GEORGE JOHNSTON'S LICHEN HERBARIUM AT THE R.B.G., EDINBURGH

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ABSTRACT. A folder of lichens assembled by George Johnston of Berwick has been rediscovered and its contents revised and cross-referenced to his published works. A short biographical account of Johnston is given with emphasis on his lichenological activities.

Dr George Johnston (1797–1855), founder of the Berwickshire Naturalists' Club and the Ray Society, three times mayor of Berwick and for nearly 40 years a medical practitioner in that town, was an all-round naturalist of outstanding ability. After completing his medical qualifications (1824) he divided his working time between his patients and a study of natural history. His first publication was *A Flora of Berwick-upon-Tweed*; Vol. 1 (1829) of which deals with higher plants and Vol. 2 (1831) with cryptogams. It covers the County of Berwickshire, the area of north Northumberland which in those days was known as North Durham, and the Cheviot Hills. Shortly after this Flora was published his interest turned to marine invertebrates on which he became a world expert. Research into invertebrate zoology dominated his scientific work during the 1830s and 1840s but he maintained an interest in botany and in 1853 published the first volume (botanical section) of a work on *The Natural History of the Eastern Borders* which brought his earlier Flora up to date. Unfortunately he died when only 58 so the subsequent volumes were never published. He was survived by his wife, who had illustrated his first Flora, and four children. Further biographical details are given by Hardy (1892), Embleton (1856), Yonge (1955) and Welford (1895).

It is not known when Dr Johnston's interest in lichens was first aroused but it is likely that he became familiar with all groups of plants at an early age. Though in no way a dedicated lichenologist his importance is that he was the first person to investigate the lichens of the Berwick-upon-Tweed area from which he had by 1831 recorded 83 species.

The Winch correspondence (LINN) contains a letter from Dr Johnston dated 18.2.1830 that clearly accompanied a parcel of lichens and so it is quite likely that N. J. Winch, who lived on Tyneside, may have given him encouragement. Indeed, the 1829–31 Flora is dedicated to Winch who is thanked in the preface for refereeing material. Later, Johnston's zoological studies left him little time for lichens as this extract from a letter to J. Hardy dated 29.2.1840 (Hardy, 1892) shows:—

> "I am quite aware of the incompleteness of my list of Berwickshire lichens and would be glad had I the leisure to join you in their investigation . . . as I do not despair of sometime or other returning to these pets of flora I would be particularly obliged by your keeping and preserving specimens of all you may gather for me."

This letter may have spurred Hardy, who had a great admiration for Johnston, into collecting the material and records which were published 23 years later as *The Lichen Flora of the Eastern Borders* (Hardy, 1863).

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Dr Johnston is known to have accumulated a lichen herbarium as Hardy (1863) refers to it and it was consulted by Leighton in the preparation of *A Monograph of British Graphideae* (1845) and his British lichen Flora (see Leighton, 1872: vii). However, its whereabouts was unknown until it was recently found in a cupboard at the Royal Botanic Garden, Edinburgh (E). It comprises 96 sheets bound in a folder with "*IV Lichens*" on the spine. The title page is inscribed "*The Lichens of Berwickshire and North Durham, G. Johnston*, 1831" in the doctor's bold hand. Little information is given on localities or dates, but the arrangement exactly matches that in the 1831 Flora to which the specimens are cross referenced by page numbers, thus enabling one to check Dr Johnston's species concepts against those of today and greatly increasing the value of the records of his floras. As Dr Johnston only collected in the Berwick area it is safe to assume that the localities in the flora are those from which the specimens came and that they mostly date from around 1831. The last 11 specimens in the herbarium are better documented and mostly support additional records in his 1853 flora; the majority of them were contributed by the Rev. Thomas Brown (minister of Langton). The sheets bear the occasional annotations by Leighton and Hardy.

According to Desmond (1977) the whereabouts of Johnston's herbarium is unknown, though Hedge and Lamond (1970) state that at least some of his flowering plants are in E. Letters in a file in the Edinburgh Herbarium pertain to the acquisition on permanent loan of the Berwick Herbarium from the Berwick-upon-Tweed Town Council in March 1943. However, it is possible that some of Johnston's material was removed prior to this date and remains lost. This may be the fate of his bryophytes, because they are only poorly represented in E. In addition to the folder of lichens, three folders of fungi and one of algae were found, each of which are cross-referenced to the 1831 Flora. The Berwick Herbarium, now at E, contains flowering plants collected by Phillip Maclagan (1818–1892) and a collection of *Salix* by Andrew Brotherton (1834–1891).

Examination of the herbarium has enabled us to confirm directly the past presence of many species in Berwickshire. This is a very underworked county for lichens and as the bulk of the lichen herbarium of the only other early collector, James Hardy, has almost certainly been destroyed, Dr Johnston's 150 year-old herbarium is of considerable importance. We have revised the material in the light of current taxonomic ideas: excluding purely nomenclatural changes, about a quarter of the approximately 100 specimens have been re-determined. The list below gives the correct names and could be used to amend Dr Johnston's Floras.

Compared with the lichen flora of south-east Scotland today many of the preserved specimens appear surprisingly luxuriant and many normally shy-fruiting species are represented by fertile material. A depression of fruiting followed by a reduction in luxuriance is in many cases the earliest sign of a lichen flora coming under stress from low levels of sulphur dioxide air-pollution.

Several of the species represented are apparently now very rare in south-east Scotland and Northumberland, being restricted to old undisturbed relic woodland owing to their intolerance of disturbance, low levels of sulphur dioxide, and agricultural chemicals. These species are the *Lobaria* spp., *Nephroma* spp. and *Sticta* spp., reported by Johnston from such localities

(with approximate national grid-references) as Penmanshiel Wood (36/76), woods above The Retreat (36/76), woods by River Dye above Longformacus (36/65), and Langton-Lees Cleugh (36/74·52). These woodlands are still extant and require careful study to establish the present status of their lichen floras.

The specimens of *Ramalina fraxinea* and *R. siliquosa* are notably luxuriant. Similar large specimens of the latter were seen by one of us (B.J.C.) on cliffs near the sea at Tyninghame in East Lothian in 1975.

Leptogium plicatile, found by Johnston on wet rocks at Hudshead (46/01·50) is a very rare species in Britain, but has been recently found in Northumberland, on rocks in the River North Tyne near Chipchase Castle, by Dr N. Holmes (specimen in E). The name *L. plicatile* (Ach.) Leight. has often been erroneously applied to a much commoner species of calcareous rocks (especially crumbling mortar of old walls) whose correct name is probably *L. turgidum* (Ach.) Cromb.

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The Collection

The list below gives the species in the order of their appearance in Johnston's folder. The numbers refer to the pages in his 1831 Flora (where the localities from which the specimens were presumably collected can be found), while the italicized name is that used by Johnston, and is placed in square brackets if incorrect according to the species concepts of his time; in cases where Johnston merely used a specific epithet now transferred to a different genus, the original name is not given. Where habitat notes or other comments are given with the specimens these are included. Fertile specimens are designated by an asterisk if they belong to species which today are seldom seen fruiting in the area. A dagger denotes a labelled page of the folder without a supporting specimen.

Peltigera membranacea (Ach.) Nyl.*, 73, *P. canina.*
P. hymenina (Ach.) Del.*, 74, [*P. rufescens*].
P. hymenina (Ach.) Del.*, 74, [*P. rufescens*].
P. spuria (Ach.) DC., 74.
Nephroma laevigatum Ach., 75, *N. resupinata.*
N. parile (Ach.) Ach., 75, [*N. resupinata*].
Lobaria scrobiculata (Scop.) DC., 75.
L. pulmonaria (L.) Hoffm., 75.
Cetraria islandica (L.) Ach., 76.
Platismatia glauca (L.) Culb. & Culb., 77.
Leptogium plicatile (Ach.) Leight., 77, [*Collema crispum*].
Collema limosum (Ach.)Ach., 78. [*C. nigrum*].[1]
C. tenax (Sw.) Ach., 78, [*C. melaenum*].[2]
Pseudevernia furfuracea (L.) Zopf var. ceratea (Ach.) D. Hawksw., 78.
Anaptychia ciliaris (L.) Korb., 79.
Physcia tenella (Scop.) DC.*, 79.
Parmelia exasperata De Not., 79, Langleeford, vi 1832, *P. olivacea.*
P. subaurifera Nyl., 79. *P. olivacea.*
Xanthoria parietina (L.) Th. Fr., 80.
Anaptychia fusca (Huds.) Vain., 80, *Parmelia aquila.*
Physcia aipolia (Ehrh. ex Humb.) Fürnrohr, 81, [*P. stellaris*].
Physconia pulverulenta (Hoffm.) Poelt, 81.
Parmelia saxatilis (L.) Ach.*, 81.
P. sulcata T. Tayl., 81, *P. saxatilis, var.*
P. conspersa (Ehrh. ex Ach.) Ach.*, 82.
P. omphalodes (L.) Ach., 82.
Hypogymnia physodes (L.) Nyl., 83.
Lecanora atra (Huds.) Ach., 83, on rock.
L. chlarotera, Nyl., 83 on bark [*L. atra*].
L. chlarotera Nyl., 83, *L. subfusca.*
L. muralis (Schreb.) Rabenh. Near Wooler, Northumberland, [*Psora decipiens*].[3]
Haematomma ventosum (L.) Massal., 84.
Ochrolechia parella (L.) Massal., 84.
O. tartarea (L.) Massal.*, 84.
Caloplaca citrina (Hoffm.) Th. Fr., 84†.
C. saxicola (Hoffm.) Nordin, 85, *Lecanora murorum*†.
Huilia albocaerulescens (Wulf.) Hertel., 86, [*Lecidea confluens*].
Mycoblastus sanguinarius (L.) Norm.*, 86.
Rhizocarpon petraeum (Wulf.) Massal., 87†.
Lecidella elaeochroma (Ach.) Choisy, 87, *Lecidea parasema*; var. *olivacea* Fries, det. Leighton.
Lecidea sulphurea (Hoffm.) Wahlenb., 88†.
Rhizocarpon oederi (Web.) Körb., 88†.
Buellia alboatra (Hoffm.) Deichm. Br. & Rostr., 88, *Lecidea atro-alba*†.
Rhizocarpon geographicum (L.) DC., 88, *Lecidea atro-virens*; var. *geographica*, det. Leighton.
Pertusaria lactea (L.) Arnold., 88, *Lecidea conspurcata*†.
Lecanora carpinea (L.) Vain., 89, [*Lecidea luteola*].[4]
Caloplaca caesiorufa (Wibel) Flag., 89†.
Lecanora dispersa agg., 89, [*Lecidea anthracina*].[5]
Everina prunastri (L.) Ach., 89.
Ramalina fraxinea (L.) Ach.*, 90, spec. 14 cm long.
R. siliquosa (Huds.) A. L. Smith.*, 90, spec. 15 cm long, *R. scopulorum.*
R. cuspidata (Ach.) Nyl.*, 90, *R. scopulorum.*
R. fastigiata (Pers.) Ach.*, 91.
R. calicaris auct., non (L.) Fr.*, 91, [*R. fastigiata*].
R. farinacea (L.) Ach., 91.
Cornicularia aculeata (Schreb.) Ach.*, 91.
C. normoerica (Gunn.) Du Reitz*, 92, *C. tristis.*
Bryoria fuscescens (Gyeln.) Brodo & D. Hawksw., 92, *Alectoria jubata.*
Usnea subfloridana Stirt., 93, [*U. hirta*].
U. subfloridana Stirt.[6]
Cladonia portentosa (Duf.) Zahlbr.*, 93, [*C. rangiferina*].

C. rangiformis Hoffm., *C. furcata* β *racemosa*; a late insert by Hardy.
C. uncialis (L.) Web.*, 95.
C. gracilis (L.) Willd.*, 96.
C. bellidiflora (Ach.) Schaer., 96.
C. coccifera (L.) Willd., 96.
C. macilenta Hoffm., 96, [*C. digitata*].
C. chlorophaea (Flörke ex Sommerf.) Spreng., 97, *C. pyxidata*.
C. fimbriata (L.) Fr., 97†.
Sphaerophorus globosus (Huds.) Vain.*, 97, *S. coralloides*.
S. melanocarpus (Sw.) DC., 97.[7]
Baeomyces rufus (Huds.) Rebent.*, 98.
Pertusaria corallina (L.) Arnold, 98.
Umbilicaria proboscidea (L.) Schrad.*, 99.[8]
U. cylindrica (L.) Del. ex Duby*, 99.[8]
Opegrapha persoonii (Ach.) Ach., 99†.
O. atra Pers., 100.
O. vulgata (Ach.) Ach., 100, *O. notha*.[8]
Graphina anguina (Mont.) Müll. Arg., 100, *Opegrapha scripta*; a spore figured by Leighton.
Opegrapha macularis (Ach.) Ach., 100.[9]
Arthonia radiata (Pers.) Ach., 101, *A. astroidea*.
A. radiata (Pers.) Ach., 101, *A. swartziana*.
A. radiata (Pers.) Ach., a late insert, *A. swartziana*.
A. tumidula Ach., 101.
Pertusaria amara (Ach.) Nyl., 101.
Thrombium epigaeum (Pers.) Wallr., 102†.
Leptorhaphis epidermidis (Ach.) Th. Fr., 102.
Pertusaria pertusa (L.) Tuck., 102.
P. leioplaca (Ach.) DC., 103.[10]
Dermatocarpon fluviatile (Web.) Th. Fr., 103, *Endocarpon weberi*.
Lepraria candelaris (L.) Fr., 103, *L. flava*.

The following specimens found at the end of the folder are more fully documented, and mostly support records in Johnston (1853), to which we have provided page references and Johnston's reference numbers.

Pertusaria albescens (Huds.) Choisy & Wern., 269, no. 92, Berwickshire, 1853, *Variolaria discoidea*.
Peltigera hymenina (Ach.) Del., 265, no. 8, 1853, [*P. horizontalis*].
Aspicilia laevata (Ach.) Arn. Originally undetermined but Leighton has appended "Apparently a rubbed specimen of *Parmelia cinerea*."
Collema furfuraceum (Arnold) Du Reitz, 266, no. 25, Langton Woods, T. B. [Thomas Brown], 1853, [*C. nigrescens*].
Calicium viride Pers., 267, no. 59, Stitchel House, Mr Brown, 1853, [*C. sphaerocephalum*].
Parmelia caperata (L.) Ach., 265, no. 15, Hairy-heugh crags, T. B., 1853.
P. loxodes Nyl.*. Sweethope Hill, Berwickshire. Thos. Brown. This specimen was originally undetermined but Leighton has appended "I think a state of *Parmelia faulensis*" and Hardy has added "This is *Parmelia olivacea*."
Sticta sylvatica (Huds.) Ach. Harthope Linn above Langleeford Hope, J. Hardy. This record is first mentioned in Hardy (1863, p. 401).
S. fuliginosa (Dicks.) Ach., 265, no. 14, Langton-Lees' Cleugh, T. Brown, 1853. (The specimen approaches *S. sylvatica*—det. B.J.C.).
Leptogium lichenoides (L.) Zahlbr., 266, no. 28. Originally undetermined but Leighton named it *Collema lacerum*.
Umbilicaria polyphylla (L.) Baumg., 265, no. 4, Abbey St. Bathans, T. Brown, 1853.

[1] Appended note in Hardy's hand "Mr Mudd examined a portion of this microscopically and considers it to be *C. pulposum*".
[2] Incorrectly redetermined by Hardy as *C. cristatum*.
[3] Correctly redetermined by Leighton; the specimen refers to a record given in Johnston (1853, p. 268).
[4] Redetermined by Leighton as "some state of *Lecanora subfusca* I think".
[5] Appended note in Hardy's hand "A fragment sent to Mr Mudd. He considers it to be his *Lecanora albella* v. *crenulata*".
[6] From rocks below Marshall Meadows; specimen inserted at a later date and labelled *U. hirta* by Johnston, and redetermined by Hardy as *U. barbata* var. *hirta*.
[7] A small specimen incorrectly labelled *S. fragile*. Note by Hardy "This is the closest approach to *S. compressus* I have seen".
[8] Identification confirmed by a note in Leighton's hand.
[9] This name is a synonym of the non-lichenised coelomycete *Polymorphum rugosum* (Fr.) D. Hawksw. & Punith., to which Johnston's specimens are referable.
[10] Specimen from Retreat, Berwickshire; incorrectly redetermined as *P. pustulata* by Hardy.

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