link. Common Broom. Its upper limits should be noted, and its habit of growth near the limits. A procumbent form grows at a pretty high elevation on Beinn a' Bhuid.
- Lotus corniculatus*, L. Common Bird's-foot Trefoil. Is abundant in most natural pastures from the sea level upwards. It has been noted at almost 2000 feet above the sea.
- Astragalus alpinus*, L. Alpine Milk-vetch. Is plentiful on Little Craigan-dal at about 2200 feet elevation.
- Lathyrus macrorrhizus*, Wimm. Tuberos Bitter-vetch,—with its variety *tenuifolius*,—frequent in pastures from sea level to 2300 feet.
- Rubus Chamæmorus*, L. Cloudberry or Avron. On all the Cairngorms ; often in great abundance on moist heaths, from 2000 to 3800 feet above the sea.
- Dryas octopetala*, L. White Dryas. Here and there on all the Cairngorms between 2400 and 2800 feet elevation.
- Geum rivale*, L. Water Avens. Here and there on moist rocks and beside streams from sea level up to 2500 feet or higher.
- Potentilla rubens*, Vill. (*P. maculata*, Pourr.). Orange Alpine Cinquefoil. In natural pastures here and there from 1300 to 2600 feet.
- P. Tormentilla*, L. Tormentil. Plentiful in natural pastures from the coast upwards, to over 3000 feet altitude. It occurs at 3300 feet on Beinn a' Bhuid.
- P. Comarum*, Nestl. Marsh Cinquefoil. Plentiful in marshes from the sea level. Its upper limits should be noted, as it has not been recorded much above 1400 feet in this district.
- P. Sibbaldi*, Hall f. Sibbaldia. From 1600 to over 4000 feet above the sea, often in great plenty. The inconspicuous greenish-yellow flowers are easily overlooked.
- Alchemilla vulgaris*, L. Ascends from sea level to nearly 3000 feet above the sea, showing at least three varieties.
- A. alpina*, L. Alpine Lady's Mantle. Is one of the most plentiful plants in the sward on our mountains, from about 600 feet above the sea upwards ; and it reaches an altitude of more than 4000 feet. It is usually to be found among shingle beside the Dee almost to Aberdeen, the produce of seeds carried down the river from the hills.
- Rosa*. The wild roses should scarcely be included among the plants of the Cairngorms, though occurring in the glens up to 1200 or 1400 feet. Their upper limits should be noted.
- Pyrus Aucuparia*, Gært. Rowan or Mountain Ash. Is not rare among broken cliffs up to over 2000 feet.
- Saxifraga*. This genus is perhaps the richest in characteristically Alpine plants in our native flora in proportion to its extent, most of our species being especially Alpine in distribution here. Several of these occur on the Cairngorms.
- S. oppositifolia*, L. Purple Mountain Saxifrage. Is abundant on most of

the mountains from about 2200 to over 3000 feet. Its moss-like clumps of leafy stems are covered in May with dark purplish red flowers. It grows also on the sea-coast at Aberdour in the north of Aberdeenshire.

- S. nivalls**, L. Alpine Clustered Saxifrage. Is one of the rarest Alpines in this district, occurring on damp rocks between 2400 and 2800 feet of altitude. Dr. Roy notes it in his Braeriach and Cairn Toul list.
- S. stellaris**, L. Starry Saxifrage. Is one of the most common of mountain plants; its little starry flowers gleaming in almost every moist spot by the waysides, up to over 4000 feet. It occurs as low as 1000 feet; but becomes abundant only at a few hundred feet above that level.
- S. aizoides**, L. Yellow Mountain Saxifrage. May be met with along the rivers from 50 feet above the sea; and in marshy places, from about 600 to over 3000 feet, it is often abundant, flowering in summer.
- S. rivularis**, L. Brook Saxifrage. Is rare and local, on moist rocks at over 3000 feet elevation. It has been found on Cairn Toul.
- S. cæspitosa**, L. Tufted Alpine Saxifrage. Found in 1830, "at the base of the precipice (east side of Beinn a' Bhuid)" by Mr. M'Nab, and in the same year "by Dr. M. Barry, on Ben Avon". Dr. Roy gives the latter locality as "on the west side of Slochd Mor, half-way up the cliffs".
- S. sponhemica**, Gmel. Has been gathered by Mr. Druce in Glen Eunach.
- S. hypnoides**, L. Mossy Saxifrage. May be looked for on moist rocks. It is not rare about the Break-neck Fall in Glen Callater.
- Chrysosplenium alternifolium*, L. Alternate-leaved Golden Saxifrage. Beside streams, very local. It has been found in Glen Eunach. (It grows at Corriemulzie.)
- C. oppositifolium*, L. Opposite-leaved Golden Saxifrage. Common beside streams, from sea level to a considerable elevation. Its upper limit should be noted.
- Parnassia palustris*, L. Grass of Parnassus. In marshes, but local, up to 2700 feet, flowering in autumn.
- Sedum Rhodiola**, D.C. Rose-root Saxifrage. On moist broken cliffs on all the mountains, though local. It grows also on sea-coast cliffs in Buchan.
- Drosera*. Sundews. This genus is represented by two species, *D. rotundifolia*, L., Round-leaved Sundew, and *D. anglica*, Huds., Long-leaved Sundew. Both occur on damp or marshy moors, not unfrequently in plenty, in the lowlands among bog mosses, and reach an elevation of about 2000 feet. *D. rotundifolia* is the more widespread. *D. anglica* is recorded from the bases of Ben Muich Dhui and of Beinn a' Bhuid. The form *obovata*, M. and K., is not uncommon in a small marsh near Boat of Garten.
- Callitriche*. Water Starworts. The species of this rather inconspicuous genus should be looked for in the mountain lochs.
- Epilobium*. Willow Herbs. This genus contains several species that greatly resemble one another. (*E. angustifolium*, L., reaches 3200 feet on Lochnagar, but I have no note of it from the Cairngorms.) *E.*

- montanum*, L., Mountain w.H., is plentiful on banks and waste ground, and *E. obscurum*, Schreb., and *E. palustre*, L., Marsh w.H., in marshy places, all three up to nearly 2000 feet.
- E. alsinefolium**, Vill.—Chickweed-leaved w.H.—and **E. alpinum**, L.—Alpine w.H.—are small alpine species, the latter the wider in range of altitude (1300 to 3800 feet), but both occurring beside springs and rivulets on all the Cairngorms.
- Meum Athamanticum*, Jacq. Highland Micken or Bald Money. Occurs in pastures in the glens of Braemar up to 1500 feet.
- Angelica sylvestris*, L. Wild Angelica. In damp pastures and on moist rocks up to 3200 feet.
- Cornus suecica**, L. Dwarf Cornel. In moist slopes and hollows on all the Cairngorms up to nearly 3000 feet.
- Galium boreale*, L. Northern Bedstraw. Along streams up to 2500 feet.
- G. verum*, L. Lady's Bedstraw. Common on dry banks up to 1800 feet.
- G. saxatile*, L. Smooth Heath Bedstraw. Common in dry places up to 4000 feet.
- G. palustre*, L. Marsh Bedstraw. In damp or marshy places up to nearly 2000 feet; usually common.
- Scabiosa succisa*, L. Devil's-bit Scabious. Common on heaths and in pastures, reaching 2800 feet above the sea level.
- Solidago Virgaurea*, L. Golden Rod. The variety *cambrica* occurs in the lower glens.
- Bellis perennis*, L. Common Daisy. Up to 2500 feet. Note upper limits.
- Erigeron alpinum**, L. Alpine Flea Bane. Rare on moist rocks at from 2400 to nearly 3000 feet. It has been found on all the Cairngorms.
- Antennaria dioica*, R. Br. Mountain Everlasting. Common on most heaths up to over 2000 feet.
- Gnaphalium sylvaticum*, L. Highland Cudweed. Plentiful in some pastures and on heaths, up to nearly 2000 feet.
- (**G. norvegicum**, Gunn. Often regarded as a variety of the last, occurs on Lochnagar, and may be looked for on broken cliffs of the Cairngorms.)
- G. supinum**, L. Dwarf Cudweed. Is one of the most common plants on bare mountain slopes from 1400 feet to over 4000.
- Achillea Ptarmica*, L. Sneezewort Yarrow. } In pastures up to
A. Millefolium, L. Common Yarrow. } about 1500 feet. The
Chrysanthemum Leucanthemum, L. Ox-eye Daisy. } upper limits of each
Matricaria inodora, L. Scentless Feverfew. } should be noted.
- Senecio Jacobaea*, L.—Ragwort—may be met with, usually in drier pastures, up to 2000 feet; and *S. aquaticus* (Huds.)—Marsh Ragwort—among marsh vegetation and by streams in the lower parts of the glens.
- Carduus and Cnicus**. These genera, comprising the various thistles, are much less abundant than in the lowlands, and are confined to the lower glens. *Cnicus palustris*, Willd., the Marsh Thistle, ascends to about 2000 feet; and *C. heterophyllus*, L., Melancholy Plume Thistle, to 3200 feet on Lochnagar.
- Saussurea alpina**, D.C. Alpine Saussurea. Grows on moist ledges of cliffs,

at from 2200 feet upwards to nearly 4000 feet on the Cairngorms, including Little Craiganal.

Hieracium. Hawkweeds. This genus includes a very large number of named forms; but few botanists could undertake to distinguish the "species" with confidence from one another. They are peculiarly mountain plants, and a considerable number have been recorded from the Cairngorm mountains by specialists who have studied them. A list of all the forms known to Mr. F. J. Hanbury (the leading authority on the genus in Britain) to occur in Braemar is contained in the *Scottish Naturalist* for October, 1891, pp. 183-84; but a good many others have been put on record since that date by himself and by the Rev. Messrs. Linton and E. S. Marshall.

Leontodon autumnalis, L. Autumnal Hawkbit. Abundant in pastures from the coast upwards, reaching almost 3000 feet on Ben MuichDhui.

Taraxacum officinale, Web. Dandelion. Plentiful in many places, the variety *palustre*, D.C., reaching 4000 feet elevation.

Lobelia Dortmanna, L. Water Lobelia—which occurs in several of the lowland lochs on Deeside and in Loch Callater, should be looked for in shallow water along the edges of Loch Eunach and the other highland lochs in the Cairngorms. It occurs in several of the lochs in the Speyside part of the district up to Loch an Eilein.

Campanula rotundifolia, L. Common Hairbell or Bluebell. Plentiful in natural pastures and on heaths from the coast upwards, reaching an elevation of 3000 feet. On the hills it often bears only one flower on each stem.

Vaccinium Oxycoccos, L. Marsh Whortleberry or True Cranberry. Very local, in mossy bogs up to 2000 feet. Mentioned in Dr. Roy's list for Braeriach and Cairn Toul, but with (?). Found in Coire Etchan, Ben Muich Dhui.

V. vitis-idaea, L. Red Whortleberry or Cranberry. Plentiful on most heaths from 200 to over 3000 feet altitude. This plant yields most of the "cranberries" gathered in Scotland.

V. uliginosum, L. Bog Whortleberry. Very local, in bogs, at altitudes of from about 1800 to 3500 feet in this district, in marked contrast to its abundance down nearly to the sea level in the west of Scotland. Noted in Dr. Roy's list for Braeriach and Cairn Toul.

V. Myrtillus, L. Blaeberry. Is one of the most widely diffused and plentiful of our heath plants, ranging from the coast to near the summit of Ben Muich Dhui.

Arctostaphylos Uva-ursi, L. Red Bear-berry. Plentiful on many inland moors from about 200 to 2500 feet elevation.

Calluna Erica, D.C. Common Ling—"Cat Heather"—of this district. Is our most abundant heath up to about 2800 or 3000 feet, but from this elevation it thins out, and does not appear to pass 3300 feet, marking the upper limit of Mr. H. C. Watson's Mid-Arctic zone of vegetation on our mountains.

Erica Tetralix, L. Cross-leaved Heath. Common on swampy moors up to 2000 feet, but not passing 2100 feet usually, thus marking the lower limit of the Mid-Arctic zone.

- E. cinerea*, L. Fine-leaved Heath, or "Purple Bell Heather". Abundant on most dry moors up to about 2000 feet.
- Loiseleuria procumbens*, Desv. Trailing Azalea. Scarcely occurring below 2100 feet, but abundant on dry gravelly places on most hills up to 3500 feet.
- Pyrola secunda*, L. Serrated Winter-green. Local, from 100 up to 2000 feet, in woods and on shady rocks; occasionally met with in the district, e.g., on Little Craigandal.
- P. media*, Swartz. Intermediate Winter-green. Almost from the coast to upwards of 2000 feet above the sea, in woods and on moors; common, but somewhat local; occurring in a good many places, e.g., near Linn of Quoich, Linn of Dee, &c.
- P. minor*, L. Less plentiful than *P. media*, but occurs in the valley of Dee, e.g., north of Castleton.
- Armeria maritima*, Willd. Sea Pink. Here and there on the higher mountains, as well as on the sea coast, showing great differences in the hairiness of the calyx, as noted by Dr. Dickie. The variety *planifolia*, Syme, has been found on Derry Cairngorm and on Little Craigandal.
- Primula vulgaris*, L.—Primrose—is plentiful; and *P. veris*, L.—Cowslip—is common in places, though somewhat local; both of them from the coast, up to 1500 feet elevation.
- Lysimachia nemorum*, L. Wood Loosestrife. Is widespread, and often plentiful in moist, shady places from the coast to nearly 2000 feet.
- (*Trientalis Europæa*, L. Chickweed Winter-green. Common on many heaths in the district from the coast upwards. I have no notes about its occurrence among the Cairngorms, but it probably occurs on them, as it has been found at 3000 feet on Lochnagar. It flowers in May and June.)
- Gentiana campestris*, L. Field Gentian. Common in many natural pastures from the coast up to nearly 2000 feet.
- Menyanthes trifoliata*, L. Buckbean or Bogbean. In marshy pools up to about 1500 feet. Its upper limits should be noted.
- Digitalis purpurea*, L. Foxglove. On waste and rocky slopes up to 1800 feet. Its upper limits should be noted.
- Veronica serpyllifolia*, L. Thyme-leaved Speedwell. Occurs in pastures and on grassy heaths up to over 3000 feet; and the variety *humifusa* (Dickson) is frequent on all the higher mountains.
- V. alpina*, L. Alpine Speedwell. Is found in damp pastures and on moist ledges on all the Cairngorms from 2000 to 3000 feet.
- V. officinalis*, L.—Common Speedwell—and *V. Chamædryis*, L.—Germander Speedwell—both common in natural pastures, from the sea level upwards; reach 2000 feet. The former has been found with hairless leaves at about 1700 feet altitude on the Cairngorms.
- Euphrasia officinalis*, L. Common Eyebright. Is very plentiful in pastures and on moors, growing from the coast up to over 3500 feet. On poor soils and in exposed situations it often is very slender, with small flowers, which vary from nearly white to dark purplish red. [A curious Eyebright, *E. paludosa* (Towns.), has been found on marshy

ground near Castleton, and may occur in the Cairngorm district. It comes nearest the form *gracilis* (Fries).]

Pedicularis palustris, L.—Marsh Lousewort—and *P. sylvatica*, L.—Pasture Lousewort—are plentiful on many moors of the kinds indicated by the names of the plants up to 2000 feet. *P. palustris* has been found at 2800 feet above Glen Callater.

Rhinanthus Crista-galli, L. Yellow Rattle. On most moors and pasture lands up to 1400 feet, or probably higher.

Melampyrum pratense, L. Common Yellow Cow-wheat. Local, but occurring in woods, and less often on moors, up to about 3000 feet. (Found striped in Coire na Ciche of Beinn a' Bhuid. —A.C.)

The five plants last mentioned draw part of their food from neighbouring plants (specially from grasses) by means of suckers produced on the roots of the parasites, and pushed into the roots with which they are in contact.

Utricularia. Bladderwort. This genus includes in this district three species, all living in water, usually in marshy pools, and easily recognised by the small bladders produced on their leaves. *U. intermedia*, Hayne, is noted in Dr. Roy's list for Braeriach and Cairn Toul, and by Mr. Druce for Loch Mallachie, on Speyside. *U. vulgaris*, L., has been found in Loch Callater. Both these species and *U. minor*, L., should be looked for in suitable situations upon the Cairngorms.

Pinguicula vulgaris, L. Common Butterwort. Is one of our most common "fly-catchers", growing in moist places from the coast up to nearly 3000 feet elevation.

Thymus Serpyllum, L. Wild Thyme; and } In dry pastures up to 2000 feet.
Prunella vulgaris, L. Self-heal.

Littorella juncea, Bergius (*L. lacustris*, L.). Plantain Shoreweed. Grows along the margins of pools and lochs, either under water or on the moist shores. In both situations it frequently forms so close a vegetation as to resemble a grassy sward. It occurs, somewhat locally, from the sea level up to 1650 feet elevation.

Polygonum viviparum, L. Viviparous Alpine Bistort. In natural pastures almost from the sea level to over 2500 feet: widely distributed. Many of the flowers are replaced by reproductive bulbils usually.

Oxyria digyna, Hill. Mountain Sorrel. Abundant on moist rocks in many places up nearly to 4000 feet elevation. It occurs on shingle along the Dee nearly to Aberdeen.

Rumex. The true Docks do not reach any great elevation, indeed they can scarcely be ranked as Cairngorm plants; but they are mentioned here to ask for notes of the elevations reached by them. The species are hard to distinguish. Specimens should show ripe fruit and one or two lower leaves.

R. Acetosa, L.—Common Sorrel—and *R. Acetosella*, L.—Sheep's Sorrel. In pastures up to high altitudes. Accurate observations of the limits attained by each are desirable.

Mercurialis perennis, L. Dog Mercury. Grows from the coast to over

1700 feet above the sea, usually under the shade of trees, but sometimes on broken slopes.

(*Urtica dioica*, L. Common Nettle. I have no mention of the occurrence of this plant on the Cairngorms; but include it to ask that, if met with, a note be made of whether it appears to be native, or might probably have been introduced by man or by sheep. Wherever I have seen it among the hills, its occurrence has been reconcileable with its introduction by man, directly or indirectly.)

Myrica Gale, L. Bog Myrtle. Grows on marshy heaths and in bogs from the coast up to considerable altitudes, e.g., in Glen Avon, often abundantly. Its upper limit should be noted.

Betula alba, L. Common Birch. Nearly up to 2000 feet, but small and bush-like towards its limits. (Both *B. glutinosa*, Fr., and *B. verrucosa*, Ehrh., are found in the district.)

B. nana, L. Dwarf Birch. Local, between 1600 and 2100 feet, on Beinn a' Bhuidr, on both the Craigandals, and in Glen Avon. It is noted by Dr. Roy in his list for Braeriach and Cairn Toul. Where it grows near the common birch intermediate forms should be looked for.

(*B. intermedia*, Thomas. Has been found in Glen Callater.) Professor Babington suspects that a *Betula*, found by himself "on Ben Avon, Braemar, in 1842", in barren condition, may be *B. humilis*, Schrk.

Salix. Willows and Sallows. This genus, like *Hieracium*, contains many forms that task the skill of trained botanists to distinguish them. Several of the species are among the more characteristic of our Alpine plants, and these alone will be referred to at present.

S. nigricans, Smith—Dark-leaved Willow—and *S. phylicifolia*, L.—Tea-leaved Willow. May be looked for along streams—the former up to nearly 3000 and the latter to over 2000 feet.

S. lapponum, L. Downy Mountain Willow. On moist, broken cliffs, at from 2000 to 3500 feet, on most of the Cairngorms.

S. Myrsinites, L. Small Tree Willow. On Little Craigandal, and in Dr. Roy's list for Braeriach and Cairn Toul. It is recorded by Mr. Druce as not uncommon on the south side of Glen Eunach.

S. herbacea, L. Least Willow. On broken ledges and gravelly slopes from 2000 feet to the tops of the mountains, reaching the summit of Ben Muich Dhui. Its leaves are often loaded with the berry-like galls of a sawfly. (Other Alpine willows, viz., *S. lanata*, L., Woolly Broad-leaved Willow, and *S. reticulata*, L., Reticulated Willow, are found in Glen Callater, though not yet on record from the Cairngorms. They should be looked for on the latter mountains.)

Populus tremula, L. Aspen. Up to 1600 feet.

Empetrum nigrum, L. Crowberry. A common plant on most heaths, and also in natural pastures from the coast to over 4000 feet elevation.

Quercus Robur, L., Oak, and *Corylus Avellana*, L., Hazel. Occur in the glens up to about 1500 feet elevation. I have no sufficient notes to determine the respective altitudes in the Cairngorms reached by the two forms included under *Q. Robur*.

The Orchids are poorly represented in the mountain flora. *Malaxis paludosa*, Sw., Bog Orchis, has been found in a bog near Linn of Dee, and near Boat of Garten. *Orchis maculata*, L., the Spotted Orchis, is common on dry heaths, ranging from the coast to 3000 feet of altitude. *Listera cordata*, R. Br., Heart-leaved Tway Blade, grows among tall heather up to 1700 feet. *Habenaria Conopsea*, Benth., and *H. albida*, R. Br., occur in short natural pastures up to nearly 2000 feet, *e.g.*, at the base of Ben Muich Dhui; and *H. viridis*, R. Br., Frog Orchis, in similar pastures and on rocky ledges up to 3300 feet. The last three orchids are easily overlooked owing to their small size and inconspicuous habit.

Narthecium ossifragum, Huds. Bog Asphodel. Adorns the wet moors and bogs with its spikes of yellow flowers up to 3200 feet.

Tofieldia palustris, Huds. Scottish Asphodel. Local, and confined to marshy spots, from about 1500 to 2600 feet. It has been found on all the Cairngorms. It is so inconspicuous as to be easily overlooked.

Juncus. The true Rushes are abundant in most marshy localities, alike on moors and by streams, as well as on the ledges of wet rocks.

J. effusus, L., and *J. conglomeratus*, L. Occur up to about 2000 feet; *J. lampocarpus*, Ehrh., *J. supinus*, Moench., and *J. squarrosus*, L., to 2500 feet, but all of these species are plentiful in the lowlands also.

Juncus alpinus, Villars. Discovered as a British plant by Dr. F. B. White in Perthshire in 1887; has since been recorded by Mr. G. C. Druce from Glen Eunach. It might readily be passed as a form of *J. lampocarpus*. Despite its name, it does not appear to be a peculiarly Alpine plant.

J. trifidus, L. Trifid Rush. Is a characteristically Alpine plant, growing freely in gravelly places from 2000 feet up to the summits of the highest mountains.

J. triglumis, L. Three-flowered Rush. This small species is local, though not scarce in various localities, especially on moist rocks, from about 2000 to 2500 feet.

Luzula. The Wood Rushes are usually found in drier pastures, occurring frequently on the mountains. *L. maxima*, D.C., reaches 2500 feet, and *L. campestris*, D.C., and *L. multiflora*, Lej., rise to about 3000 feet altitude; but all range from the coast upwards.

L. arcuata, Wahl.—Curved Mountain Wood-rush—and *L. spicata*, D.C.—Spiked Mountain Wood-rush—are peculiarly Alpine plants, the former scarce passing below 3700 feet of elevation, and the latter seldom below 2000 feet, while both extend to the summit of even Ben Muich Dhui. *L. arcuata* is by far the more local of the two, but is much more abundant on the Cairngorm mountains than elsewhere in Scotland, though rather scarce on Ben Avon and on Beinn a' Bhuid.

Sparganium affine, Schnizl. Floating Bur-reed. Grows in boggy pools at the foot of Ben Muich Dhui, and on Speyside.

S. minimum, Fr., is recorded by Mr. Druce from Loch Mallachie on Speyside.

Potamogeton. Pondweeds. The water-weeds of this genus should be looked for in the lochs and pools of the Cairngorms. *P. polygonifolius*, Pour., grows in the small pools on swampy moors up to nearly 2000 feet.

Scirpus caespitosus, L. "Deer's Hair Grass". Forms a very conspicuous share in the vegetation of peaty heaths, to which its russet-coloured stems and leaves often give the appearance from which it derives its popular name. It ranges from the coast to 3500 feet of elevation.

Eriophorum vaginatum, L.—Hare Tail Cotton Grass—and *E. angustifolium*, Roth—Narrow-leaved Cotton Grass—are very conspicuous on most damp moors during summer, when their cottony fruiting heads are fully formed. *E. vaginatum* is the more local, but extends from 100 to 2500 feet above the sea. *E. angustifolium* ranges from the coast to 3500 feet.

Rhynchospora alba, Vahl. White Beak-rush. Has been recorded from the base of Beinn a' Bhuird and Ben Avon by Mr. R. Mackay. I have not seen examples from the Cairngorms.

Carex. Sedges. These form a very considerable part of our Alpine flora, the species being numerous, though their slender grass-like habit renders them inconspicuous. Several species extend upwards from the lowlands to high elevations on the mountains. Among these are:—*C. dioica*, L., to 2500 feet; *C. pulicaris*, L., to 2000 feet; *C. echinata*, Murray, to about 2500 feet; *C. curta*, Good., to 3500 feet; *C. Goodenowii*, J. Gay, to over 2000 feet; *C. flacca*, Schreb., to about 2000 feet; *C. limosa*, L., on marshy ground near Loch Mallachie; *C. pallescens*, L., to nearly 2000 feet; *C. panicea*, L., to nearly 4000 feet; *C. flava*, L., to 2000 feet; *C. filiformis*, L., rare, beside Lochs Mallachie and Gahmna; *C. vesicaria*, L., near Doune, Speyside; and *C. rostrata*, Stokes, to 3000 feet—all in marshy places; and *C. pilulifera*, L., and *C. binervis*, Smith, to over 3000 feet on drier moors.

Other species, of greater interest to us at present, are quite Alpine in their distribution, or nearly so. These are as follows:—*C. pauciflora*, Lightf., on moors from about 800 to 2000 feet above the sea; var. *alpicola*, Wahl., of *C. curta* occurs on the higher mountains; *C. lagopina*, Wahl., is very local, but occurs on dripping rocks on Cairn Toul, and it is included in Dr. Roy's list of Ben Muich Dhui and Cairngorm plants, and is recorded by Mr. Druce as "abundant over a limited range in one of the Cairngorm corries"—it grows at about 3500 feet of elevation. *C. atrata*, L., not plentiful, but widespread among the Cairngorms, from 2400 feet upwards; *C. rigida*, Good., in Alpine pastures up to the mountain summits; *C. aquatilis*, Wahl., in swampy bogs up to nearly 3000 feet; *C. rariflora*, Smith, rare on Cairngorm, in marsh, at a high elevation; *C. vaginata*, Tausch, in marshes and on moist ledges at 2500 to 3500 feet on all the Cairngorms—it much resembles *C. panicea*; *C. capillaris*, L., from wet ledges at 1800 to

2500 feet on Little Craigandal ; it is also in Dr. Roy's list of Braeriach and Cairn Toul plants..

The true grasses that form a part of the Cairngorm flora comprise a considerable number that extend upwards from the lowlands, even from the sea level. Along with these are truly Alpine species, confined within a limited range on the upper portions of the mountains.

Among the widely-distributed grasses that are sufficiently abundant in the mountain flora to be worth naming here are the following species :—*Anthoxanthum odoratum*, L., Vernal Grass ; *Agrostis vulgaris*, With., Fine Bent Grass (with a dwarf form known as *pumila*, the fruits in which are replaced by small masses of the dark spores of a fungus) ; *Deschampsia caespitosa*, Beauv., Tufted Hair Grass, often as the variety *brevifolia* (Parnell), and not seldom with the inflorescence bearing leafy buds instead of flowers or fruits ; *D. flexuosa*, Trin., Waved Hair Grass, the form *montana* (Huds.), occurring at the higher altitudes ; *D. discolor*, R. and S. (*Aira uliginosa*, Weihe), on the borders of lochs, from about 200 to over 1000 feet above the sea level ; *Sieglingia decumbens*, Bernh., Heath Grass ; *Molinia coerulea*, Moench, Purple Molinia, varying much in size, branching, and colour ; *Melica nutans*, L., Mountain Melic Grass, below 2000 feet ; *Briza media*, L., Quaking Grass, on the lower moors ; *Poa pratensis*, L., Smooth-stalked Meadow Grass, especially as the dwarf form *subcaerulea* (Smith) ; *P. nemoralis*, L., var. *Parnellii*, (Bab.), local, to 1400 feet ; *Glyceria fluitans*, B.Br., Floating Meadow Grass, in still pools of the streams ; *Festuca ovina*, L., Sheep's Fescue Grass, to the highest summits, and very often with a dense mass of leafy buds replacing the flowers, especially at the higher altitudes. Several of the above reach or pass 3500 feet above the sea ; but they cannot be fairly called Alpine plants, being equally common in the lowlands, except in the varietal forms named.

The truly Alpine grasses in the flora of the Cairngorms are few and not conspicuous. They require to be looked for in their chosen habitats—on ledges of wet rocks or along the small valleys of the rivulets. They are :—*Alopecurus alpinus*, Smith, Alpine Fox-tail, at from 2400 to 3500 feet, recorded from Braeriach, Ben Muich Dhui, and head of Glen Avon ; *Phleum alpinum*, L., Alpine Cat's-tail, in marshy places, from 2400 to 3500 feet, on all the Cairngorms ; *Deschampsia alpina*, R. and S., Smooth Alpine Hair Grass, on moist rocks at 3000 to 4100 feet, and *Poa alpina*, L., Alpine Meadow Grass, at from 2400 to nearly 4000 feet, on all the Cairngorms, often viviparous, or with leaf buds replacing flowers.

Juniperus communis, L., Common Juniper, is frequent up to over 2000 feet ; *J. nana* (Willd.), Dwarf Juniper, at Pools of Dee, also near Loch Avon and on Cairngorm.

Pinus sylvestris, L. Scotch Fir. This tree may reach an elevation of over 2000 feet in specially favourable situations ; but it seldom occurs above 1500 feet.

A considerable number of Ferns extend their range from the lowlands well up on the mountains; but certain others are Alpine in their distribution, not, or scarcely, passing into the lowlands. *Pteris aquilina*, L., Bracken, is peculiarly interesting, as it ceases in this part of Scotland at from 1600 to 1900 feet above the sea, practically the limit of cultivation. It has been taken by Mr. H. C. Watson as marking the limits of the Upper Agrarian zone. The more interesting of the ferns of the Cairngorms, from 2000 feet above the sea upwards, are as follows:—*Cryptogramme crispa*, R. Br., Parsley Fern, local on stony slopes, on Cairn Toul up to 3900 feet, and Beinn a' Bhuid and near Loch Avon; *Asplenium viride*, Huds., Green Lanceolate Spleenwort—from 1100 to 2500 feet, in Dr. Roy's list for Braeriach and Cairn Toul; *Athyrium alpestre*, Milde, Alpine Polypody, on all the Cairngorms, on stony slopes and in fissures of rocks from 2200 feet upwards; *A. flexile*, Syme, a rare and local Alpine species, has been gathered by Mr. G. C. Druce "on the Cairngorms, the precise locality, for obvious reasons", being withheld, but he notes it elsewhere as towards the head of Glen Avon; *Polystichum Lonchitis*, Roth, Holly Fern, among stones and in crevices of rocks on Cairn Toul and Cairngorm and in Glen Eunach; *Lastrea Oreopteris*, Presl., Heath Shield Fern, frequently abundant up to over 2000 feet; *Phegopteris Dryopteris*, Fée, Oak Fern, and *P. polypodioides*, Fée, Beech Fern, from the coast upwards to Ben Muich Dhui, on waste banks, among stones, &c.

Lycopodium. All the Club-mosses met with in this district of Scotland ascend far up on the mountains.

Lycopodium Selago, L. Fir Club-moss. On moist heaths from almost the sea level to the summits of the highest mountains.

L. annotinum, L. Interrupted Club-moss. From 1000 to 2600 feet, on heaths on all the Cairngorms.

L. clavatum, L. Common Club-moss. Is frequent in many places on heaths up to 2000 feet.

L. alpinum, L. Savine-leaved Club-moss. From 200 to 3500 feet, on heaths and mountain pastures, often very abundant.

Selaginella selaginoides, Gray. Less Alpine Club-moss. On most swampy heaths from the sea level to over 3000 feet.

Isoetes lacustris, L. European Quill-wort. Is included in Dr. Roy's list for Braeriach and Cairn Toul. It, and other species of *Isoetes*, should be looked for in the lochs among the Cairngorms.

Equisetum. Horsetails. Of this genus little need be said with regard to the Cairngorm flora, though *E. sylvaticum*, L., *E. limosum*, L., and *E. palustre*, L., extend to over 2000 feet, and *E. pratense*, Ehrh., is found on Little Craigandal.