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THE

JOURNAL OF BOTANY

BRITISH AND FOREIGN

EDITED BY

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VOL. LVIII.

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BOTANICAL
GARDEN

LONDON
TAYLOR AND FRANCIS
RED LION COURT, FLEET STREET
1920.

National Herbarium or at the Linnean Society for the consultation and comparison of books and specimens necessary for his work. In everything connected with his herbarium—as, indeed, in other respects—Marshall was exceedingly methodical: the ample space of the Rectory enabled him to devote a room to the accommodation of his plants and books, and things not dealt with at once were carefully endorsed—*e. g.* some papers which I had sent him for notice came back to me after his death labelled “Important: for review in J. of. B. after settling at Offa’s Dyke.”

This tribute to Marshall’s memory has run to greater length than I had anticipated, but I do not think that those who knew him, either personally or by correspondence, will consider it too long: rather will they note omissions which they would have been able and willing to supply. By his death, the Editor has lost a valued friend and the Journal a principal contributor, and this memoir may fittingly conclude with a reference to the assistance rendered by Marshall to both at a critical period. It will be remembered that owing to the War and other circumstances a serious deficit was experienced at the end of 1916. By the generosity of friends and in response to a circular signed by five leading British botanists, the deficit was made up, as stated in the volume for 1917, p. 143; but it could not then be said that the circulation of the appeal, the receipt and acknowledgement of subscriptions, and other incidental trouble was entirely undertaken by Marshall, who was also, with his wife, the most liberal subscriber.

JAMES BRITEN.

(The accompanying portraits are from a photograph taken in July 1919.)

LLANBERIS LICHENS.

BY J. A. WHELDON.

THE following list was compiled in the district around Llanberis between the 3rd and the 8th of August. In company with the Misses Armitage and Cobbe, and Messrs. Druce, Jones, Rhodes and Travis, a considerable proportion of that time was devoted to the examination of the Phanerogams and Bryophyta of the vicinity. Two days were somewhat spoiled by unfavourable weather. The list cannot, therefore, be regarded as an exhaustive one, and many of the lichens known to occur in the district were not seen at all. Others, such as *Cerania vermicularis*, were unexpected, because not recorded in the *Flora of Carnarvonshire* or Leighton’s *British Lichens*, and it is singular that so conspicuous a species, occurring close by the path from Llanberis to the Snowdon summit in some abundance, should have been overlooked. The comparatively few corticole species included, is due to the fact that most of our time was spent on the hills, above the tree zone, and not to any poverty of species in this group. The arrangement is that of A. Lorrain Smith’s *British*

Lichens; and species not recorded for Carnarvonshire in Griffith's *Flora* are indicated by an asterisk:—

Sphærophorus globosus A. L. Sm. Frequent on boulders.—*S. fragilis* Pers. On Clogwyn and Cwm Glas, frequent.

Ephebe lanata Wain. Damp shady rocks near Llanberis Castle.

**Polychidium muscicolum* S. F. Gray. Mossy boulder on Snowdon.

Pannaria pezizoides Light. Near the stream by Crib Coch.

Peltigera canina Willd. Llanberis; Cwm Glas and Snowdon.—

**P. polydactyla* Hoffm. Banks in Llanberis Pass and below Clogwyn.—*P. aphthosa* Willd. Shaded banks in Llanberis Pass.

Solorina saccata Ach. Damp ledges on volcanic ash. Cwm Glas.

Parmelia physodes Ach. Common, with forms *labrosa* and *recurva*.—*P. pubescens* Wain. Snowdon at about 2550 ft.; sparingly near Clogwyn Tarn.—*P. perlata* Ach. Frequent near Llanberis.—

P. caperata Ach. Very fine on both trees and rocks.—*P. proboscidea* Tayl. Sparingly on trees near Llanberis Castle.—*P. saxatilis*

Ach. and forma *furfuracea* Schær. General, on trees and rocks.—*P. cetrarioides* Del. Rocks at foot of Snowdon, above Llanberis Falls.—*P. sulcata* Tayl. Noted only once on a wall near Nant

Perris.—*P. lævigata* Ach. Rather frequent on boulders and trees near Llanberis.—*P. revoluta* Floerke. On mossy boulders near

Llanberis Falls.—*P. conspersa* Ach. Common and fruiting well about Llanberis; var. *stenophylla* Ach. near the Castle. f. *isidiata*

Leight. On boulders at the foot of Snowdon.—*P. omphalodes* Ach. Very frequent throughout the district, and occasionally fruiting well.—*P. fuliginosa* Nyl. Common on rocks and walls. The

var. *late-virens* Nyl. frequent on trees.

Cetraria glauca Ach. Common on both rocks and tree-trunks.—*C. islandica* Ach. Sparingly in Cwm Glas, and on Snowdon

at 3250 ft., var. *tenuifolia* Wain. Amongst *Racomitrium lanuginosum* at about 3500 ft. on Snowdon.—*C. aculeata* Fr. Common,

ascending to the summit of Snowdon.

Evernia prunastri Ach. Tree-trunks at Llanberis.—*E. furfuracea* Mann. On a wall at the foot of Cwm Glas.

**Usnea hirta* Ach. Trees near Llanberis.—*U. ceratina* Ach. On rocks in Llanberis Pass.

Alectoria bicolor Nyl. Near the summit of Snowdon and in Cwm Glas.—**A. chalybeiformis* Th. Fr. Snowdon at above 3000 ft.

**Cerania vermicularis* S. F. Gray. On the bare shoulders of Snowdon immediately below the Summit Station, in some abundance,

and ranging between 3200 to 3500 ft. or higher. It occurs on ground covered with small stones, associated with *Salix herbacea*,

Racomitrium lanuginosum, *Anthelia Juratskana*, *Marsupella ustulata*, *Cladonia uncialis* var. *turgescens*, *Lecidea demissa* and other alpine species.

Xanthoria parietina Th. Fr. Occasionally on walls, gate-posts, and rocks, especially near villages and farms.

Placodium pyraceum Anzi var. *pyrithromum* A. L. Sm. An athalline form on a foreign white thallus, the apothecia in small groups, amongst decaying mosses above 3000 ft. on Snowdon.—*P. ferrugineum* Hepp. Very sparingly on a tree near the Castle.

Candelariella vitellina Müll.-Arg. Frequent around Llanberis.

Physcia pulverulenta Nyl. Somewhat rare on trees in Llanberis Pass.—**P. stellaris* Nyl. var. *cercidia* Nyl. Observed once near Nant Perris.—*P. hispida* Tuckerm. Frequent, the f. *leptulea* (Ach.) on trees, and f. *tenella* (Scop.) on rocks near Llyn Padarn.

**Rinodina demissa* Arn. On slate near Llyn Padarn.

Lecanora gelida Ach. Rocks in Llanberis Pass and above the tarn in Cwm Glas Mawr.—*L. subfusca* Ach. var. **chlarona* Ach. Trees near Llanberis. Var. *allophana* Ach. Trees near the Castle.—*L. rugosa* Nyl. Apparently rare, seen once on trees near Llanberis.—*L. atra* Ach. Frequent, and ascending to 3500 ft. on Snowdon.—**L. Hageni* Ach. On small stones in Llanberis Pass.—**L. carpineae* Wain. On branches of trees, frequent.—**L. varia* Ach. Sparingly on old worked wood near Llanberis.—**L. farinaria* Borr. var. *conizæoides* A. L. Sm. On larch near Llanberis.—*L. sulphurea* Ach. Rocks and walls in Llanberis Pass and below Cwm Glas.—**L. epanora* Ach. Noticed in several places in Cwm Glas, and on the ascent of Snowdon from Llanberis.—*L. polytropa* Schær. Seen very sparingly on Snowdon.—*L. badia* Ach. Frequent on boulders, Llanberis Pass, Snowdon, and below Clogwyn.—**L. atriseda* Nyl. Wall in Llanberis Pass, with *Lecidea geographica*.—*L. tartarea* Ach. Frequent, and fruiting well on tree-trunks and rocks; the var. *frigida* Ach. on Snowdon above Cwm Glas Mawr.—*L. parella* Ach. Occasional on walls and rocks.—*L. lacustris* Th. Fr. Abundant on stones below Llanberis Waterfall, and at intervals in the bed of the stream down to the lake.—*L. Dicksonii* Nyl. Frequent, ascending from near the Llyn Padarn to the summit of Snowdon.

Acarospora fuscata Th. Fr. Rocks in Cwm Glas.—**A. smaragdula* Massal. Rocks below Clogwyn.

Pertusaria globulifera Nyl. Rare, on trees near Llanberis.—*P. faginea* Leight. Rather frequent on trees.—**P. multipuncta* Nyl. Trees near the base of Snowdon, rare.—**P. lactea* Nyl. Frequent, but always sterile, ascending to the summit of Snowdon.—*P. communis* Dalla Torre and Sarnth. Only noticed once on a tree near Llanberis.—*P. dealbata* Cromb. Boulders in Llanberis Pass. Frequent on Snowdon and Clogwyn.—*P. leioplaca* Schaer. Trees near Nant Perris.

Crocynia lanuginosa Hue. Shady mossy wall in Llanberis Pass.

**Racodium rupestre* Pers. Rocks in Cwm Glas.

Gyrophora polyphylla Hook. f. *congregata* T. & B. Rocks below Clogwyn, and near the foot of Crib Goch.—*G. cylindrica* Ach. Near the summit of Snowdon and on rocks below Clogwyn. forma *denudata* Mudd and var. *fimbriata* Ach. Clogwyn. *Var. *denticulata* Ach. Rocks above Cwm Glas near the summit of Snowdon.—**G. torrefacta* Cromb. Observed very sparingly below Clogwyn.

Bæomyces roseus Pers. Seen in a sterile condition only on Snowdon.—*B. rufus* DC. Rocks in Llanberis Pass.

Stereocaulon condensatum Hoffm. With *Cerania vermicularis* at 2250 ft. on Snowdon.—*S. coralloides* Fr. Snowdon.—**S. evolutum* Graewe. Frequent on walls and rocks.—*S. denudatum* Floerke. Cwm Glas and Clogwyn, rather frequent. *Var. *pulvinatum* Th. Fr. Rocks above 3000 ft. on Snowdon, and on boulders near Nant Perris.

Cladonia sylvatica Hoffm. Very frequent.—*C. uncialis* Web. Frequent. The var. *turgescens* Fr. and *f. *obtusata* Ach. high up on Snowdon, rare.—*C. pyxidata* Hoffm. Banks and walls near Llanberis. Var. *chlorophæa* Floerk. and *f. *lepidophora* Floerk. on walls in Llanberis Pass.—*C. fimbriata* Fr. form *macra* Floerk. With the preceding, and also *var. *subcornuta* Nyl. f. *antilopæa* (Mudd).—**C. lepidota* Nyl. f. *hypophylla* Cromb. Cwm Glas, Clogwyn, and on Snowdon near the railway at 3500 ft.—*C. cervicornis* Schaer. Common on rocks and boulders.—*C. sobolifera* Nyl. Cwm Glas. I do not understand the limitations of this and the preceding. The plant we have always called *C. cervicornis* invariably gives a very distinct yellow reaction with KHO, and I have referred all those without such reaction to *C. sobolifera*.—*C. gracilis* Willd. Frequent on walls and mossy rocks.—*C. furcata* Schrad. Cwm Glas.—*C. digitata* Hoffm. Near Llanberis Castle.—**C. squamosa* Hoffm. Mossy wood in Llanberis Pass.—*C. coccifera* Willd. Clogwyn and Cwm Glas.—**C. flabelliformis* Wain. Mossy boulders above Llanberis Falls.—**C. macilenta* Hoffm. Wood near Llyn Padarn.

Lecidea demissa Th. Fr. Snowdon at 3250 ft.—*L. lucida* Ach. Walls between Llanberis and Nant Perris.—*L. coarctata* Nyl. var. *elacista* Cromb. Slaty rocks below Clogwyn. Var. *glebulosa* Cromb. Llanberis Pass and amongst decaying hepatics &c. near the summit of Snowdon.—**L. granulosa* Schaer. and **L. uliginosa* Ach. Cwm Glas.—*L. parasema* Ach. Trees near Llanberis.—**L. goniophila* Schaer. Rocks below Clogwyn and on Snowdon at 3300 ft.—**L. leucophæa* Nyl. Snowdon above 2000 ft.—*L. consentiens* Nyl. Snowdon at about 3000 ft.—*L. contigua* Fr. Abundant on rocks, walls, and small stones, with the var. *flavicunda* Nyl. A form with minute apothecia occurs.—*L. sorediza* Nyl. Rare. Rocks below Clogwyn.—*L. confluens* Ach. Common, with f. *oxydata* Leight. The var. *rimoso-areolata* Leighton on Snowdon.—*L. lapicida* Ach. Boulder in Llanberis Pass; Snowdon.—*L. lithophila* Ach. Snowdon at 3250 ft., f. *ochracea* Floerk., on rocks below Clogwyn.—**L. plana* Nyl. Cwm Glas and Clogwyn.—*L. lactea* Floerke. Rocks near the Snowdon railway at about 3300 ft.—*L. aglæa* Sommerf. Rocks below Clogwyn.—*L. rivulosa* Ach. Frequent, and often associated with *Lecanora badia* and the next species.—*L. Kochiana* Hepp. Ascends to above 3250 ft. on Snowdon. The var. *lygæa* Leight. occurs on rocks below Clogwyn.

Megalospora sanguinaria Massal. Boulders in the wood near Llanberis Castle.

Biatorina lenticularis Koerb. var. *acrustacea* Hepp. Rocks on Snowdon at about 2300 ft.—*B. contristans* A. L. Sm. On decaying *Andreæa* near the summit of Snowdon.

**Bilimbia cambrica*, sp. nov. Thallus indeterminatus granulato-squamulosus vel squamulosus, squamulis contiguus vel dispersis flavido-cinereis, marginis prominentes pallidioribus. Apothecia nigra primo plana marginata deinde convexa immarginata et ætate tuberculata, sæpe conglomerata. Epithecium in plagas tenues dissectum brunneum. Hypothecium saturate nigro-fuscum. Paraphyses bene discretæ subcapitatæ graciles, apicibus fusciscentibus. Spori 24-36 × 5-7 μ fusiformes 3-septatæ.

Thallus yellowish grey, subeffuse, squamulose, squamules roundish and nodulose or larger and irregularly flexuose, adnate, depressed in the centre, whitish at the elevated margins, scattered or congregate. Apothecia rather small, black, opaque, scattered or several together, in age convex and tuberculate with the margin excluded. Epithecium brown in section; hypothecium black, becoming brown upwards. Paraphyses slender, subcapitate. Spores fusiform, 3-5 septate; 24-36 × 5-7 μ . On rocks of volcanic ash on Snowdon, above 3000 ft. This lichen is very near *Bilimbia leucophæopsis* A. L. Sm., the only locality for which is on Ben Lawers. Like that species it is associated with *Sirosiphon saxicola*, which forms dark patches between the thalline squamules. It may be only a variety of that species, but is distinguished from it by the whitish margins of the squamules, and the darker thallus.

Bilimbia melæna Arnold. On decaying mosses and hepatics on Snowdon.—*B. lignaria* Massal. Encrusting decaying mosses high up in Cwm Glas, and over-running *Cladonia* and mosses amongst *Cerania* on Snowdon.

Bacidia umbrina Branth & Rostr. Rocks in the wood by Llyn Perris, vars. *turgida* Th. Fr. and *compacta* Th. Fr. On walls amongst small mosses in Llanberis Pass.

Buellia myriocarpa Mudd. On a tree-stump near Llanberis.—*B. colludens* Tuck. Rocks in Cwm Glas.

Rhizocarpon geographicum DC. Common, with forms *contigua* Leight. and *urceola* Leight.—**R. Ederi* Koerb. Boulders in Llanberis Pass, on Clogwyn, and near the summit of Snowdon.—*R. petræum* Massal. By the lake in Llanberis Pass.—*R. confervoides* DC. On stones near Llanberis, and on Snowdon.

Arthonia radiata Ach. and var. *Swartziana* Sydow. On oaks near Llanberis Castle; also a brown form on alders near Nant Perris, Mr. G. Travis.

Graphis scripta Ach. Woods near Llanberis Castle.

Phæographis inusta Müll.-Arg. *var. *macularis* A. L. Sm. With the preceding species.

Dermatocarpon aquaticum A. Zahlbr. Stream between Crib Goch and Cwm Glas.

**Verrucaria lævata* Ach. Stones in the stream near Llanberis Castle.

Arthopyrenia epidermidis Mudd. On birch and oak near Llanberis and Nant Perris.—*A. submicans* A. L. Sm. On smooth bark near Llanberis Castle; also found on alders near Nant Perris by Mr. Travis.

Porina carpineæ A. Zahlbr. Trees near Llyn Padarn.