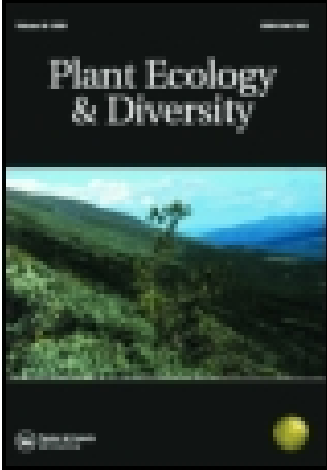


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Club, to consist of naturalists who are in the habit of visiting alpine districts of Scotland for the practical study of science, and who have proved themselves to be pleasant *compagnons de voyage*. No one is to be admitted who has not these qualities, and who has not proved that he has ascended on foot to the summits of three Scottish mountains, not less than 3300 feet above the level of the sea. Ten original members were named and elected.

On the 11th of August the botanical party broke up, some departing early in the morning, and the others in the forenoon for their respective destinations.

II. *On New and Rare Mosses from Ben Lawers, Perthshire.*

By J. STIRTON, M.D.

(Continued from Vol. X. p. 432.)

Since the reception by this Society of the former part of this paper, I paid in June of this year another visit to Ben Lawers; and although I directed my attention mainly to the investigation of its lichen flora, I succeeded in adding several species to the list of rare mosses already detected there.

Zygodon Stirtoni (Schp.) at the base of the mountain, near the hotel, in fruit. This moss, first detected in 1865 on Ben Lomond, in a barren condition, was submitted to Professor Schimper of Strasbourg, who pronounced it new. The denser areolation, strongly excurrent nerve, and more rigid condition of the leaves in a moist state, are the principal distinguishing characters, while the capsule, in its more rounded outline, supplies another, all of which warrant its separation from *Zygodon viridissimus*.

In the same packet of mosses sent to Dr Schimper for discrimination, was inserted another *Zygodon*, picked from a stone wall near Bowling during the same summer, concerning which he wrote, "Impossible de deviner ce qu'il pourrait être." In this the areolation of the leaf is still denser than that of the other, the nerve as strongly excurrent, while the shape of the leaf approaches closely to that of *Zygodon conoideus*. I am persuaded that much more

maybe done amongst the *Zygodontes* of this country, judging from their prevalence and luxuriance towards the west coast.

Dissodon splachnoides occurs in great profusion in three places on the mountain. One, near the source of the stream, on the banks of which grows *Bryum cirrhatum*; a second, on the margins of another, which, taking its rise in a corrie of Craig-na-Gour, facing Schiehallion, receives in its course the waters of the many rivulets that trickle down the northern shoulder of Ben Lawers; and a third, in a marshy spot, considerably up the mountain on its southern aspect, directly facing the hotel. I am delighted at being able to communicate this, as there is every likelihood of a never-failing supply of this rare and beautiful moss—unless, indeed, botanists, on alighting upon it, manifest a spirit of extermination.

Splachnum vasculosum still holds a precarious existence in one spot at the head of the ravine already so frequently alluded to, and I have viewed with alarm at each succeeding visit its narrowing area and feebler, more straggling growth. It is evident, in all the localities I have visited, that this moss will not bear to be disturbed, a fact which first impressed itself on my attention on the occasion of a second visit to a station for it on another mountain, where it was nearly extinct, although I left more than half of the capsules at my previous visit.

Bryum Ludwigii, in huge masses on the eastern shoulder of the mountain, skirting the direct ascent to Loch-na-Gat from the hotel, in spots bare of other vegetation, and liable to be periodically flooded. I have also found this moss on almost every mountain towards the west coast, having an elevation of 3000 feet.

Bryum Duvallii, above and to the north-west of Loch-na-Gat, near the sources of a small stream, one of the tributaries of the main one that empties itself into the loch; also sparingly at the head of the western ravine. This moss I have also secured from Ben More and Ben Ledi.

Bryum demissum, scattered in small detached compact tufts at the head of same ravine, and more sparingly downwards.

Mnium spinosum, barren, over a pretty wide area through-

out this ravine, generally beneath detached rocks; also in same situations above Loch-na-Gat. First detected by Mr M'Kinlay in 1865.

Mnium cinclidioides, very abundant in a marshy spot facing the hotel, and just below the corresponding station for *Polytrichum sexangulare*. Detected in company of Dr Fraser of Wolverhampton in July 1869.

Cinclidium stygium, detected in June of this year in marshy spots, half-way up the large corrie between the summit of the mountain and Loch-na-Gat, sparingly, although in fine condition, but barren. Found also in great luxuriance near the summit of Ben Ledi, and again in July 1867 fruiting freely.

Catocopium nigrum, on wet grassy slopes near the base, westward of the hotel, in considerable abundance, and fruiting freely, in June of this year. This moss has long been a desideratum, for although comparatively not rare, yet from the nature of the soil and relative situation of the mountain it might fairly have been anticipated.

Atrichum tenellum, said to have been found by Messrs Wilson and M'Kinlay, on Craig-na-Gour, a neighbouring mountain, and forming, indeed, part of it. In my possession are specimens from the latter gentleman under this name, which, however, undoubtedly belong to *Atrichum undulatum*, as the inflorescence, successfully detected in one instance, is monoicous. Further I cannot go, for although I devoted several hours on one occasion to a search for the moss in the same habitat, in every instance almost I satisfied myself that the specimens belonged to *A. undulatum*, although the capsules were shorter, and altogether the plant presented considerable resemblance to continental specimens of *A. tenellum*.

Myurella apiculata, very sparingly in western ravine, associated in every instance with *Myurella julacea*, in July 1866. Detected the previous year, for the first time in Britain, on Craig Chailleach by Mr M'Kinlay.

Leskea nervosa, in small detached tufts, on the under surface of rocks, sparingly throughout the western ravine, in July 1866 and subsequently. The specimens agree well with those from the Jura.

Anomodon longifolius. On almost every occasion of a

visit to the mountain, I have devoted a portion of my time to a search for this moss, but hitherto without success. Even *Anomodon viticulosus*, with which it is associated in the Den of Airlie, was found in only two localities, very sparingly, but without traces of the other. Dr Greville's specimens are said by Mr Wilson to contain pieces of the bark of some fir and trees of this description. I have searched in vain in almost every locality where they grow. The want of success is to be deplored, all the more that the death of Dr Greville precludes the possibility of arriving at any more definite information of the particular place of growth.

Hypnum catenulatum, on rocks above Loch-na-Gat, as well as in corresponding situations in the western ravine, sparingly, and likely to become extinct.

H. atrovirens, common throughout the same ravine, fruiting freely.

Hypnum dimorphum, in considerable abundance in similar situations, and presenting remarkable varieties, from the straggling form, resembling *H. heteropterum*, to the compact robust state similar to that from the Pyrenees.

Hypnum delicatulum, very sparingly in the Ordnance Ravine, barren.

Habrodon Notarisii, I record here, from the fact of having secured two or three small tufts from an old ash tree at the foot of the mountain, although, as is well known, Killin must be held as the centre of spread of the plant.

Pterogonium filiforme, in considerable abundance on all the southern aspect of the mountain, and presenting every shade of variety, from the so-called *Hypnum cylindricum* of Dickson to *P. helveticum* of Hooker.

Cylindrothecium Montagnei, in considerable patches near Loch-na-Gat, and at the head of the western ravine, where in one spot it grows to the exclusion of every other form of vegetation over an area of several square yards. Detected also in the grounds of Finlarig, near Killin.

Brachythecium cirrhosum is still attainable in several spots, but those where it grows in greatest luxuriance are almost inaccessible, although the eye at a distance of twenty feet can still detect the huge tufts, owing to their characteristic colour.

Hypnum plicatum, throughout the western ravine, beneath detached rocks. Of all the rarities this is the most abundant and likely to hold its place.

Hypnum glareosum obtrudes itself in many places on the grassy declivities of the western ravine. The tufts are compact and stems upright, not procumbent, as is usually the case.

Hypnum reflexum, on the ground beneath rocks principally, more rarely on the rocks themselves, generally on the upper third of the mountain, and fruiting freely during some seasons.

Such an extraordinary series of gradations in size occurs in the various localities where the moss is found, more especially in the western ravine, that I am tempted to enter somewhat into detail concerning them. Struck with the various appearances assumed, I submitted some years ago specimens of the larger forms to Dr Schimper, especially those in which the nerve extends only half-way up the pagina. After due investigation and comparison, as stated by himself, he could not identify them with *H. reflexum*, and accordingly raised the one with the abbreviated nerve to the rank of a species, under the name of *Brachythecium (Hypnum) Huntii*. Next year a more rigorous investigation revealed another form, where the leaves were distinctly striated towards the base, as in those of *H. Starkii*, and otherwise showing characters that clearly pointed to a close affinity, if not identity, with this moss. Thus far the matter remained in abeyance for another year. During my next visit I alighted upon a tuft, circular in outline, and about fifteen inches in diameter, on the extreme verge of which were genuine specimens of *H. reflexum*, although smaller than usual. Bordering with these, but nearer the centre, were larger forms, with the nerve still reaching the apex; while still nearer the centre I detected the so-called *H. Huntii*. More extraordinary still, at the centre were discovered two forms, one of which corresponded in almost every particular with continental specimens of *H. Starkii*; the other, at first blush, presented the appearance of *H. plicatum*, inasmuch as the leaves were deeply sulcated; and their size, shape, and even texture, in no essential point differed from the corresponding characters in the latter, but the

stems were entirely destitute of tomentum, so characteristic of this moss. Mr Wilson, to whom specimens were sent, declared at first in favour of association with *H. glareosum*, which, as has been already stated, grows in the neighbourhood of the station, but afterwards decided in favour of *H. plicatum*; but the invariable absence of tomentum presents a serious obstacle to their union, more especially as in every specimen of *H. plicatum* from the same mountain its presence is manifest.

Now, with reference to all these types or forms (call them what you will), one or other of two conclusions is inevitable,—either they are specifically distinct, or merely varieties of one and the same moss, viz., *H. reflexum*; in other words, we are here again brought face to face with the question of the fixity of species. Without reopening this much vexed question, permit me to say, that I have serious scruples (to make use of no more definite expression) in blending together all these forms. The gap between the first and last is a wide one. Not to speak of size, which is dependent on so many contingencies, the structural differences (if any account is to be taken of them at all) are so manifest and obvious, that I cannot forbear concluding that there are at least three species in the tuft, viz., *H. reflexum*, *H. Starkii*, and the one with the deeply sulcated leaves, which I shall provisionally name *H. intermixtum*.

Hypnum pulchellum (Hedwig), in one spot on Craig-na-Gour, looking towards Schiehallion. This is not the *H. pulchellum* described by Wilson in the “Bry. Brit.,” and which ought to be named *H. nitidulum*, but a much rarer plant, and the station for which, given above, is the only one I have alighted on.

Hypnum Mühlenbeckii occurs in many places, and fruits more freely than on any other mountain I have climbed.

Hypnum annotinum (MSS.) is found sparingly throughout the western ravines, likewise above Loch-na-Gat. It is allied to *H. denticulatum*, but distinct in the curiously interrupted manner of growth of the branches; in the margins of the leaf reflexed almost to apex, resembling, in this respect, *H. crassinervium*; larger areolation, and, lastly, in the capsule, which is striated when dry.

Hypnum Halleri, in two of the ravines running parallel to the Ordnance-ravine, is on the eve of extinction; as in the three localities where I have seen it, the specimens are stunted, and show besides the debris of others that have lost their hold.

Hypnum rugosum, very sparingly near the lower exit of the Ordnance ravine.

Hypnum Breadalbanense (White) is found plentifully in the western ravine, as well as generally throughout the rocky places near the summit. This moss has been known to me since 1862, when (in September) I sent specimens to Mr Wilson, who pronounced it a variety of *H. commutatum*,—a decision with which I am still inclined to agree, although Dr Schimper, to whom Dr B. White communicated it, asserted that it was unknown to him. The other *Hypnum* from the same mountain, exhibited before this Society by Dr B. White, I have not seen, nor can I at present recall its name.

H. callichroum, common throughout the western ravine, while *H. hamulosum* var. *micranthum*, much the rarer of the two, as it turns out, in this country, is found on Craigna-Gour and Craigna-Lochan.

Hypnum imponens, in one spot in the western ravine. The specimens differ in no respect from genuine examples from the Continent, except in the more robust growth, and a deeper tinge of green in a living state, which, however, merges into the characteristic orange yellow in the act of drying, or by keeping for a length of time in the herbarium.

Hypnum arcticum, in two spots near the sources of the main stream that pours into Loch-na-Gat from the mountain.

H. trifarium, in extended masses on the northern aspect of the rocks that enclose Loch-na-Gat on the north-west.

Hypnum Oakesii, plentiful in various localities, as in the western ravine, and above Loch-na-Gat.

Hypnum umbratum, much more sparingly in similar localities to the above.

H. Bambergeri was detected, in July 1869, in one of the parallel ravines already described, although Dr Fraser of

Wolverhampton was the first to detect it on the mountain. A very characteristic moss when examined closely, although at first sight it might be overlooked as a form of *H. cupressiforme* or *H. callichroum*.

Andreaea falcata is met with sparingly in several spots. It is another remarkable circumstance, that the *Andreaeæ* are not well represented on the mountain; probably the friable nature of the rocks for the most part, is the main reason why this tribe cannot secure a sufficient hold. On the schistose rocks the species are almost entirely absent, and it is only when the trap presents that any tufts have maintained a place.

With this closes the record of rare mosses found on Ben Lawers, so far at least as I know, or have discovered them. The list might have been considerably extended; but I have abstained from including many which, although comparatively rare, are common enough on our Highland mountains,—as *Ædipodium Griffithianum*, which I have secured on almost all our western mountains, of any considerable elevation, and nowhere in greater profusion than on Ben Ina, at the head of Loch Long, where, on one occasion, I secured hundreds of capsules within an area of a few feet.

Considering the limited extent of the ground, there is no mountain in Great Britain that can at all be compared with Ben Lawers in the richness and variety of its flora. The labours of Admiral Jones, Carrol, Crombie, and others in the section of lichens, show a corresponding richness; and much as they have done, patiently and perseveringly, the field in this respect is not yet exhausted, as I may soon have occasion to show.

III. *On the Variation, at different Seasons, of a Hieracium, considered to be H. stoloniflorum, Waldst. and Kit., as described in Fries' "Symbolæ ad Historiam Hieraciorum," Upsala, 1848, p. 5. By Professor BALFOUR. (Plates II. III.)*

The author remarked that this plant, which grows abundantly on the banks of the Granton railway, and which had been described by him last year in the Transactions, vol. x.