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AUSTRALASIAN ANTARCTIC EXPEDITION
1911-14.

UNDER THE LEADERSHIP OF SIR DOUGLAS MAWSON, D.Sc., B.E.

SCIENTIFIC REPORTS.
SERIES C.—ZOOLOGY AND BOTANY.
VOL. VII. PART I.

MOSSES

BY

H. N. DIXON, M.A., F.L.S., AND REV. W. WALTER WATTS.

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MOSSES.

BY MR. H. N. DIXON, M.A., F.L.S., AND REV. W. WALTER WATTS.

INTRODUCTION.

BY REV. W. W. WATTS.

IN the absence of specimens of Antarctic Mosses in Australia, and even of some of the necessary literature, the satisfactory determination of the material submitted to the Sydney Herbarium was impossible without an appeal to some European expert. In ordinary circumstances, specimens would have been sent to M. Jules Cardot, who has made the study of the Antarctic Mosses peculiarly his own; but, unfortunately, M. Cardot's residence was within the war-zone. The co-operation, therefore, of Mr. H. N. Dixon, the well-known British bryologist, was sought and most readily given. In one case, Mr. Dixon was enabled to get the valued opinion of M. Cardot, whose herbarium of rarities, I deeply regret to learn, has "fallen a prey to the Germans." If this means "destroyed," the loss is irreparable, and, in any case, the sincere sympathy of all bryologists will go out towards M. Cardot, whose fine work has won world-wide appreciation.

The specimens dealt with in these notes were collected by Mr. C. T. Harrison and Dr. S. E. Jones in different parts of Queen Mary's Land, which is situated on the Antarctic Circle between 90° and 100° E. longitude.

Although the species collected were few in number, they presented many difficulties, owing especially to the range of variation exhibited in specimens that it has been found inadvisable to separate specifically.

QUEEN MARY'S LAND MOSSES.

1. *Ceratodon purpureus* (L.) Brid., *forma*.

Herb., Syd., Nos. 8a and 9a : leg. C. T. Harrison at Watson's Nunatak, 35 miles east of the Western Base (mixed with *Grimmia fastigiata*); also Herb., Syd., No. 2 : leg. C. T. Harrison at "Delta" Bluff, 110 miles east of the Western Base.

A sterile form, coming near to *C. grossiretis* Card. (Not. Prél. in Bull. Herb. Boiss., 2me sér., vi, 14) in the form of the leaves, the stout nerve, and the peculiar hexagonal, thin-walled, lax areolation of some of the leaves. The cells do not, however,

reach the dimensions of those of Cardot's plant, though they are much larger than in the typical form; and the upper leaves usually show a much greater resemblance to those of the ordinary *C. purpureus*, both in shape and in the cell structure (in size and form of cells and in thickness of walls).

2. *Sarconeurum glaciale* (H.f.W.) Card. et Bryhn; *Didymodon* (?) *glacialis* H.f.W., Fl. Antarct. II, 408 (1847).

Herb., Syd., No. 1 : Collected by Dr. S. E. Jones at Haswell Island, 60 miles west of the Western Base.

This interesting moss is peculiar to the Antarctic region; but is, clearly, widely distributed there.

3. *Grimmia fastigiata* Card., Not. Prél. in Bull. Herb. Boiss., 2me sér., v, 1003.

Herb., Syd., Nos. 4 (c. fr.), 4a, 6 (c. fr.), 8 and 9 : leg. C. T. Harrison at Watson's Nunatak, 35 miles east of the Western Base.

Nos. 4 and 4a agree exactly with Cardot's plant, in habit, in dense fastigate branching, in form of leaves and in areolation; but they differ, apparently, in being dioicous. Careful examination revealed no ♂ flowers, but numerous ♀ ones on many of the stems. Cardot first described his plant as dioicous, but later found it to be autoicous. This appears to indicate, either a possible dimorphism, or else that the ♂ flowers are few and very inconspicuous. No. 6 is certainly autoicous, at any rate in part, and is clearly the same plant as No. 4. The species is, perhaps, to be considered heteroicous. Whatever the explanation of the varied inflorescence, the resemblances between the two plants appear to be so much more marked than the differences that Mr. Harrison's plant must undoubtedly be referred to *G. fastigiata*. It is closely allied to *G. trichophylla* Grev. The somewhat ill-developed capsules show no difference from those of that species. No. 4, has the typically yellowish colour of *G. trichophylla*; 4a is a sterile, shorter, blackish form, with shorter hair-points. Nos. 8 and 9 are also to be referred to this species.

4. *Grimmia stolonifera* C.M.

Herb., Syd., Nos. 5 and 7 : leg. C. T. Harrison at Watson's Nunatak, 35 miles east of the Western Base.

This is a fine form of Mueller's plant, which is, according to the description, much shorter, with a distinct hair-point; here it is very minute. This is the ♂ plant, and the male plant, in *Grimmia*, occasionally shows rather marked secondary characters; so that these differences may, perhaps, be due to that cause, rather than to any specific or varietal distinction. The specimens (5 and 7) were submitted to Mons. Cardot, who confirmed the determination, expressing his opinion as follows:—

“ Cette plante me paraît bien voisine du *G. stolonifera* C.M., de Kerguelen; elle n' en diffère que par l'absence presque complète de poil sur toutes les feuilles et par les

cellules du tissu un peu plus grandes; néanmoins j'hésiterais beaucoup à les séparer spécifiquement d'autant plus que le port est tout-à-fait le même."

5. *Bryum antarcticum* H.f.W., *formæ*.

Herb. Syd., No. 1*b*: leg. Dr. S. E. Jones at Haswell Island, 60 miles west of the Western Base; 3, 3*a*, 3*b*, 3*c*: leg. C. T. Harrison, "Hippo" Rock, 80 miles east of the Western Base.

These are all forms of one species of *Bryum*. 1*b* differs from the rest in the non-tomentose stems, equally foliose throughout, not aggregated in comal tufts; but one of the tufts of No. 3 is exactly intermediate between the two forms in these respects. The leaves of 1*b* (short, wide, often obtuse, with plane margin, and short nerve usually ceasing below the apex) are very different from those of 3*b*, where the leaves are mostly acuminate, with revolute margin and nerve usually excurrent; but several of the tufts in the other packets contain stems with leaves showing all stages intermediate between these two forms, while, in a few cases, notably in 3*a*, there are to be found, on the same plant, branches bearing leaves of the most fully-developed form, with others on which the leaves are just as in 1*b*. The tufts show a good deal of variability in height, degree of density, amount of tomentum, freedom, or otherwise, from earthy matter, as well as in size of leaves, density of foliation, &c.; but it is quite obvious that these are merely the results of local conditions of growth, exposure and so on.

As to the proper name for the plant. If the most highly developed form were taken, it would, without doubt, be referable to *Bryum austro-polare* Card., while 1*b* would almost as certainly be placed under *B. Gerlachei* Card., or *B. filicaule* Broth. On the other hand, the dwarf, small-leaved, compact forms, occurring especially in 3*c*, are the exact counterpart of *B. antarcticum* H.f.W.; and, this being the earliest name, all the forms must, in our judgment, be placed there.

Mr. Dixon writes: "I have unfortunately been unable to see any of the species named above (except *B. antarcticum*), and I do not feel able, therefore, to express a definite judgment; but from the careful descriptions and figures given by the authors, I have, personally, no doubt, in view of the characters revealed by the present specimens, that the following species must be considered synonymous with *B. antarcticum*, viz.: *B. filicaule* Broth., in Deutsch. Sudpol. Exped. viii, Bot., Laubm. 91; *B. Gerlachei* (Card.) Card., Résult Voyage "Belgica," Mousses, 36; *B. inconnexum* Card., in Rev. Bryol., 1900, 44; *B. austro-polare* Card., in Rev. Bryol., 1900, 45; and probably *B. algens* Card., National Antarct. Exped., Musci, 5."

From the above notes it will be seen that the mosses collected by Mr. Harrison and Dr. Jones have proved intensely interesting, and have raised some important bryological problems.

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