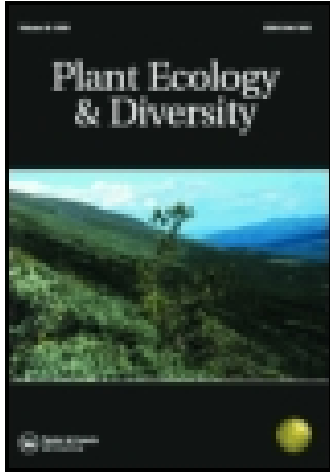


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The Mosses And Hepatics Of Prince Charles Foreland, Spitsbergen

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On Friday, 2nd August, the members drove about five miles up the Lochay Valley, and walked home, botanising on the way. *Orchis maculata* was found in great abundance all along the side of the road, many plants with pure white flowers being seen. *Gymnadenia conopsea*, *Habenaria chlorantha* were also found in fair quantity, as well as *Campanula latifolia*, *Epilobium angustifolium* and *Trollius europæus*. Some rain fell late in the afternoon of this day, but not until the members had almost reached the hotel, so that they had the pleasant experience of four consecutive days' botanising without once getting wet.

On the whole a very successful meeting was spent; nearly all the well-known rare alpine plants growing in this district being found, the finding of *Carex ustulata* on Beinn Haesgarnich, though not on Beinn Lawers as well, more than compensating for other disappointments. The members returned home on the morning of Saturday 3rd of August.

Before sitting down, I would like to refer for a moment to the Report, read a year ago, of the Club's visit to Connemara in 1906. As some of you may recollect, the principal object of holding the meeting in that district was the re-discovery, if possible, of *Erica Stuarti*, originally found there by the late Dr. Stuart during a previous meeting of the Club many years before, but the members had to leave without, as they thought, having obtained a plant.

It is most interesting to be able to record, however, that a plant gathered by one of the members as *Erica Mackayana* has proved on cultivation to be true *Erica Stuarti*, it having flowered last summer. I may add that none of the plants of *Erica Mackayana* were in flower—they could only be distinguished by their foliage.

THE MOSSES AND HEPATICS OF PRINCE CHARLES FORELAND, SPITSBERGEN. By Dr. J. HAGEN, Trondhjem. Communicated by the Secretary.

The collections described in this paper were made by Dr. W. S. Bruce, during his exploration of Prince Charles Foreland, the most westerly island of the Spitsbergen Archipelago, in the summers of 1906 and 1907. The material

entrusted to me consisted of eighteen envelopes containing unprepared mosses and liverworts, fourteen of them gathered on the 4th and 23rd to 27th August 1906, and four of them in 1907. Though the collection is rather a small one, it presents nevertheless some features of interest particularly in regard to the habit of the plants, some of them being stunted and woven together into compact, almost woody tufts, as for instance *Dicranum elongatum* and *Jungermannia minuta*. Others appear even at this high latitude in loose cushions growing in a luxuriance not surpassed by plants from much more southern regions, and this is the case even in species by no means characteristic of the Arctic zone, as for instance *Oncophorus Wahlenbergii* and *Aulacomnium palustre*. It is well known that this difference in growth depends not only upon the nature of the species but to a far greater extent upon external influences: an exposed, dry, or weather-beaten situation favours the formation of hard tufts, while a sheltered position allows the plants to develop freely.

High latitudes also give their impress to the vegetation in another way: almost all the mosses and hepatics are found in a barren state. The short summer and the low temperatures are not favourable to the maturation of sexual organs, and in the present collection only *Oncophorus Wahlenbergii* is found with fruits; even this species is only in the first stage of fructification, and it is doubtful if it reaches maturity. In the same way, only one hepatic, *Jungermannia minuta*, has developed perianths. *Hypnum revolutum* has male flowers and *Hypnum uncinatum* both male and female but no sign of fructification, a condition which is also met with in the higher mountains of Norway. Another effect of the severe conditions is seen in the tufts of mosses rarely being pure but generally containing a mixture of a number of species. In some cases this intimate mingling of species is very remarkable to one who only knows them from their habits in more southern latitudes and in more favourable circumstances.

The collection contains nineteen species of mosses and four of hepatics. Among the mosses one new variety occurs, *Hypnum uncinatum*, Hedw., var. *fæneum*, while *Dicranum spadiceum* is a new record for Spitsbergen.

MOSESSE.

Oncophorus Wahlenbergii, Brid., var. *Homanni*, Boeck.—A cushion 4 to 4·5 cm. in height, with leaves more than 4 mm. long and with some young fruit stalks.

Dicranum molle, Wils.—Growing in cushions, sometimes intermingled with the preceding.

Dicranum spadiceum, Zett.—Shoots occur in cushions of *D. elongatum*. As far as I know, this species has not been previously recorded from Spitsbergen, though it is known from other parts of the Arctic regions and also from Finmark, Siberia and East Greenland.

Dicranum elongatum, Schleich.—Common: in some cases forming the bulk of tufts, in other cases mixed with various species.

Dicranum grœnlandicum, Brid.—A small tuft from "Talus at foot of 1050 ft. hill" at the southern end of the central range.

Ditrichum flexicaule (Schleich.), Hampe.—In a tuft together with *Dicranum spadiceum* and *D. elongatum* evidently growing on earthy soil.

Rhacomitrium lanuginosum (Ehrh.).—Growing sparingly in a tuft of several species from Cape Cold.

Webera commutata, Schimp.—A few shoots among *Dicranum grœnlandicum*.

Bryum crispulum, Hampe.—Occurring in cushions of *Hypnum uncinatum*.

Mnium affine, Bland., var. *integrifolium*, Wils.—Only a few shoots among other mosses near Vogel Hook.

Cinclidium subrotundum, Lindb.—Growing sparingly in tufts of *Oncophorus Wahlenbergii*.

Aulacomnium palustre (L.), Schwägr.—Luxuriant specimens up to 9 cm. in height. Cape Cold and north-west coast.

Var. *polycephalum* (Brid.), Bry. Eur. A tall, loosely cohering tuft from Cape Cold.

Tinnia austriaca, Hedw.—Some shoots among *Dicranum elongatum* from Cape Cold.

Polytrichum alpinum (L.), var. *brevifolium* (R. Br.), Brid.—Occurs sparingly among *Dicranum spadiceum* and *D. elongatum*.

Brachythecium udum, Hag.—An Arctic species previously known from various localities in the higher mountains of Norway. On Prince Charles Foreland it occurs in a smaller form markedly decumbent, in very loose tufts, or creeping in single individuals among grasses and other higher plants in moist sheltered places. Near Vogel Hook.

Hypnum uncinatum, Hedw.—Occurs in cushions, singly, or mixed with other mosses. Two forms are found, one of which corresponds to var. *abbreviatum*, Bry. Eur. The other is hitherto undescribed, though known from the shores of northern Norway, where it is abundant, but has previously been confounded with var. *orthothecioides* (Lindb.).

Var. *feneum*, n. var. In *cæspitibus luteis, lavis, decumbentibus, raro suberectis vigenis, longa, longissima, simplex; folia valde hamata, longe cuspidata; fructus rari*. It is easily distinguished from var. *orthothecioides* by the long falcate secund leaves. North-west coast near Vogel Hook.

Hypnum revolutum, Mitt.—Male plants in a mixed tuft from Vogel Hook.

Hypnum stramineum, Dicks.—A large tuft of only this species, and another in which other species also occur. Almost the typical form. Vicinity of Vogel Hook.

Hypnum sarmentosum, Wahlenb.—Found in tufts with other species and also by itself. A single cushion, containing only this species, is hardly more than 2 cm. high, and is glossy with yellow and brown colouring. It contains plants varying in size, some of them approaching the type of the species, but the majority of them short, broad, and with less leaves, almost agreeing with var. *arcticum* (C. Jens.), from which they differ however in the leaves of the branches being sharply pointed. But great importance cannot be attached to this difference since specimens from Red Bay, gathered by Malmgren, in other characters agreeing with the Foreland plants, show on one and the same branch both obtuse and pointed leaves. The Foreland specimens may therefore be referred to the above variety, which it may be more correct to name var. *pumilum*, Milde (Bryol. Siles., p. 369), since this seems, from the description, to be the same as var. *arcticum*.

HEPATICÆ.

Jungermannia quinquedentata, Huds.—Some shoots intermingled with *Dicranum grœnlandicum*.

Jungermannia Flœrkei, Web. et Mohr.—Occurs sparingly in a tuft of the following species.

Jungermannia minuta, Crantz.—Common: in compact hard tufts, with a profusion of perianths.

Blepharostoma trichophyllum (L.), Dum.—Occurs sparingly in company with the last species.

ON THE PROTHALLUS OF LEPIDODENDRON VELTHEIMIANUM.
By WM. T. GORDON, M.A., B.Sc. (*Carnegie Research Scholar in Geology, Edinburgh University*). Communicated by the Secretary. (Plate VII.)

In the Carboniferous Epoch the lycopod alliance formed one of the dominant groups of plants, and contained not merely small forms with a habit similar to the modern representatives of the group, but also large arborescent forms. With such great differences in the vegetative parts we should expect corresponding differences in the reproductive strobili which these plants produced. In *Lepidocarpon*, *Miadesmia* and *Spencerites* we see such specialisation in a marked degree, the seed-like form of the first two showing adaptation to drier conditions than lycopods now grow in. Others show a closer approach to *Selaginella* in the organisation of their strobili, though they are still far removed from that genus. In general the sexual processes are the last to be altered by changing conditions, so the gametophyte stage ought to show affinities with modern forms rather than the sporophyte stage. Unfortunately few gametophytes are ever obtained, and so this method of discussing affinities is limited. When, however, the prothallus develops within a spore wall, either permanently or until fertilisation takes place, there is a better chance for its preservation, and in *Lepidodendron Veltheimianum* we get an example of such preservation.

In the Burntisland limestone blocks, strobili of a lycopodiaceous nature occur in fair abundance, but so far none