British Lichen Society *Bulletin* no. 113 Winter 2013

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Welcome to the Winter 2013 Bulletin. This issue has a focus on lichens of urban and sub-urban environments, and the changes in species composition as our air quality improves. We are fortunate to be able to reproduce the chapter on lichens from the *Flora of Birmingham and the Black Country*, published earlier this year and building on the article that Peter James and Mark Powell contributed to the Winter 2010 issue of the *Bulletin*. The lichens of this region will be largely similar to those in many other city surrounds within Britain, and it should be helpful to non-specialists trying to make sense of the species around them. Perhaps the most significant aspect of this work, however, is the increase in species recorded – something like five times the number of taxa have now been recorded from the region compared with the 1970s. Some of this is undoubtedly linked to increase in survey effort and species concepts have changed, but the decrease in SO_2 pollution must also have played a big part. A further example of presumed lichen immigration to formerly polluted areas is provided by David Hawksworth, documenting a new find of *Normandina pulchella* from Derbyshire, never previously recorded from the Midland Counties.

The news is good for lichens regarding SO_2 pollution, but major concerns remain regarding excess nitrogen in the environment. Plantlife have kindly given permission for one of their documents to be reproduced in this issue, which explains the significance of N pollution and the efforts being made to control the problem. This is now primarily a political issue: consider writing to your MP to express your concerns.

In January next year, the BLS AGM will be accompanied by a a two-day symposium "New Developments in Lichenology: systematics, ecology and use as indicators of environmental quality". This promises to be a most interesting meeting with a strong showing from our non-UK members, providing a good window upon current lichen research projects and their associated students. Please sign up for this meeting as soon as you can – it helps the organizers and makes sure there will be room for you! Abstracts of most of the papers are printed towards the end of this *Bulletin*, and there should be a flyer in the envelope giving all of the necessary details.

Front cover: Detail derived from a painting by Antoni Pitxot, displayed in the Teatre-Museo Dalí in Figueres, Catalunya, Spain. Pitxot was a long-term friend and collaborator of Salvador Dalí, co-designing the Teatre-Museo and becoming its director after Dalí's death. Many of his paintings are based on sculptures formed from lichen-covered rocks. Learn more at http://www.salvador-dali.org/museus/figueres/en_pitxot.html

Lichens of Birmingham and the Black Country

The *Flora of Birmingham and the Black Country* by Ian Trueman, Mike Poulton and Paul Reade was published in July 2013 by Pisces Publications. It covers Birmingham, Dudley, Sandwell, Walsall and Wolverhampton and includes portions of the three botanical vice-counties of Warwickshire, Worcestershire and Staffordshire. The core of the Flora deals with a 1 km square survey of the vascular plants, but we were very keen to include at least checklists of the bryophytes and, ignoring the fact that they are not plants, of the fungi and the lichens.

Peter James, who lives in the conurbation and who produced, with Mark Powell, the detailed survey of the lichens of Sutton Park which was published in the Bulletin in 2010, undertook some further site surveys and these records, together with other recent surveys, forms the basis of an eighteen page chapter in the Flora. In the Flora Peter also includes a brief introduction to lichens and it is hoped that the chapter will arouse interest in lichens in the conurbation. Hopefully it will lead to new people taking up the subject and to further surveys charting the remarkable changes currently taking place in what was until quite recently regarded as a lichen desert. We would like to thank all the people who contributed to this chapter and hope that they are pleased with the way we have presented their surveys. A slightly edited version of the chapter is reproduced below with grateful thanks to the contributors; it will be relevant to all those studying the lichens of urban areas.

Ian Trueman (for the Flora authors)

Lichens absorb moisture and associated inorganic nutrients over the entire surface of their thalli, thus making them extremely sensitive to the chemical characteristics of both the surrounding air as well as the composition of their immediate substrates. Base-poor siliceous and base-rich calcareous rocks have different, often distinctive, lichen communities. There are also more subtle differences according to the natural base and nutrient status of the bark of different tree species; for example oak, beech and birch have base-poor 'acid' bark whereas ash, willow and sycamore bark is base-rich, resulting in different associated lichen communities. There is a contrast between the lichens of trees in woodland and on isolated trees at field margins. Also, historically, very long-established woodlands (e.g. in the New Forest, Hampshire) have special 'indicator' species whose particular presence signifies the antiquity of such forests (see James & Davies, 2003).

Lichens are particularly sensitive to two major sources of environmental pollution. During the industrial revolution increasing atmospheric levels of sulphur dioxide (SO_2) were noted, which has had a considerable and largely adverse impact on the abundance and species diversity of the lichen communities affected.

Subsequently, post 1970, the levels of SO_2 have fallen considerably and the communities are now being replaced by lichens which reflect the increasing concentrations of major agricultural pollutants, principally nitrogen compounds resulting from present day farming methods and, to a lesser extent, car-exhaust gases. This current phase is probably somewhat similar to the environmental situation which existed prior to the industrial expansion in the 19th century.

Hawksworth & Rose (1970) were able to map ten zones of SO_2 concentration across Britain by using the presence and abundance of selected lichen species occurring on trees. On their scale Birmingham and the Black Country was included in zone 0 – 2, equivalent to 150 µg m^{-3} or more of SO_2 which was characterised by a much reduced species diversity and coverage together with the widespread abundance of the SO_2-tolerant indicator lichen *Lecanora conizaeoides* on a wide range of different substrates.

Nevertheless Birmingham and the Black Country (B&BC) has never been a true 'lichen desert'. Horizontal branches in favoured situations have always been richer in lichen species and cover. Also many saxicolous species have been able to persist on base-rich substrates, particularly concrete and mortar, as well as more or less basic gravestones in old churchyards. These are all substrates which are able, to some degree, to neutralise the impact of atmospheric SO_2 pollution.

Since 1970 there has been a notable reduction in B&BC of atmospheric SO_2 levels, now 20-70 µg m^{-3}, varying according to wind direction. Consequently many previously SO_2-susceptible species have recolonised, while *Lecanora conizaeoides*, which is now mainly restricted to the rough bark of birch and ancient soft-wood palings and boards, has decreased significantly.

The increase in the number of species recorded since 1970 also partly reflects the intensity of the influence and local concentrations of nitrogen compounds, as well as decreased levels of SO_2 pollution. Certain species, e.g. *Xanthoria parietina* and *X. polycarpa* are important indicators of high levels of nitrogen pollutants and are especially common near farms and their out-buildings, together with a greatly increased coverage by algae species not associated in lichen symbioses. A similar extensive local green algae cover can appear, to the detriment of affected lichen communities, after the dispersal of fertiliser on fields at sources often some distance away and affected by the wind direction at the time. Such an event was observed in 2011 on Barr Beacon (SP0697) with a deleterious effect on the lichen communities of some rowan trees, hawthorn hedging and old fencing. Early stages in the development of lichen diversity on particular street trees in the Four Oaks area has also been recently replaced by a dominating cover of green algae, especially in 2012. It appears that the general trend of improvement is still volatile and capable of rapid reversal.

Lichens are also often consumed by slugs and snails, which particularly prefer the photobiont areas of their thalli. This can be seen in *Lecanora muralis* (Chewing-gum Lichen) where the placodioid thallus often has reduced marginal lobes and an upper surface with a mosaic of white areas due to the exposure of the thallus medulla as a result of persistent mollusc browsing. 2012 was exceptionally wet and a stressful year for lichen communities. This was reflected in a significant increase in algae and bryophyte cover (for example *Grimmia pulvinata* and *Ceratodon purpureus*), especially on walls and older, isolated tree boles in open situations. It was noted that newly established lichen communities in such open sites were also significantly reduced or lost as the result of a big increase in snail and slug activity, due to such weather conditions.

With all these changes currently taking place, these are exciting times for lichenologists! One major feature of considerable interest has been the big increase in the diversity and coverage of lichens colonising trees, particularly their twigs and branches. This recolonisation includes many nutrient-rich indicator species and is in part related to the increase in pollution with nitrogen compounds from farming and car exhausts. There are also recent adverse changes in the abundance and diversity of *Cladonia* species and other lichens characteristic of *Calluna*-rich heathland. These changes reflect the fall of SO_2 levels coupled with an increase in the underlying impact of nitrogen pollutants and a corresponding increase in invasive vascular plants.

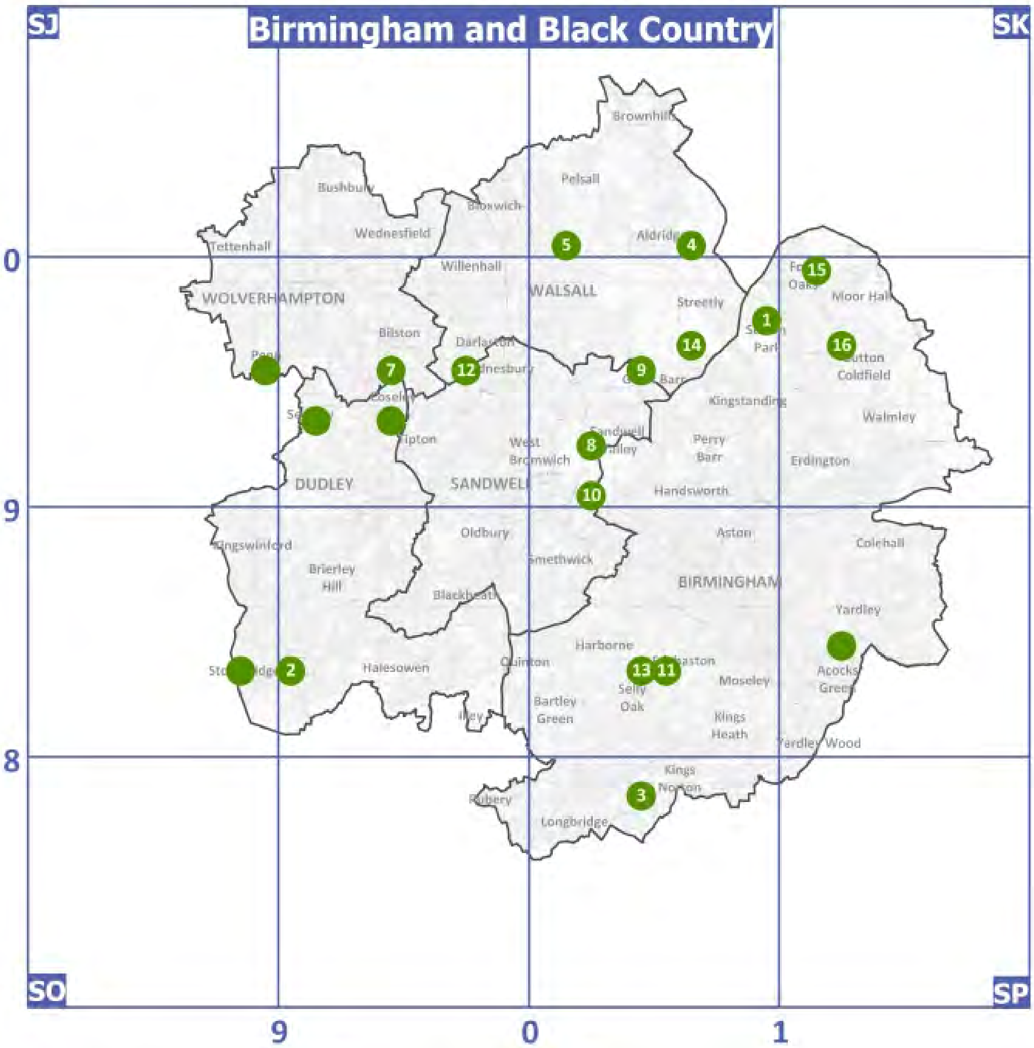
Other features are also currently adversely affecting lichen biodiversity. For example many of the graveyards which represent the most important saxicolous habitats in B&BC appear to be subjected to a periodical mechanical scrubbing of stones, others are extremely poorly maintained and yet others are treated by regular applications of herbicides distributed indiscriminately over lichens and developing scrub vegetation, killing both.

There is a need to encourage more people to study this beautiful group of organisms, to recognise and conserve existing diverse populations, to continue to monitor change and to make more use of their remarkable value as ongoing environmental indicators.

The lichen surveys in B&BC

Because there are currently considerable changes in the lichen biodiversity of B&BC, the present account deals only with records made since 2000, although some earlier records from Sutton Park are mentioned in the species entries. Also, a large number of records were made by D.C. Lindsay and the Wildlife Trust from Birmingham in the 1980s. Their lists suggest that positive responses to falling SO_2 levels had already started in the 1980s. Even some of the SO_2-sensitive foliose and fruticose species such as *Flavoparmelia caperata*, *Tuckermanopsis chlorophylla* (which is now possibly decreasing as a result of lowering levels of bark acidification) and *Usnea subfloridana* were recorded, usually on willow bark and sometimes on fence wood which might have been recently imported into the conurbation. A significantly long list of heathland *Cladonia* species was also recorded, suggesting that their decline is now taking place. Some of the more interesting records have been mentioned in the species entries, but in addition many of the commoner lichens were also recorded then.

The majority of the modern records are derived from 16 recent lichen site or area surveys led by senior members of the British Lichen Society which have been generously contributed to the B&BC Flora project. There are also some notes on some further brief reconnoitres. Each of the sites is described briefly below and the records have been used as the basis of entries for 217 species (plus 4 which are only known from old records). The distribution of the 16 sites surveyed is shown in the following map, plus some un-numbered points for the minor sites.



The principal surveyors were Peter James (PWJ), Ivan Pedley (IP), Mark Powell (MP), Joy Ricketts (JR) and Rose Golding (RG). I.C.Trueman (ICT), Eleanor Cohn (EVJC) and Anne Daly (APD) have also assisted with certain of the surveys. Records collected by D.C. Lindsay and the Wildlife Trust surveyors under his direct control are labelled 'DCL' and dated.

Site Register and general comments on the site lists

In the atlas of lichen species the following sites are given two-letter codes:

1. Sutton Park (SP)

Surveyed 2008-2010 by PWJ & MP on a large number of site visits with occasional field assistance given by M. Butler, J. Lloyd, IP, Prof. C. Smith, other members of the British Lichen Society and ICT.
Central grid reference SP097970, although the site extends to more than 900 ha and includes the whole or parts of 15 monads (km squares). Further location notes are given against many species entries.
156 species recorded.

This is the principal basis of the present B&BC lichen account and has contributed records for over 70% of the entire set of species recorded here, the site being relatively weak only in 'natural' saxicolous habitats. A full discussion of the results will be found in James & Powell (2010). The importance of this site and its long history as a nature reserve has been discussed elsewhere in this book and its function as an oasis for the diversity of lichens in B&BC is very clear.

A lichen list of 27 species was made by PWJ in the woodland and heathland of the Park in 1977 and a checklist of lichens records from Sutton Park was published by Coxhead & Fowkes (1992) listing 40 species, although of these only 26 had recent (post 1985) records. It is therefore certain that there has been a spectacular increase in the number of species present in the Park, particularly in corticolous species, with the exception of the SO_2-tolerant *Lecanora conizaeoides*, abundant in 1977 and rare today. Most of the well-lit branches and twigs in the Park are now colonised, and the now abundant, attractive foliose and fruticose species will be particularly pleasing to the non-specialist and contribute to the already huge aesthetic and scientific value of the natural history of the Park. Particularly interesting is the record for *Usnea flavocardia*, which is considered nationally rare and was previously recorded only from Cornwall, Pembrokeshire and W Scotland. It is also abundantly clear that such changes are by no means complete and are still taking place. With saxicolous species these developments are much more complicated and less extreme, particularly on SO_2-buffered calcareous substrates.

These current modifications in lichen cover are not entirely positive. Firstly, the lists reveal the increased influence of nutrient-indicating species, with high frequencies of *Physcia, Physconia* and *Xanthoria* species particularly on twigs. Secondly, the terricolous lichens belonging to the genera *Baeomyces, Cladonia, Peltigera* and *Placynthiella* which are now generally sparse were apparently less so in the past. These species are associated with bare heathland areas, particularly by paths and after burning, which may themselves be becoming scarcer and less long-lasting, ironically with "better" management involving less human disturbance. It is also possible that increased nitrogen inputs into the soils from the atmosphere are allowing a more rapid recovery of the vascular plant cover from disturbance. James

& Powell (2010) comment that "the most spectacular heathland-type communities are now to be observed with the aid of a ladder, on the rotting conifer-wood shingle roofs of two small kiosks at the Streetly Gate and Four Oaks entrances to the Park"!

2. St Mary's, Old Swinford, Dudley (OS)

Surveyed 19th October 2009 by PWJ, assisted by ICT & APD
Central grid reference: SO907831
54 species recorded.

A very interesting extensive churchyard with many, large, chiefly sandstone, gravestones. Considerable diversity is present as the main rock type has a good and varied lichen community. The abundance of *Melanelixia fuliginosa* is especially interesting. Portions of the outer church wall are heavily shaded, especially near the car park. There is no strong sign of nitrification in the saxicolous flora, but part of the churchyard is immersed in a thicket of herbaceous vegetation with occasional trees (sycamore, birch, oak, ornamental cherry etc.) which generally carry a very limited number of nitrophile species The green algae *Trentepohlia* spp. (orange in colour!) are frequent on trees and gravestones. Also recorded was the fungus *Geastrum schmedelli* (= *G.nanum*).

3. St Nicholas, Kings Norton, Birmingham (KN)

Surveyed 8th September 2009 by PWJ assisted by ICT
Central grid reference: SP049789
52 species recorded

The church wall is very shaded. The churchyard is very extensive with *circa* 800 gravestones. There is early evidence of recovery from intense environmental acidification over many years from industrial Birmingham. Probably a very depleted flora then, now being replaced by nitrophyte species (nitrogen needy or tolerant). Acid gravestones are showing a ± healthy development of crustose species (e.g. *Rhizocarpon reductum, Buellia* species). *Lecanora conizaeoides* is notably absent indicating the widespread disappearance of that species in current surveys and a good indication of the decreased impact of acidification on lichen communities. Also seen in the graveyard was the fungus *Lacrymaria lacrymabunda* - Weeping Widow! N.B. trees numerous, mainly horse chestnut, yew, lime, occasional sycamore and ornamental cherry. The trees are very poor in lichen cover, with only a few nitrophilous species on dead twigs of cherry.

4. Aldridge Parish churchyard (AP)

Surveyed 21st September 2009 by PWJ, assisted by ICT.
37 species recorded

a) main churchyard, central grid reference SK060006,
Gravestones few, some ±cleaned; overgrown with trees (mostly yew) & mostly too shaded. Outer wall of churchyard very poor. Few lichens on trees, chiefly on ornamental cherry.

b) annexe graveyard, central grid reference SK061007 (mainly additional species). More grassy than main churchyard, more open, poorly maintained, ±overgrown with grass. No trees.

5. Coalpool Cemetery, Walsall (CC)

Surveyed 21st September 2009 by PWJ assisted by ICT
Central grid reference: SK018005
35 species recorded

Very large, poorly maintained. *Evernia prunastri, Hypogymnia physodes, H. tubulosa, Melanelixia subaurifera, Parmelia sulcata, Physcia adscendens, P. tenella* and *Punctelia subrudecta* are all seen on a single gravestone beneath a sycamore, demonstrating vividly its nutritional effect on acid substrates beneath its canopy. They were not, or rarely, seen elsewhere in this large cemetery and it was not possible to ascertain whether a similar flora was on branches in the canopy.

6. Public footpath E of Black Swan Inn, Illey, Halesowen (IL)

Surveyed 30th July 2010 by PWJ assisted by ICT.
Grid references: SP9881 and SP9882
29 species recorded

From stile at SP982817 to field N of Illey Hall Farm at SP982821; most species are on twigs, often dead twigs. Continuing into SP9882 examining woodland margin, fields, hedgerows (field maple and dog rose), some willow (mostly dead), hazel, elder (mostly dead or dying).

7. Ladymoor Pool Bilston (LP)

Surveyed 22nd April 2010 by PWJ assisted by ICT + EVJC
Central grid reference: SO942950
19 species recorded

A relatively small heap of large boulders of very solid furnace slag set in an area of marsh and powdery slag was examined.

8. Sandwell Valley Country Park (SV)

Surveyed 19th Dec 2003 by IP & JR.
Central grid reference: SP028926
42 species recorded

Records mostly from SP0292, a few from SP0392.

9. St Margaret's, Great Barr, Birmingham (GB)

Surveyed 19th Dec 2003 by IP
Central grid reference SP049959
37 species recorded

10. Handsworth Cemetery, Birmingham (HC)
Surveyed 19th Dec 2003 by IP
Central grid reference: SP029907
42 species recorded

11. Edgbaston Nature Reserve, Birmingham (ER)
Surveyed 17th Jan 2004 by RG & JR
Central grid reference SP054839
29 species recorded

12. Moorcroft Wood, Moxley (MW)
Surveyed 25th May 2010 by PWJ assisted by ICT.
Central grid reference: SO970951.
33 species recorded

Partly shaded and well-lit furnace slag mounds around and within one of the shallow water pools surveyed, although access difficult. The woodland trees were largely devoid of lichens although some records were made on fallen branches.

13. Birmingham University Campus (BU)
Surveyed 15th September 2009 by IP and OPAL participants.
Central grid reference: SP0483
53 species recorded

All the sites are within the 1km square containing the University station: SP0483. They are: a) along a walk line from the Biosciences building N to the canal then E to the athletics track and return to Biosciences; and b) a second walk (with the OPAL group) S to the trees bordering the ring road of the campus overlooking fields to the S. The sandstone records are from the parapet and 'bioroof' experimental plots on the flat roof of one of the older original buildings. *Usnea* sp. observed on lime bark.

14. **Barr Beacon Summit (BB)**
Surveyed 24th March 2011 by PWJ + ICT and on several subsequent visits in 2011 by PWJ.
82 species recorded

A series of distinct habitats was assessed:
(i) Car park area at *circa* SP06059707: concrete kerbs, roadside stumps and boulders (which have subsequently been removed).
(ii) Scrub and woodland: oak, birch and small area of pine by reservoir.
(iii) Summit War Memorial: mainly granite, smooth and largely maintained and cleaned - thus poor in lichen cover except in a few recesses overlooked during maintenance - mainly at the perimeter of the monument area.
(iv) Hedgerow along summit track between N and S car parks - rowan and hawthorn.

(v) Walls of reservoirs: mixture of mortar, cement, some exposed brickwork, variously shaded and mossy on W side; lichens particularly varied on sheltered E side alongside pathway between N and S car parks.
(vi) *Erica* heathland: two small heathland sites at S end of site at *circa* SP061968. These were created using heather brash from Brownhills Common (SK0406) in 1992 and 1995.

15. Four Oaks area (FO)

Surveyed PWJ in 2010 and 2012
Grid references: range within SP1199
38 species recorded

Mainly records from gardens and roadsides and also including stonework at St. James's Church, Mere Green Road.

16. Holy Trinity Parish Church, Sutton Coldfield (SPC)

Surveyed PWJ in 2012
40 species recorded
Central grid reference: SP121963

Site would benefit from further visits.

Other sites briefly visited by PWJ & ICT in 2009 and 2010:

St Bartholomew's, Penn **(PC)** (SO894952). Lichens recovering; 7 common crustose species observed.
South Yardley Cemetery **(SY)** (SP125844). Huge site, much managed by applications of weedkillers, short list of 10 common crustose species observed.
All Saints Church Sedgley **(SC) (**SO917937). Much sprayed with herbicide; modest list of 12 species mainly on churchyard wall.
Christ Church, Coseley **(CCC) (**SO947933). Two churchyards; both are maintained with herbicide treatment, having few lichens beyond *Lepraria incana* (7 species altogether).
Stourbridge Cemetery **(STC)** (SO886836). Only 12 species observed although a single large saxicolous colony of *Parmelia saxatilis* was noted.
St Michael & all Angels Church Pelsall, Walsall **(PCW)** (SK020030). Possibly sprayed and/or recently cleaned. Only a very few gravestones with a lichen flora, only 23 species recorded, corticolous lichens absent except for *Xanthoria polycarpa* and *Physcia tenella*, most saxicolous species in the list poorly represented and rare.

Some samples of critical specimens from Sutton Park are housed in Herb. Powell, others, from various sites, in Herb. James.

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Peter James examining furnace spoil at Moorcroft Wood; photo Ian Trueman

Species Entries

Entries are presented alphabetically by genus and then by species for all species positively identified in the present survey in B&BC (plus four old records). The taxonomy follows Smith *et al.* (2009), with a few minor updates. Most species are illustrated in Dobson (2011). The entry for each species starts with a brief précis of its morphology, ecology and distribution in UK as described in Smith *et al.* (2009) and Dobson (2005), ending with a figure in brackets showing the maximum zone level of SO_2 air pollution that can be tolerated by the species as estimated in Dobson

(2005) from Hawksworth & Rose (1970), except where there is doubt. A score of 10 indicates "pure" uncontaminated air, and at the other end of the scale a score of 2 records the appearance of the pollution tolerant lichen *Lecanora conizaeoides* on tree bark at winter levels of SO_2 declining to about 150 μg m^{-3}. This scale is not used in Dobson (2011). The remaining remarks record the presence and any other observations about the species at the sixteen main sampled sites, with some further remarks on the other briefly visited sites in B&BC where appropriate.

Acarospora fuscata
Crustose; found on hard, siliceous, nutrient-enriched substrates; common throughout UK (3).
CC on slate.

Acarospora rufescens
Crustose; siliceous substrates.
SP on brick bridge parapet N of Rowton's Well; BB on granite of War Memorial.

Acarospora smaragdula
Crustose; siliceous rocks and in metal-rich situations. Fairly common throughout UK (5).
BU on sandstone.

Acrocordia salweyi
±Immersed, on soft, highly calcareous rocks and old mortar, throughout UK, common in S & W England (5).
BB on mortar, SE side of reservoir.

Agonimia tristicula
Minutely squamulose, on calcareous soils and dunes and on mosses and lichens in crevices of ±calcareous rocks and walls.
BB on shaded mossy mortar on W side of reservoir near roadside.

Amandinea punctata
Crustose; common throughout UK on nutrient-rich or -enriched bark, wood and stone (3).
SP frequent on twigs and young bark of oak and other species, on smooth older bark of mature tree trunks and on weathered sawn wood of posts and benches; IL on hawthorn, and wood of a stile; SV on trees in Swan Pool car park and on alders and willows by Swan Pool; ER on a wooden bench; BU on ash bark; BB on hedgerow rowan.

Arthonia lapidicola
Crustose, often partly immersed; calcareous rocks, stones and mortar; frequent in UK (5).
SP on iron-stained concrete blocks E of Wyndley Leisure Centre; FO, well developed in metal-enriched run-off of windows, St James's Church.

Arthonia punctiformis
Immersed in the smooth bark of many tree species (4).
SP on hawthorn twigs, N of Longmoor Pool.

Arthonia radiata
Immersed in the smooth bark of many tree species; widespread and common in UK except in air-polluted areas (7).
SP, on oak twigs S of Streetly Gate; IL on young oak and hazel bark; BU on ash bark; BB on oak on W-facing slope.

Arthonia spadicea
Immersed in very shaded basic bark of tree trunks throughout UK (5).
IL in deep shade on smooth bark of oaks.

Arthopyrenia punctiformis
Immersed in smooth bark of twigs and young trees of many species; common in UK except in highly polluted areas (5).
SP on young hawthorn bark, S of Longmoor Pool; IL on young oak bark.

Aspicilia contorta
Crustose; common in UK on hard calcareous rocks, concrete and mortar, tolerant of nutrient-enrichment (4).
SV on concrete kerbs.
subsp. ***contorta***
SP from a concrete dam E of Keeper's Pool and a brick wall E of Wyndley Pool; BB on SE side of reservoir walls.
subsp. ***hoffmanniana***
SP with subsp. *contorta*; KN, a single thallus; OS a single specimen on calcareous surround of a grave; BU on concrete.

Bacidia adastra
Crustose; usually corticolous; typical of the nutrient-enriched zones at the base of trees in parks.
SP, base of a birch tree near Toby Carvery; FO on *Magnolia*.

Bacidia inundata
Crustose; usually on hard siliceous rock in non-polluted water (6).
SP on shaded rock at overflow structure at E end of Powell's Pool.

Bacidia neosquamulosa
Crustose; sheltered saxicolous and corticolous, ±nutrient-rich sites in urban situations.
FO on rockery stones.

Bacidia saxenii
Crustose; a common pioneer of a wide range of calcareous or dust-enriched substrates.
SP on treated fence posts, Gum Slade.

Bacidia sulphurella
Crustose, corticolous, typically on tree bases; tolerant of urban conditions in UK.
SP on a shaded oak trunk SE of Streetly Gate.

Bacidia viridifarinosa
Crustose, on shaded, dry bark of mature deciduous trees and on siliceous or slightly basic rock-faces, old memorials, frequent.
SP on sheltered side of boles of old oaks, Gum Slade.

Baeomyces rufus
Crustose or minutely squamulose; typically on damp gravelly or peaty acid soils, common in UK (4).
SP on sparsely-vegetated soil beside a path W of Keeper's Pool and on a wooden shingle roof at Streetly Gate; MW on furnace slag; BB.


Baeomyces rufus, Barr Beacon (×4); photo Gemma Edwarrds

Belonia nidarosiensis
A powdery crust; on dry, rain-sheltered calcareous rocks and church walls; not uncommon throughout UK (5).
SP on shaded limestone of overflow structure E end of Powell's Pool.

Bilimbia sabuletorum
Crustose; growing typically on mosses on calcareous rocks or walls; common in UK (4).
SP on mosses on old mortar on wall by Four Oaks entrance; amongst mosses on mortar on church wall OS; ER on brick walling and mortar; CC on ±basic mortar and also on a tree bone with *Lecidella stigmatea*; GB; BB on shaded mosses on mortar/cement on W side of reservoir walls; SPC.

Buellia aethalea
Crustose, frequent in UK on siliceous rocks, sometimes in nutrient-rich situations and a pioneer on walls and memorials (5).
SP on brick wall at E end of Powell's Pool and sandstone coping stones of parapets of bridges over the railway; OS occasional on hard acid rock substrates; KN widespread on granite with *Rhizocarpon reductum*; AP main churchyard; CC widespread on granite; LP scattered thalli on furnace slag; GB; BU on sandstone; BB on granite War Memorial; SPC; STC; PCW.

Buellia badia
Crustose, subsquamulose to squamulose; siliceous rocks, especially roof tiles; uncommon in UK.
SP on horizontal coping stones of small bridge parapet approx. 100 m W of Town Gate.

Buellia griseovirens
Crustose; common in UK on ± smooth bark (5).
Occasional in SP on smooth bark of *Acer*, on old bark of mature oak and on a wooden noticeboard, Bracebridge; FO on ancient oaks and apple and pear trees.

Buellia ocellata
Crustose; exposed siliceous rocks, pebbles and stonework throughout UK (5).
CC and KN in granite communities with *B. aethalea*; PCW.

Caloplaca arcis
Crustose, minutely lobate at the margin; common on limestone and cement in churchyards and lowland walls throughout Britain.
SP on concrete beside Bracebridge Pool and on brick wall at E end of Wyndley Pool; occasional at KN on limestone gravestones and associated mortar; BU on concrete; BB reservoir walls, cement; SPC.

Caloplaca cerinella
Crustose; in communities on nutrient-rich bark, especially of twigs; scarce or under-recorded (6).
Occasional in SP on elder twigs; IL on moribund elder.

Caloplaca cerinelloides
Crustose; base-rich bark; rare in UK or overlooked.
SP on mature trunk of ?*Populus* to S of Wyndley Leisure centre.

Caloplaca chlorina
Crustose; damp or shaded siliceous rocks; throughout lowlands (6).
SP on sandstone coping-stone of bridge parapet approx. 100m W of Town Gate.

Caloplaca citrina
Crustose; very common in UK; mainly on manured or calcareous substrates (3).
In B&BC recorded at most sites as frequent on basic saxicolous substrates including calcareous gravestones, concrete, mortar and furnace slag. In SP occasional on mortar, and on one occasion on a birch trunk in a wound track. Currently regarded as a complex of species.

Caloplaca crenulatella
Crustose; typically on flat concrete; frequent throughout lowland England & Wales especially in urban areas (4).
Occasional in SP, on concrete beside Longmoor & Keeper's Pools and on a brick wall by Wyndley Pool; OS well developed on a horizontal cement gravestone; KN ±frequent on flat, ±base-rich substrates; SV on concrete kerbs; HC; FO, on a concrete patio; SPC.

Caloplaca dichroa
Crustose, on limestone rocks, walls; locally abundant in UK.
FO, garden walls.

Caloplaca flavescens
Crustose with a radiating, lobed margin; common throughout the British Isles on calcareous stone but absent from some air-polluted areas (4).
OS well developed on a single limestone tablet (back of a seat); KP a single thallus, side of limestone chest tomb; AP annexe; single specimen; BU on concrete; BB on cement of W side of reservoir walls, scattered.


Caloplaca flavescens, Old Swinford; left (x1); right with apothecia (x3); photos Ian Trueman

Caloplaca flavocitrina
Crustose; calcareous rocks and base-rich bark; common throughout UK (4).
SP occasional, usually on brickwork including mortar, also on large limestone rocks at overflow of Powell's Pool; OS frequent, especially on walls; KN frequent on basic saxicolous substrates; SV on concrete kerbs; AP; GB; BU on concrete; BB on cement of reservoir walls, throughout; FO on a concrete patio; SPC; PCW.

Caloplaca holocarpa (aggr.)
Crustose; a pioneer species on calcareous stone, mortar, asbestos cement, rarely on bark; very common throughout the British Isles (2).
SP on concrete by Keeper's Pool and on brick wall by Wyndley Pool; occasional at most other sites on basic stones, mortar and concrete kerbs; on furnace slag at LP and on elder twigs at ER; at BU on sandstone. Now regarded as a complex of species. The segregate ***Caloplaca oasis*** is recorded at BU on concrete, at BB as a single colony on W side of concrete reservoir walls and at FO, on mortar in walls.

Caloplaca obscurella
Crustose; typically on nutrient-enriched basic bark; common throughout UK.
SP on damp branch, and mature willow trunk, S of Wyndley Leisure Centre.

Caloplaca saxicola
Placodioid; calcareous rocks throughout UK (6).
Recently recorded from SP by PWJ, there are 2 records from 1980s on walls (SP0279, SP0981) by DCL.

Caloplaca teicholyta
Crustose, obscurely placodioid, common on calcareous stone and mortar (4).
FO, sterile on outhouse roof (mock asbestos).

Candelaria concolor
Minutely foliose or fruticose; mostly on nutrient-rich bark of well-lit wayside trees; local but spreading throughout the British Isles (7).
SP on sycamore trunk near Blackroot Bistro.

Candelariella aurella
Crustose, mostly on man-made basic substrates; throughout the British Isles, commoner in urban habitats (2).
(Usually sheltered) basic stones, mortar, church walls, often occasional to frequent: SP, OS, KN, AP, CC, ER, BB, SPC and f. ***aurella*** at GB, HC & BU on concrete.

Candelariella reflexa
Crustose, with or without minute squamules; on shaded nutrient-enriched bark; common throughout British Isles and spreading (4).
SP abundant on nutrient-enriched twigs, branches and tree bases; IL at base of moribund Oak; SV on willows and young oak; MW on tree base; BU on sycamore bark.

Candelariella vitellina
Crustose, subsquamulose; very common in UK on nutrient-enriched siliceous and calcareous rock except in heavily polluted urban areas (3).
Occasional in SP on sandstone blocks in walls, and on one instance on a birch trunk in a wound track; frequent at OS on basic gravestones, also church wall pebbles; frequent at KN on sheltered ±base-rich rock and mortar surfaces; AP main churchyard; generally abundant at CC on ±basic stones and mortar; ER on brick walling and mortar, frequent and often fertile at LP on furnace slag; CCC; SPC; recorded as f. ***vitellina*** at HC, GB and BU (on sandstone); SC; STC; PCW.

Candelariella xanthostigma
Crustose; widely distributed but local in UK on less-shaded trees, and typically not in nutrient-enriched situations.
SV on willows and young oak; GB.

Carbonea vitellinaria
Thallus inapparent, inhabiting *Candelariella vitellina* on weakly nutrient-enriched acid rocks, widespread.
Recorded by DCL in 1981 on concrete wall (SP0277).

Catillaria chalybeia
Thinly crustose; common in UK, mainly on slightly base-rich or nutrient-enriched siliceous rocks (3).
Rare in SP on sandstone blocks in walls, and on one instance on a birch trunk in a wound track; KN and CC, on acid gravestones; BB on War Memorial; PCW; GB and BU as var. ***chalybeia***.

Catillaria lenticularis
Thinly crustose; widespread on limestone and highly calcareous building materials.
BU on concrete; BB on cement, W side of reservoir.

Cetraria aculeata
Thallus forming shrubby tufts of brown, spinulose lobes. Common in heathland (4).
BB in small quantity in *Calluna/Erica* heath. There is a 1971 DCL record from Sutton Park, last seen 1988 (Coxhead & Fowkes 1992).

Chaenotheca ferruginea
Crustose, common in UK and tolerant of SO_2 pollution, in dry recesses on acid bark (4).
Occasional in SP on dry shaded bark of mature tree trunks, mainly oak, in old woodland.

Chrysothrix flavovirens
Leprose; frequent and increasing in the UK on well-lit, rather dry, non-nutrient-enriched wood and bark of mature broad-leaved and coniferous trees.
Rare in SP on mature oak trunks; OS in lenticels on birch trunk and on rowan.

Cladonia chlorophaea
Podetia to 3cm tall, each with a ± regular terminal cup, surface ± granular-sorediate. Common throughout UK on peat, rotting logs and among rocks especially in heathland (4).
Occasional in SP on decaying stumps, mature bark and sandy soil; occasional at OS on summits of gravestones; SV on the moss *Hypnum cupressiforme* on willows and young oak, ER in gardens on lignin; MW on furnace spoil; GB; BU; PC; SC. At BB the two chemical races ***Cladonia cryptochlorophaea*** and ***C. merochlorophaea*** were distinguished. DCL recorded the chemical race ***C. novochlorophaea*** on moss on a wall in SP0891 in 1979.

Cladonia chlorophaea (×8) (del. Gemma Edwards)

Cladonia coniocraea (aggr.)
Podetia grey-green, to 2cm tall, shortly corticate-squamulose at the base, finely sorediate above, apices pointed or rarely with very narrow cups. Common throughout UK on bases of living or recently dead trees and wood and sometimes on heathy soil (3).
Rare in SP on rotting stumps including at the Gum Slade and on shaded wall S of Keeper's Pool; occasional at OS on summits and sides of gravestones; rare at KN on a tree base; ER on a stump; AP annexe,on a mossy path; BB on War Memorial and in the heath; SY.

Cladonia digitata
Basal squamules usually dominant, densely sorediate and partly orange below; podetia to 1cm tall, pointed or with irregular cups; apothecia rare, red. Throughout UK on rotting wood or peaty soil (6).
One sample only at OS on rotting wood. It was also recorded by DCL at Moseley Bog (SP0981, SP0982) in 1979 and 1981.

Cladonia diversa (*C. coccifera* aggr.)
Thallus yellow-green, podetia 1-2cm tall, with ±regular cups, surface granulose, occasionally with red apothecia on their rims. Widespread and common in UK on heathland soil (6).
Rare at SP, terricolous on Little Bracebridge Heath; BB in the *Calluna/Erica* heath. Also recorded by DCL in heathland at Rednal Hill (SO9976) in 1971.

Cladonia fimbriata
Podetia to 1.5cm tall, with ±regular terminal cups, entirely powdery-sorediate. Common in UK on rotting wood and earth, even in polluted areas (3).
Rare at SP, terricolous on Little Bracebridge Heath; FO, rare on rockery stones in gardens.

Cladonia floerkeana
Podetia to 2cm tall, grey, ± covered with squamules; cups absent, apices frequently with distinctive clusters of red apothecia. Very common in UK on heathland and, more rarely, rotting wood (5).
Rare at SP on a shingle roof at Streetly Gate entrance and on heathland SE of Bracebridge Pool; BB in open patches in the *Calluna/Erica* heath.


Cladonia floerkeana (x12) (del. Gemma Edwards)

Cladonia furcata
Basal squamulose thallus usually absent, podetia to 2.5cm tall, ± tufted, branched, bearing scattered squamules, all apices pointed. Common in the UK in heathland and on other acid soils, with an ecotype (**subsp**. ***subrangiformis***) in open turf on calcareous soils (4).
Occasional at SP in heathland SE of Bracebridge Pool; MW on furnace spoil; BB in open patches in the *Calluna/Erica* heath. DCL had many records for this species in our part of VC 37 in the 1980s.

Cladonia glauca
Podetia to 5cm tall, squamulose at the base, finely sorediate above, simple or antler-shaped towards the apices. Widespread particularly in Scotland and E England on rotting wood and on heathland.
SP from a shingle roof, Four Oaks entrance; BB in open patches in the *Calluna/Erica* heath.

Cladonia humilis
Podetia to 1cm tall, mostly regularly cup-shaped and entirely finely sorediate. Basal squamules often well-developed. Common throughout UK on dry or sandy, especially recently disturbed soil including suburban gardens (3).
Rare at SP, terricolous and at the base of a mature oak outside Streetly Gate; OS well developed on several gravestones; AP main churchyard; MW on furnace spoil; BB on War Memorial; FO, common in neglected gardens on rockery stones; SPC; STC.

Cladonia macilenta
Thallus blue-grey, podetia to 2cm tall, simple or becoming branched towards the apices, cups absent, apothecia rare, red. Throughout UK on soil, bark and wood in acid woodlands and heathlands (5).
SP on rotting stump, terricolous on Little Bracebridge Heath and shingle roof, Town Gate entrance; BB in the *Calluna/Erica* heath.

Cladonia ochrochlora
Podetia to 4cm tall, simple, mostly with a terminal cup, corticated-squamulose at the base, in part corticated and sorediate above. Common on rotting tree stumps and less often in heathland; throughout UK (6).
SP on humus-rich soil of bank of NE end of Blackroot railway bridge; BB in the *Calluna/Erica* heath.

Cladonia parasitica
Thallus of very small, compacted squamules; podetia to 1cm tall, scattered, contorted-branched. Rather local throughout UK on decaying, decorticated wood especially of oak, also on earth banks, in old woodland (6).
SP on lignum of dead oak trunk in the Gum Slade.

Cladonia pocillum
Basal squamules well developed, sometimes dominant; podetia to 1.5cm tall, with regular cups with a coarsely granular surface. Calcicole species, common throughout UK mainly on sandy calcareous soils and old mortar (4).
MW on furnace slag; BB on concrete, W side of reservoir.

Cladonia polydactyla
Podetia to 2cm tall, sometimes branched at the apex, with or without cups, lower part squamulose, becoming finely sorediate above; apothecia red. Throughout UK on rotting wood and soil in woodland and heathland (5).
SP at base of birch trunk and on rotting wood at edge of Bracebridge Pool. DCL recorded it on rubble at a derelict brickworks in SP0983 in 1986.

Cladonia portentosa
Squamules never present, podetia 4-8cm tall, very richly branched forming rounded, compact, complex clusters. Abundant in heathlands throughout UK.
BB in the *Calluna/Erica* heath. DCL recorded it from rubble at a derelict brickworks (SP0983, 1986).

Cladonia pyxidata
Thallus grey-green, podetia to 1.5cm tall, cups widely expanded with a coarsely granular surface. Very common throughout UK on mossy rocks and walls, tree trunks, and fairly dry acid soils (4).
CC amongst mosses within grave surrounds; AP annexe graveyard; KN on a single acid gravestone; OS occasional on summits and sides of gravestones; BB in the *Calluna/Erica* heath.


Cladonia pyxidata, Old Swinford (×3); photo Ian Trueman

Cladonia squamosa* var. *squamosa
Basal squamules densely matted; podetia to 4cm tall, ± pointed or with deformed, ± perforated, cups. Common on acid soil, peat and rotting wood in UK (6).
BB in the *Calluna/Erica* heath. In 1986 DCL recorded it on soil over brick rubble, derelict brickworks (SP0983).

Cladonia subulata
Podedia to 5cm tall; entirely farinose-sorediate, apices pointed or with an antler-shaped, narrow, ill-defined cup. Frequent on dry, sandy heaths in UK (6).
BB in the *Calluna/Erica* heath; DCL recorded it on mossy soil, derelict brickworks (SP0983, 1986).

Clauzadea monticola
Crustose, often immersed in hard calcareous rocks; widespread throughout UK (4).
SP on mortar of wall beside Keeper's Pool; OS occasional on ±calcareous gravestones and similar substrates; KN; AP annexe; BB, mortar, scattered throughout reservoir walls.

Cliostomum griffithii
Crustose; usually on the dry side of mature trees including conifers, also on wood and walls; abundant throughout UK even in moderately polluted areas (3).
SP on young oak, Little Bracebridge Heath.

Collema crispum
Foliose, gelatinous when wet; throughout UK on calcareous rocks and walls and especially old crumbling mortar (4).
OS as a single sample on mortar of church wall.

Collema tenax
Foliose, gelatinous and greatly swollen when wet; common in UK and abundant on base-rich clay, sandy and calcareous soils and mortar (4).
SP in basic sandy soil of old gravel pits, E of Keeper's Pool; SPC, fertile between paving stones of ornamental garden.

Cyrtidula quercus
Immersed in bark of young oak and hazel twigs; common throughout UK (5).
Occasional at SP on smooth bark of oak twigs; IL on young oak bark; OS.

Dimerella pineti
Crustose; common in UK on shaded fairly acid bark especially at tree bases or in crevices or in other habitats (4).
Frequent at SP on shaded bark, especially bases of oak trunks; MW on furnace spoil; FO on bark of old pear tree.

Diploicia canescens
Crustose, placodioid, on dry rocks and dry bark in nutrient-rich or calcareous habitats (3).
FO on roadside wall.

Diploschistes scruposus
Crustose; widespread throughout UK on siliceous or slightly basic, often nutrient-enriched rocks and walls (5).
ER on sandstone walls in the gardens; MW on furnace spoil; BB on cement, W side of reservoir walls; FO on cement-brick wall.

Diplotomma alboatrum
Crustose, calcareous rocks and mortar, frequent in UK (5).
BB, cement, W side of reservoir walls.

Evernia prunastri (L.) Ach.
Foliose, but attached at one point and appearing fruticose; common in UK, especially on well-lit trunks of deciduous trees (5).
Occasional at SP, corticolous; SV on trees in the Swan Pool car park and Alders and Willows fringing Swan Pool; ER on Elder twigs and Oak branches; CC a single specimen on gravestone below a large Sycamore; HC; GB; BU on Sycamore bark; BB on oak branches, W-facing slope. DCL recorded it on Willow bark at 5 sites in our part of vc. 37 between 1979 and 1985.


Evernia prunastri, Barr Beacon (×2); photo Gemma Edwards

Fellhanera bouteillei
Crustose; infrequent throughout UK on twigs and leaves of evergreen trees.
Rare at SP on holly leaves near Bracebridge Pool.

Fellhanera viridisorediata
Crustose; throughout UK, found especially on the bases of native and exotic trees in parks in cities and in many other urban biotopes.
Occasional at SP, most occurrences near the base of birch trunks; these trunks were probably visited by urinating dogs; MW on furnace spoil.

Flavoparmelia caperata
Foliose; common in S and W UK mainly on acid-barked broad-leaved trees and now colonising N and E with falling levels of SO_2 (6).
Now occasional in SP, corticolous; IL high branch of wayside Oak; SV wooden railings; HC; GB; BB on Oak branches, W-facing slopes; FO on bases of old Beech and Lime trees. DCL recorded it in 1985 on Oak bark at Cadbury College, Kings Norton (SP0478).


Flavoparmelia caperata (×2); photo Ian Trueman

Flavoparmelia soredians
Foliose; similar to *F. caperata* and in similar habitats; originally restricted to coastal habitats in UK, now spreading inland and becoming locally common (5).
SP on oak branch SE of Streetly Gate; FO, a single specimen on base of an old sycamore and also recorded on oak, Moor Hall Estate.

Fuscidea cyathoides
Crustose; very common on coarse-grained siliceous rocks in upland UK.
OS, a single specimen on granite surround of a grave.

Fuscidea lightfootii
Crustose; frequent on ±horizontal boughs and twigs, particularly ash and willow, usually in damp areas; frequent especially in W UK (7).
Occasional at SP, often in boggy areas, most commonly on willow; IL on willow and moribund elder; ER on a young oak branch.

Hypocenomyce scalaris
Squamulose; common in UK on acid bark, fences and burnt wood, also occasionally on siliceous rock (4).
Rare at SP, on base of ancient oak trunk W of Town Gate, also on wood near Four Oaks gate where it was also recorded in 1977; KN single colony on acid stone (poor condition).

Hypogymnia physodes
Foliose; very common throughout UK on trees, siliceous rocks and other acid substrates, absent only when mean SO_2 levels exceed 100 $\mu g\ m^{-3}$ (4).
Frequent at SP, corticolous; IL scattered on older tree branches; SV wooden railings and trees in the Swan Pool car park; CC single record on gravestone beneath sycamore; BU on sycamore bark; HC; SPC. It was also quite common much earlier: DLC gives 13 records in our part of VC 37, 1979-86.

Hypogymnia tubulosa
Foliose; common throughout UK in situations similar to those for *Hypogymnia physodes,* and often with it, but rarely as frequent, although it is now increasing, especially on roof tops and other elevated situations (5).
Frequent at SP, corticolous; ER in canopy litter in main car park; IL scattered on older tree branches; AP main churchyard; CC; HC; BU on sycamore bark; SPC; FO on roof tops, often detatched as the result of storms. DCL recorded it on willow bark in 1980 (SP0982).

Hypotrachyna revoluta
Foliose; common in UK on wayside and woodland trees and shrubs, less common on weakly acid rocks and walls (7).
Occasional at SP, corticolous; IL on oak.

Jamesiella anastomosans
Crustose; increasing in UK, mostly on smooth, shaded bark, pollution tolerant (5).
Frequent at SP, corticolous and on rotting lignum of tree stump.

Lecania cyrtella
Crustose; frequent in UK, mainly on nutrient-rich or enriched bark (6).
Occasional at SP on elder twigs.

Lecania erysibe (aggr.)
Crustose; common in UK on nutrient-enriched brick, damp base-rich rocks, asbestos cement and other, often urban habitats (3).
Rare at SP, saxicolous, on brick walls; frequent and very variable at OS on gravestones and mortar of church wall; rare - possibly overlooked - at KN, material in ±sorediate form; MW on furnace slag; HC; BU on concrete; BB widespread and variable on reservoir walls; SPC; PCW.

Lecania naegelii
Crustose; on nutrient-rich bark and twigs of trees and shrubs; common in areas not polluted with SO_2.
Rare in SP on shaded elder bark, W of Longmoor Pool.

Lecania rabenhorstii
Crustose; throughout UK on base-rich rocks.
BU on concrete.

Lecanora albescens
Crustose; very common in UK on hard calcareous rocks, mortar, concrete, walls etc. (5).
In SP occasional on mortar; frequent, especially on mortar of walls; OS; widespread at KN on ±base-rich substrates; common at CC on calcareous substrates; IL on concrete of wall; ER brick walling and mortar; GB; AP Annexe; occasional at LP, with semi-lobed margins, on furnace slag; BU on concrete; BB widespread and common on reservoir walls; FO, ± dominant with *Lecidella scabra* on many roadside mortar-stone walls; SPC; PC; SC; STC; PCW.

Lecanora campestris
Crustose; widespread and very common in UK on mortar, asbestos cement, asphalt paths, mildly basic and nutrient-enriched siliceous rocks and walls and rarely on worked wood (2).
Occasional in SP on concrete; frequent at OS on gravestones and surrounds; scattered at KN on ±basic substrates of gravestones; SV on trees in the Swan Pool car park; AP on both plots; three records at CC on ±basic substrates; furnace slag at LP and MW; HC; BU on concrete; BB on War Memorial and reservoir walls; SPC.

Lecanora carpinea
Crustose; on smooth bark of deciduous trees, exceptionally on stonework; throughout UK (7).
Rare in SP, on ash just N of Powell's Pool and NW of Upper Nut Hurst; OS on young sycamore; SV on alders and willows fringing Swan Pool.

Lecanora chlarotera (aggr.)
Crustose; on bark and wood of deciduous trees and occasionally on worked timber, very common in unpolluted areas of UK (5).
Occasional at SP, corticolous; OS on young sycamore; KN a single thallus on smooth bark of cherry; SV on trees in the Swan Pool car park and on alders and willows fringing Swan Pool; IL on oak branches and twigs, and on dog rose; HC; BU on sycamore bark; BB on oak branches and twigs on W-facing slopes and on hedgerow rowan.


Lecanora chlarotera, Penn (x4); photo Ian Trueman

Lecanora compallens
Crustose; on trunks of wayside and parkland trees, also on timber, probably widespread in UK.
Rare in SP, on *Acer* near Toby Carvery.

Lecanora confusa
Crustose; on bark, particularly twigs, also on wood and worked timber; locally abundant in UK in unpolluted areas, especially near the coast (8).
Rare in SP, on young sweet chestnut trunk, N of Wyndley Pool; FO on roadside and house palings.

Lecanora conizaeoides
Crustose; on a wide range of acidic substrates including bark, wood, siliceous rock, walls, soil, rubberised material, etc. Once the commonest corticolous British lichen in very SO_2-polluted areas (2), it is now becoming much more restricted in UK.
Rare in SP on birch bark and sawn conifer cladding of outbuilding N of Powell's Pool; SV, wooden railings; AP on trees and gravestones in the main churchyard; HC; GB; BU on sandstone; SPC.

Lecanora crenulata
Immersed in hard calcareous rocks, walls and mortar, scattered in UK, commonest in SE and E England (5).
BB on ±consolidated cement, W side of reservoir walls.

Lecanora dispersa (aggr.)
Immersed or a granular crust; on a wide range of natural and human-made calcareous substrates; common throughout UK especially in the lowlands (1).
Occasional in SP, saxicolous (mainly concrete) and a feature of highly eutrophicated tree bases visited by dogs; KN scattered on ±basic substrates of gravestones; SV concrete kerbs; CC common and widespread on ±basic substrates; GB; HC; frequent at LP, on furnace slag with very variable development of thalli; BU on concrete; BB on reservoir walls; SC; SPC; PCW.

Lecanora expallens
Crustose; on well-lit or dry bark, wood and worked timber, occasionally on dry vertical rocks, siliceous memorials, walls etc.; very common in UK (2).
Occasional at SP, corticolous; OS on cherry; KN well-developed on a single acid gravestone; SV on trees in the Swan Pool car park; HC; BU on sycamore bark; BB on roadside wooden stumps in car park area; SPC.

Lecanora farinaria
Crustose; on wood and on bark of shrubs and trees; rare with a scattered distribution.
Rare at SP on weathered plank of wooded roof near Town Gate.

Lecanora gangaleoides
Crustose; common in UK on hard siliceous rocks, especially near the sea and absent from large parts of central and SE England (6).
AP annexe, single specimen.

Lecanora hagenii (aggr.)
Crustose or immersed; a member of the *Lecanora dispersa* group. Common in UK on all substrates, especially on neutral bark, distinctly nitrophyllous.
Occasional at SP on elder and willow twigs; OS on ± calcareous surfaces; frequent at KN on ± basic gravestones; scattered records throughout at CC on ± calcareous substrates; LP, two specimens in intermittent rain tracks on furnace slag; SY; SPC; PCW.

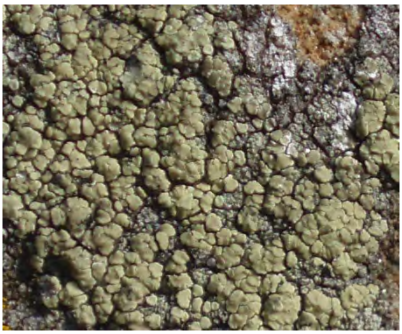
Lecanora jamesii
Crustose; on smooth bark near the bases of deciduous trees (most frequently willow) growing in damp situations; frequent in W and SW, recently recorded in C and E England and in Scotland (8).
Rare in SP at base of a tree near Four Oaks gate; BB on roadside wooden stumps in car park area.

Lecanora muralis
Crustose, lobate at the margin; pollution-resistant and very common on human-made substrates in urban areas (concrete, asbestos cement, asphalt, paving slabs etc.), less so in the uplands where it occurs on nutrient-enriched bird perches (2).
Occasional in SP on concrete and walls, often much damaged by browsing molluscs; also present at all other sites, sometimes scarce, sometimes, as at SPC, in ornamental garden, forming almost continuous coverage of paving.

Lecanora orosthea
Crustose; in recesses and below overhangs on dry, siliceous rocks, old walls, occasionally on wood or bark; common in UK (6).
Frequent, but often scrappily developed on furnace slag at LP and MW; on gravestones at SY; BB on War Memorial.

Lecanora persimilis
Crustose; a member of the *Lecanora dispersa* group, apparently common in UK on twigs and small branches of trees and shrubs with neutral bark.
SV, alders and willows fringing Swan Pool; HC.

Lecanora polytropa
Immersed or scattered granules; common throughout UK on siliceous rocks and walls, also on worked timber (5).
Rare at SP: on sandstone of wall beside Keeper's Pool and parapet of bridge over railway, also on wooden seating near Town Gate; frequent at OS on acid stones; rare at KN on acid gravestone surrounds; CC on a few acid gravestones and surrounds; LP, a single well-fertile thallus on furnace slag; HC; AP Annexe; BU on sandstone; BB on roadside wooden stumps in car park area and on War Memorial; FO on boulders in gardens; PC; SY; SC; SPC; CCC; STC; PCW.


Lecanora polytropa, Old Swinford (×5); photo Ian Trueman

Lecanora pulicaris
Crustose; on decorticated wood, worked timber and bark of both broad-leaved and coniferous trees; widely distributed in UK but commonest in NE England and Scotland (8).
Rare in SP on oak twig SE of Bracebridge Pool; IL, wood of a stile; FO on old palings.

Lecanora semipallida
Immersed; a member of the *Lecanora dispersa* group and only recently distinguished, thought to be common and widespread in UK on calcareous rocks especially hard limestone.
Rare at SP, on concrete structures including wall along SE side of Longmoor Pool; CC; AP annexe; BU on concrete; BB frequent patches on W side of reservoir walls.

Lecanora soralifera
Crustose; on siliceous rocks and walls, often in exposed situations, also on wood and worked timber; widely distributed in UK but local; moderately air-pollution tolerant (5).
OS, Two specimens seen on upright gravestones; CC, on siliceous boulder in grave surround; BB on War Memorial; FO on acid stones in walls and top of front wall at St James's Church.

Lecanora sulphurea
Crustose; exposed, somewhat nutrient-rich siliceous rocks and walls; common and widespread in UK (5).
KN, a single thallus on acid gravestone; MP on furnace slag; also recorded on walls (especially those made of furnace slag) at SC; PC.

Lecanora symmicta
Crustose; on acid-barked trees, as a pioneer on twigs, on wood and worked timber; widespread and common in UK (7).
Occasional in SP, on twigs, especially oak, also on wooden seating; occasional at KN; SV on trees in the Swan Pool car park; IL on smooth bark of oak; BU on ash bark.

Lecanora varia
Crustose, usually of scattered rounded granules; mostly on wood and worked timber; locally frequent, predominantly in E England and Scotland (7).
Rare in SP, on weathered wooden fence near Town Gate; FO on house front palings.

Lecidea fuscoatra
Crustose; on rather smooth, often slightly nutrient-rich siliceous rocks; common throughout UK (5).
Rare in SP, on siliceous material within concrete structure near Little Bracebridge Pool.

Lecidea grisella
Crustose; in similar habitats and often with *Lecidea fuscoatra,* and even more widespread and common in UK.
SP on brick wall at E end of Powell's Pool and beside Wyndley Pool; KN, a single record on surround of gravestone; AP, on sandstone sills beneath four church windows covered with galvanised (zinc-coated) mesh, conf. B. Coppins; BB on War Memorial; FO at St James's Church below windows on S side.

Lecidea grisella, Aldridge Parish Church (×5); photo Ian Trueman

Lecidea lapicida
Crustose; on siliceous, often iron-rich rocks; common in N and W of UK.
Occasional at OS on acid gravestones and surrounds; KN a single record on surround of gravestone, thallus partially rust-red; AP; SY; BB on War Memorial and adjacent sandstone steps.

Lecidea lithophila
Crustose; on exposed siliceous rocks, stones and pebbles, often ones rich in iron; common (5).
BB on War Memorial and sandstone steps; MW on furnace slag; SY.

Lecidella carpathica
Crustose, apothecia resembling those of *L. stigmatea* but red-brown, not colourless, internally. Throughout UK; uncommon, probably overlooked, on weakly basic, nutrient-enriched, rocks, walls, slate, asbestos cement, worked timber.
SPC, on wall of S aisle of church.

Lecidella elaeochroma* f. *elaeochroma
Crustose; on well-lit smooth-barked twigs and small branches, and wood; very common and increasing in UK, moderately tolerant of air pollution (6).
Occasional at SP, corticolous; SV on alders and willows fringing Swan Pool; IL on twigs of oak and dead crack willow; ER on elder twigs and a wooden bench; BU on ash bark; SPC.
Also **f. *soralifera*** (Erichsen) D. Hawksw.
Less frequent, on similar habitats to f. *elaeochroma*. FO on sycamore at edge of garden.

Lecidella scabra
Crustose; on siliceous and slightly base-rich rocks, often on walls and memorials, less often on dust-impregnated wood, worked timber or bark; common throughout UK.
Occasional at SP on sandstone of mortared walls; frequent at OS on ±calcareous substrates; widespread at KN on ±calcareous substrates; occasional at CC on basic surfaces; MW on furnace slag; GB; HC; AP; BU on sandstone; BB on War Memorial and frequent on reservoir walls; FO common on roadside mortar-stone walls; SY; SPC.

Lecidella stigmatea
Crustose; on weakly calcareous and base-enriched siliceous rocks, cement and mortar; very common throughout UK (3).
Occasional at SP on calcareous and base-enriched rocks, cement and concrete; frequent at OS and KN on similar habitats; SV on concrete kerbs; occasional at CC on basic surfaces (also on tree bone with *Bilimbia sabuletorum*); GB; HC; AP; BU on concrete; BB frequent on reservoir walls; FO, abundant on cement and patio slabs; PC; SY; SPC; PCW.

Lepraria incana
Leprose; on acid rock, walls, bark and soil sheltered from direct rain; very common, often abundant; throughout UK (2).
Frequent in SP, on shaded bark in both ancient and secondary woodland; frequent at OS on sheltered sides of gravestones and on outer church wall; frequent at KN on gravestones and trees (horse chestnut); on furnace slag at LP and MW; AP on *Acer* sp.; ER; GB; HC; BU on ash bark; BB on War Memorial; SC; SPC; CCC; PCW.

Lepraria lobificans
Leprose, margins obscurely lobate; on surfaces sheltered from the rain, on bark, wood, siliceous rock, limestone, mortar and soil; widespread and often abundant, especially in the W of UK. Less tolerant of acid substrates than *Lepraria incana* (6).
Occasional in SP, on shaded bark S of Streetly Gate; LP on furnace slag; GB.

Lepraria membranacea
Leprose with marginal lobes; on shaded, vertical, acidic surfaces sheltered from the rain; fairly common in upland Britain (6).
MW on furnace slag.

Lepraria vouauxii
Leprose or margin slightly delimited; on surfaces sheltered from the rain, on siliceous rocks, limestone, mortar and bark, avoiding the most acid substrates; widespread and frequent in lowland Britain (5).
Rare at SP on mortar courses of low walls at NE corner of Powell's Pool; also at LP a single gathering from very sheltered furnace slag, but needs thin layer chromatography to confirm; BB sheltered brickwork, W side of reservoir walls; FO on shaded garden wall.

Leptogium schraderi
Thallus made up of tufts of cylindrical lobes; on mosses and soil in ±dry, calcareous habitats, particularly in old, mortared walls; locally abundant throughout UK (6).
Rare at SP, in mortar course of wall at S side of Keeper's Pool.

Leptorhaphis maggiana
Immersed; on hazel and young branches of sweet chestnut; rare in UK.
SV.

Melanelixia fuliginosa
Foliose; common in UK on rocks and acid gravestones.
Notably abundant at OS on many sandstone gravestones.


Melanelixia fuliginosa (left) on a gravestone at OS (×1/5); photo Ian Trueman


Melanelixia glabratula (right) at OS (×3); photo Ian Trueman

Melanelixia glabratula
Foliose; mainly on bark of many species of broad-leaved trees but also on siliceous gravestones and basic rocks; common throughout UK (3).
Rare at SP, corticolous, E of Bracebridge Pool; rare at OS, on horizontal sycamore branches; HC; BU on sycamore bark. DCL recorded it quite frequently (as *Parmelia glabratula*) from willow bark between 1980 and 1992.

Melanelixia subaurifera
Foliose; on smooth bark of neutral to acid-barked trees, especially horizontal branches, less commonly on trunks or rocks; very common in UK (4).
Frequent in SP, corticolous; rare at OS on horizontal tree branches (mostly sycamore); frequent at ER and SV; universally common at IL on tree branches; CC on a single

gravestone below a sycamore; HC; BB on oak branches, W-facing slopes; SPC. DCL recorded it on willow bark at Wychall Reservoir (SP0379) in 1984.

Melanohalea elegantula
Foliose; an open parkland species, mostly on ±nutrient-rich, acid-barked trees, increasing in relatively polluted areas (6).
Rare at SP, on oak E of Westwood Coppice.

Melanohalea exasperata
Foliose; mostly on well-lit, acid-barked, smooth twigs and branchlets of broad-leaved trees, especially in the W, but decreasing (8).
Rare at SP, on an oak twig S of Streetly Gate and fertile on oak N of the Donkey sanctuary.

Melanohalea exasperatula
Foliose; mainly on the trunks and branches of nutrient-rich, wayside, broad-leaved trees; widespread, but still only local in England (5).
Rare in SP, on oaks S of Streetly Gate and E of Westwood Coppice.

Micarea denigrata
Crustose, sometimes immersed; usually on fallen trunks, stumps, worked timber; common and widespread in UK even in polluted areas (4).
Rare in SP, on sawn cladding of outbuilding N of Powell's Pool; SV on wooden railings; FO on weathered fencing of neglected garden.

Micarea erratica
Crustose; scattered distribution in UK, often on siliceous pebbles in heathland areas.
SP on pebble by roadside near Jamboree Memorial.

Micarea lignaria
Crustose, sometimes immersed; common and widespread on various acid substrates (5).
SV on wooden railings; rare at SP as **var. *lignaria*** on shingle roof at Streetly Gate.

Micarea micrococca
Crustose; common even close to urban centres on acid bark, stumps, debris, soil, etc.
SP on holly stems N of Wyndley Pool.

Ochrolechia parella
Crustose; frequent on siliceous rocks, walls, brickwork, rarely on trees (5).
FO, young thalli on patio slabs.

Parmelia saxatilis
Foliose; was abundant throughout UK on acid-barked trees and shrubs and siliceous rocks, memorials, etc., but there is evidence that it is now decreasing and being replaced by *P. sulcata* and *Hypogymnia physodes* (4).
Only recorded in the main survey at three sites: rare at SP, corticolous and often poorly developed; on sandstone at BU; at SPC. Also a single colony was observed almost completely covering a 3-dimensional sandstone memorial at STC. DCL also had only a single record, on bark of a dead willow at Wychall Reservoir (SP0379, 1984).

Parmelia sulcata Taylor
Foliose; very common and increasing throughout UK on trees and siliceous rocks (4).
Frequent, corticolous; at SP, OS, AP, SV, AC, IL, GB, HC, ER, BB, SPC and also on a single gravestone below a sycamore at CC. It was also common in the 1980s: DCL recorded it, generally on tree bark, from 17 sites in our part of vc. 37 between 1973 and 1986.

Parmelia sulcata (left) on an oak branch, Penn (×3); photo Ian Trueman

Parmotrema perlatum (right) at BB (×1.5); photo Gemma Edwards

Parmotrema perlatum

Foliose; common in S and W UK in well-lit situations on neutral- to acid-barked trees and siliceous rocks, now colonising more polluted areas (7).

Occasional at SP, corticolous; SV on willows and young oak; IL on maple (rare) also on oak; ER on young oak branch; GB; HC; BB on oak branches, W-facing slopes.

Peltigera didactyla

Foliose; throughout UK especially on recently disturbed sites (4).

MW on furnace spoil. DCL recorded it in 1986 on soil amongst moss, at a derelict brickworks (SP0983).

Peltigera hymenina

Foliose; common in UK on fairly base-poor soil, mosses, rocks, in lawns etc. (6).

SP, terricolous on sandy bank SE of Bracebridge Pool; AP annexe; MW on furnace spoil. DCL recorded it in 1986 at a derelict brickworks site (SP0983).

Peltigera membranacea

Foliose; common on mossy tree trunks, rocks and ground throughout UK (5).

Not recorded in the present survey but seen by DCL in 1986 on soil amongst moss, derelict brickworks (SP0983).

Pertusaria amara

Crustose; usually on broad-leaved trees, throughout UK (5).

Recorded only at OS, on sandstone, a single widespreading colony.

Phaeophyscia nigricans

Foliose, habit ±shrubby; mainly on calcareous stonework and asbestos cement, often where nutrient-enriched; scattered in lowland UK, especially in the E (5).

SP, on plastic roof tiles of small building at SE corner of Westwood Coppice.

Phaeophyscia orbicularis

Foliose; corticolous and saxicolous; very common throughout UK on nutrient-rich or -enriched substrates (2).

Frequent in SP, corticolous and saxicolous; OS on horizontal sycamore branch; SV on trees generally; IL on maple (tree base and lower branches); HC; MW on fallen branches; BU on ash bark; BB on boulders at base of W side of reservoir walls.

Phlyctis argena

Crustose; on well-lit, deciduous trees; common in UK, pollution tolerant (5).

Rare in SP, corticolous, near the Toby Carvery.

Physcia adscendens
Foliose; common and increasing throughout UK in response to falling SO_2 levels and rising levels of nitrogenous compounds, on well-lit and nutrient–rich or –enriched substrates including limestone, concrete, tree trunks, branches and twigs (2).
Abundant at SP, corticolous, and at OS, KN, CP, CC, IL, SV, GB, HC, ER, MW, CCC , BU, BB, SPC, FO on branches, twigs, occasionally on memorials and sandstone.

Physcia aipolia
Foliose; common in UK on nutrient-rich or base-rich bark of trees, branches and twigs, possibly spreading (6).
Occasional at SP, corticolous; SV on trees in the Swan Pool car park and alders and willows fringing Swan Pool.

Physcia caesia
Foliose; usually saxicolous on well-lit, basic substrates, common in UK and pollution tolerant (3).
Rare in SP, on concrete slab W of the Gum Slade and on tarmac N of Wyndley Pool; SV on concrete kerbs; HC; AP; BU on concrete; BB on concrete kerbs, oak branches and twigs, War Memorial and on boulders at base of W side of reservoir walls; SPC.

Physcia dubia
Foliose, with lip-shaped soralia towards and at the ends of ±ascending lobes. Throughout UK on non-calcareous rocks and building materials in well-lit, nutrient-rich and –enriched situations (4).
SPC with *P. caesia* on top of small sandstone memorial beside S aisle.

Physcia stellaris
Foliose; branches and twigs of trees, mainly in little-polluted areas of UK (8).
SP on oak twig SE of Blackroot Pool.

Physcia tenella
Foliose; common and increasing in UK in response to falling SO_2 levels and rising levels of nitrogenous compounds, usually on bark (4).
Corticolous, abundant at SP and at almost all other sites visited: OS, KN, AP, IL, SV, GB, HC, ER, PCW, BB, BU, SPC, PCW, FO. Also on a single gravestone below a sycamore at CC.


Physcia tenella at BB (x 6) (del. Gemma Edwards)

Physconia distorta
Foliose; on basic or nutrient-enriched bark of trees throughout UK (6).
Not recorded recently but by DCL in 1980 on willow bark (SP1079).

Physconia enteroxantha
Foliose; common especially in N UK on well-lit nutrient-rich bark of trees, occasionally on old walls and memorials.
SP on mature willow trunk near Wyndley Leisure Centre.

Physconia grisea
Foliose; on basic, usually dust-impregnated nutrient-enriched bark of tree trunks and frequent on calcareous walls and memorials; common and increasing in lowland UK (3).
SV on trees in the Swan Pool car park..

Placynthiella dasaea
Crustose; on dead rotting bark and lignum of pine and gorse, occasionally spreading to soil rich in organic matter, also on well-weathered worked timber; scattered through England, Scotland and Wales.
Rare in SP, on upturned root plate of wind-blown tree SE of Bracebridge Pool.

Placynthiella icmalea
Crustose; in a wide range of acid habitats: dead bark and wood of fallen trees, rotting tops of fence posts, humus-rich soils, a primary colonist of heathland after burning (5).
Rare in SP, terricolous in Little Bracebridge Heath and on wooden shingles and wooden seating; BB in the *Calluna/Erica* heath.

Placynthiella uliginosa
Crustose; frequent throughout UK on peaty, heathland soils, dead bark and wood of fallen trees and stumps (6).
Rare in SP: terricolous on Little Bracebridge Heath and on wooden seating; BB in the *Calluna/Erica* heath. Also recorded in 1979 at Moseley Bog (DCL, SP0981 & SP0982) and in 1983 on soil at a derelict brickworks (DCL, SP0983).

Placynthium nigrum
Minutely squamulose, black, with an indigo-blue margin. Widespread in UK, especially on basic stones in churchyards. (4).
BB on consolidated mortar; also recorded from Sandwell Valley Country Park (SP029421) by DCL in 1987.

Platismatia glauca
Foliose; common throughout UK on trees, rocks and soil especially in leached, acid habitats (6).
Rare at SP, S of Streetly Gate on Oak branch; SV on wooden railings; ER on young oak branch. DCL had 8 records in the 1970s and 80s in our part of VC 37 on willow and sycamore bark and wooden railings.

Polysporina simplex
Crustose; common throughout England and Wales on acidic or weakly calcareous rocks, especially in churchyards on slate and granite memorials (6).
HC.

Porina aenea
Crustose; on smooth bark, often on trees with bark with a high pH (sycamore, ash), common in urban areas (8).
Rare at SP, near base of sycamore trunk.

Porina chlorotica
Crustose; on siliceous rocks and stones, often in shade and damp situations; frequent throughout UK, especially N and W (6).
KN, deep shade, church wall; LP, a single piece of furnace slag collected in a shaded and damp run-off.

Porpidia crustulata
Thinly crustose; mainly on siliceous rock, stonework, pebbles; frequent in lowland and urban areas (5).
MW on furnace slag.

Porpidia macrocarpa
Crustose, thallus immersed or thin; on siliceous rocks; boulders and pebbles; common, especially in the uplands (5).
MW on furnace slag.

Porpidia soredizodes
Crustose; siliceous rocks, stonework, pebbles and slate; throughout UK especially in the lowlands (5).
Rare at SP, on sandstone coping stones of railway bridge parapet and brick wall beside Wyndley Pool; OS, seen twice on acid gravestones; KN, often in association with *Buellia* species on granite gravestones and surrounds; IL, roof tile at back of farm; GB; AP main churchyard; BU on sandstone; BB on War Memorial; SPC; CCC; STC.

Porpidia tuberculosa
Crustose; on siliceous rocks, walls, pebbles; common throughout UK (4).
Rare at SP on sandstone coping stones of railway bridge parapet; OS, very frequent on both sheltered and exposed gravestones; KN, often in association with *Buellia* species on granite gravestones and surrounds; CC on granite gravestones and surrounds; GB; HC; AP main churchyard; MW on furnace slag; BU on sandstone; BB on War Memorial; SPC.

Protoblastenia rupestris
Crustose; on a wide range of calcareous substrates; common throughout UK (3).
Rare at SP on concrete pavers of culvert close to Wydley Leisure Centre; BB single colony in shade, W side of reservoir walls; FO on old mortar of neglected garden wall; SC.

Pseudevernia furfuracea
Foliose-shrubby, ascendant-pendant, with one or few points of attachment; on exposed, well-lit bark and wood on conifers and acid-barked deciduous trees; widespread in UK, especially N and W (6).
Rare in SP on a single hawthorn at SP098970.

Psilolechia clavulifera
Crustose, granular; on roots, stones and consolidated soil below dry overhangs on banks or on the root systems of fallen trees; rare throughout the British Isles.
Rare at SP on peaty soil and dead rootlets of upturned root plate of wind-blown tree SW of Bracebridge Pool.

Psilolechia leprosa
Crustose to leprose; on copper-rich rocks, mortar and stonework, below metal grills e.g. on church buildings; frequent in UK (5).
GB; HC.

Psilolechia lucida
Leprose-granular; often wide-spreading and conspicuous in dry, shady situations on non-calcareous rocks and walls; common in UK (3).
Rare at SP on a wall near the Toby Carvery; frequent at OS on church wall and on shaded sides of several upright gravestones; KN on church wall and several gravestones; GB; AP, main churchyard; BB on War Memorial; FO, sheets on sheltered brick wall; SC; SPC; STC; PCW.

Psoroglaena stigonemoides
Minutely fruticose, densely branched; on shaded bark in humid sites; frequent and widespread, easily overlooked.
FO, on branches of *Magnolia* in sheltered garden.

Punctelia jeckeri
Foliose; corticolous on broad-leaved trees; frequent and increasing in UK.
Occasional at SP, corticolous; SV, willows & young oak.

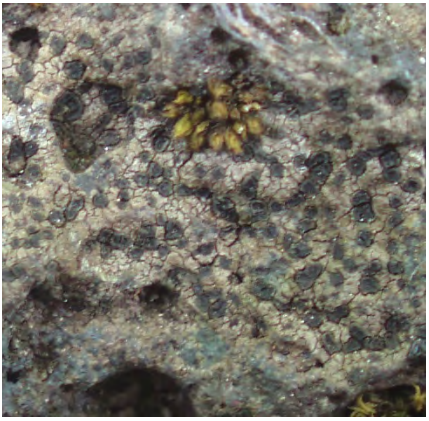
Punctelia subrudecta
Foliose; bark of broad-leaved trees, less often on wood, among mosses on siliceous rock, roofing tiles and standing stones; widespread in UK except in Scotland and industrial areas (5).
Occasional in SP, corticolous; CC on a single gravestone beneath a sycamore; IL on an older branch of maple; ER on sycamore; GB.

Ramalina farinacea
Fruticose, shrubby, pendant; in a wide range of situations, most often on nutrient-rich bark; common throughout UK, (5).
Occasional at SP, corticolous; SV on willows and young oak; IL on older branches of maple, elder, oak; BU on sycamore bark; BB on oak, W-facing slopes. Also recorded by DCL in the 1980s on willow bark (SP0379 & SP0982).

Ramalina fastigiata
Fruticose, tufted, usually erect; on well-lit, wind-exposed nutrient-rich bark; common in UK but very pollution-sensitive (9).
Rare in SP, on Oak twig S of Streetly Gate.

Rhizocarpon petraeum
Crustose; on hard siliceous rock close to mortar, ±base-rich rocks and walls; common throughout UK (7).
Rare in SP on sandstone in mortared wall beside Keeper's Pool; LP, a single thallus on furnace slag.

Rhizocarpon reductum
Crustose; on siliceous rocks, particularly gravestones; common throughout UK (6).
Rare at SP on brick wall on N side of Wyndley Pool; OS occasional on non-sandstone, acid-rock gravestones; widespread at KN on granitic gravestones and surrounds; GB; HC; AP main churchyard; LP, a few grey-brown, well-fertile thalli on furnace slag; MW on furnace slag; BU on sandstone; BB on War Memorial; SPC on church walls and associated paving stones of ornamental garden frontage. PCW.



Rhizocarpon reductum at MW (×5)

Rinodina oleae
Crustose; on calcareous, nutrient-rich and -enriched substrates: rocks, mortar, concrete, asbestos cement, bark and wood; pollution tolerant.
Rare at SP on brick wall beside Wyndley Pool and on Birch bark in wound track (recorded in 1990, as *R. gennarii*); GB; HC; BU on concrete. Widely recorded by DCL in the 1980s in our part of vc. 37 on tree bark and decorticated stumps.

Rinodina sophodes
Crustose; mainly on twigs of smooth-barked trees; widespread in UK, especially in the uplands (8).
Rare in SP, found twice on oak twigs.

Rinodina teichophila
Crustose; scattered on siliceous to weakly basic rocks; throughout UK especially in the lowlands (6).
FO, shaded walls of St James's church; SPC, scattered patches on W-facing, sheltered sandstone wall of S aisle.

Sarcogyne regularis
Crustose, generally immersed; on calcareous rocks, walls, asbestos cement, old mortar; frequent, especially in the lowlands (4).
Rare in SP, on concrete slab W of the Gum Slade and on mortar; KN, a single record on calcareous seam of gravestone; BB reservoir walls, E side, in sheltered recess.

Scoliciosporum chlorococcum
Crustose; on shaded damp, ±nutrient-rich or –enriched bark, less often on siliceous rock, pollution tolerant and growing with and replacing *Lecanora conizaeoides*; very common in UK (2).
SP occasional, on twigs; MW, fertile on tree base; FO on old magnolias, etc.; SPC. Also with 5 records in our part of VC 37 by DCL in 1980s.

Scoliciosporum sarothamni
Crustose; on ±nutrient-rich or –enriched bark of boles, branches and twigs; probably widespread in UK but overlooked.
Rare in SP on oak twigs near the Toby Carvery; KN on dead cherry twig (fertile).

Scoliciosporum umbrinum
Crustose; basic or siliceous rocks, memorials, rusty metal work and other metal-rich substrates, walls, compacted acid soils, branches, twigs and wood; widespread in UK and pollution tolerant (3).
KN on a single acid gravestone.

Stereocaulon nanodes
Squamulose; on sheltered rocks, often in damp situations, frequent on old lead-zinc mine spoil heaps, by roads in urban areas and associated with iron railings in churchyards; rather frequent throughout UK (3).
Rare in SP: on parapets of 2 bridges over the railway line, on mortar & sandstone.

Stereocaulon pileatum
Squamulose; on damp siliceous rocks, particularly loose stones, often on mine spoil heaps and in industrial and urban areas; rather frequent and increasing throughout UK.
MW on furnace slag. Also several DCL records in 1980s.

Strigula jamesii
Crustose, thallus thin ±immersed, perithecia semi-immersed; on bark.
FO, on aged elder near television station on Staffordshire border.

Tephromela atra
Crustose; on siliceous and slightly calcareous nutrient-rich rock and walls; very common throughout UK (3).
KN, a single record, acid gravestone; BB on War Memorial; STC.

Trapelia coarctata
Crustose; on well-lit siliceous rocks, pebbles and brick walls; very common in UK (3).
Rare at SP on sandstone, including a pebble lying in heathland SE of Bracebridge Pool; occasional at OS on ±flat, ±basic rock surfaces; frequent at KN on acid gravestones; GB; HC; AP annexe; furnace slag at LP and MW; BB on War Memorial; FO very common on old

walls; SPC, ±frequent on sandstone walls of church and associated paving stones; STC; PCW.

Trapelia glebulosa
Crustose to subsquamulose; mainly on siliceous rocks; throughout UK.
HC; FO on wall; SPC, ±frequent on sandstone walls of church and associated paving stones.

Trapelia obtegens
Crustose; on siliceous rocks and stones; throughout UK (5).
OS, a single specimen on flat surface of horizontal gravestone; SPC, ±frequent on sandstone walls of church and associated paving stones.

Trapelia placodioides
Crustose; on siliceous rocks, mine spoil and walls; common especially in the uplands (6).
Rare at SP on sandstone of wall by Keepers Pool and on tarmac N of Wyndley Pool; OS, a single, extensive thallus on flat, horizontal, ±calcareous cement surface; GB; HC; frequent on furnace slag at LP and MW; FO, single colony on brick wall; SPC, ±frequent on sandstone walls of church and associated paving stones.

Trapeliopsis flexuosa
Crustose; mostly on wood, often abundant; throughout UK (5).
Rare in SP on a weathered, fallen oak branch, on birch bark and on wooden roof shingles; SV on wooden railings.

Trapeliopsis granulosa
Crustose; usually on acid moorland soils and decayed wood; common throughout UK (3).
Rare at SP on lignum of large dead oak trunk in the Gum Slade; MW on furnace spoil; BB in the *Calluna/Erica* heath.

Tuckermanopsis chlorophylla
Foliose; on twigs, branches and trunks of trees, shrubs and posts; throughout UK (6).
Not seen in present survey but recorded by DCL from bark of railings in SP0180 in 1981. Also a record from 1980 for Sutton Park (Coxhead & Fowkes, 1992).

Usnea cornuta
Fruticose; common mainly on trees in S and W UK (7).
Rare at SP on oak branches SE of Streetly Gate.

Usnea flammea
Fruticose; rock faces, decorticated wood, wayside trees, shrubs and heather stems; widespread and locally frequent in S and W UK, especially near the coast (9).
Rare at SP, on branch of oak near Four Oaks Gate.

Usnea flavocardia
Fruticose; in boggy, undisturbed scrub and willow carr, rarely on mossy boulders; SW England, Wales and W Scotland.
Rare in SP, on dead lower branch of a mature oak N of Wyndley Pool.

Usnea subfloridana
Fruticose; on trees; common in UK, the most widespread and pollution tolerant *Usnea* (6).
Rare in SP on oak branches SE of Streetly Gate; ER on young oak branch; FO, young thalli on roadside lime trees. DCL had records on willow bark in 1979 (SP0379) and 1980 (SP0982) and on bark of railings (SP0180) in 1979.

Verrucaria baldensis
Crustose, immersed; on hard limestones, mortar; often abundant, throughout UK (4).
Rare in SP on large limestone rocks at overflow of Powell's Pool.

Verrucaria fuscella
Crustose, not immersed; on calcareous rocks or other rock and brick under calcareous influence; common and widespread in UK (4).
KN, often with *V. nigrescens* on ± basic stones and mortar; SPC.

Verrucaria hochstetteri (aggr.)
Crustose, immersed; on calcareous rock; common in UK (3).
Rare at SP on mortar of buildings near the Toby Carvery; very common at OS on calcareous substrates; rare at KN on cement, church wall; generally frequent at CC on ±basic substrates and mortar; ER on limestone in rockery, gardens; HC; AP annexe; PCW.

Verrucaria macrostoma
Crustose; on limestone, mortar and calcareous sandstone, often on walls; widespread in England and Wales (5).
Rare at SP on mortar of buildings near the Toby Carvery; GB; BB reservoir walls; PCW on mortar of S-facing walls.

Verrucaria muralis
Crustose, ±immersed; on limestone, mortar, brick, calcareous soil, pebbles; widespread and frequent in UK (3).
Rare at SP on mortar of buildings near the Toby Carvery; GB; HC; BU on concrete; BB reservoir walls; PCW.

Verrucaria nigrescens
Crustose; on well-lit calcareous rock and mortar; very common in UK (2).
Rare at SP on mortar of buildings near the Toby Carvery; frequent elsewhere on limestone, concrete, brick walls, furnace slag: OS, KN, AP, CC, SV, GB, HC, ER, MW, BU, BB, SPC, PC, SY, SC, STC, PCW.

Verrucaria viridula
Crustose, ±immersed; common on calcareous rock, mortar, brick, etc.; throughout UK (3).
Mortar of buildings near the Toby Carvery, SP; on mortar, frequent, KN; AP annexe; BB reservoir walls; SPC.

Xanthoparmelia mougeotii
Foliose, with yellow-grey, closely adpressed radiating lobes; convex to ±excavate soralia present. On well-lit siliceous rocks, also roofing tiles, slate, memorials, quartzite chips in churchyards. Widespread and common in uplands, increasing elsewhere (6).
SPC on small siliceous rock and also on broken tile on W side of S aisle of church.

Xanthoria calcicola
Foliose; on calcareous, nutrient-rich stonework, brickwork, tiles, monuments, rare on bark and wood, frequent in England and Wales (4).
Rare, SP, on wall at E end of Wyndley Pool; FO on old wall with *Xanthoria parietina*. Also records by DCL in 1980s.

Xanthoria candelaria
Subfruticose; on nutrient-rich substrata such as tops of fence posts and gravestones used as bird perches; widespread and often common throughout UK (5).
Trees generally at SV; oak branch, ER; HC. Also recorded by DCL in 1980s.

Xanthoria elegans
Foliose; well-lit, nutrient-enriched, siliceous and calcareous rocks used as bird perches, also concrete and slate and asbestos cement roofs; throughout UK, local (6).

Rare at SP: brick wall beside Wyndley Pool and on concrete wall beside Longmoor Pool; BB three thalli on reservoir walls, N end of W side.

Xanthoria parietina
Foliose; very common throughout UK on a wide variety of nutrient-rich and –enriched substrates including trees, rocks, walls and roofs (4).
Frequent at SP on enriched bark and man-made structures and at all other sites on trees, branches, twigs and sometimes gravestones and concrete.

Xanthoria polycarpa
Foliose; common and increasing in the UK on nutrient-enriched, dead and living twigs and fencing (4).
SP: occasional, corticolous, locally frequent on twigs and in similar situations at most other sites: OS, KN, CC, SV, GB, HC, ER, BU, BB, SPC, CCC, PCW.

Xanthoria ucrainica
Foliose; on bark of broad-leaved trees, stone and man-made substrates; very common in UK but under-recorded.
Occasional, corticolous, in SP; poorly developed on horizontal sycamore branches, OS; dead twigs of cherry, KN; occasional on twigs, IL; BU on ash and lime.

Xanthoria ulophyllodes
Foliose; in well-lit, humid situations on bark of broad-leaved trees, stone and human-made substrates in churchyards; scattered in England and Scotland.
On dead twigs of maple, CC.

Lichen photobionts attend church

We know the wonderfully good job that lichen photobionts do for fungi. Now these apparent cinderellas of the plant world seem to have sprouted wings. This was discovered when DJH was asked to help with an investigation on the dirt on the inside of the windows of Gloucester Cathedral. Samples scraped from the inside of the windows were sent for microscopic investigation because of the possibility that living organisms were at least part of the problem. When DH examined one of them was surprised to see familiar trebouxioid cells like those in lichens (Figure 1). Thinking how difficult microscopic algae are to identify, he sent the sample to CG at the Natural History Museum in London. CG was able to prepare two DNA extracts of the algal material, which were likely to comprise more than one algal species. Using suitable primers, the chloroplast phylogenetic marker rbcL was amplified with PCR and resulted in four forward or reverse DNA fragments with high quality chromatograms. After a failed attempt to assemble these fragments into contigs, a blast search and a preliminary alignment revealed that they in fact corresponded to four different algae! These DNA sequences were then added to an alignment of the green algae and ran through a phylogenetic analysis. The resulting tree (Figure 3) shows that two of them cluster within the *Diplosphaera* group (previously also referred to as *Stichococcus*) (Figure 2) and the two others are sister to the genus *Asterochloris* (Figure 1), two green algal genera that include a large number of lichen photobionts. The question remains: were these actually photobionts and if so what were they doing in church on the inside of the glass? An obvious thought is that they did not know that there were not in a lichen and mistook the glass for the cortex of a lichens. The missing bit of information was the colour of the glass! Has anyone else observed lichen photobiont genera growing on the inside of windows? Maybe there is a possible a future research project here especially with glasses of different colours!

The occurrence, abundance and frequency of "free-living" lichen photobionts in natural habitats has been infrequently investigated. Some investigators have found trebouxioid algae to be quite frequent (Tschermak-Woess 1978, Bubrick et al. 1884, Sanders 2005) whilst others notably (Ahmadjian 1993) claimed them to be very rare or non-existent. There seems little evidence that researchers have looked for *Trebouxia* or other potential lichen photobionts under the surface layers of rocks and bark in pores, fissures and crevices. Here is a habitat similar to that under a cortex inside a lichen thallus. Living on the inside of a window might be considered a similar type of habitat with filtered light and no snail browsing. Nowadays DNA extraction and sequencing could replace microscope identification of the algae. Can anyone help DJH with references to investigations on this?

Acknowledgements: Thanks to Steve Clare of Holy Well Glass and Keith Hallam of the Interface Analysis Centre (Department of Physics, University of Bristol).

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David J Hill
Cecile Gueidan

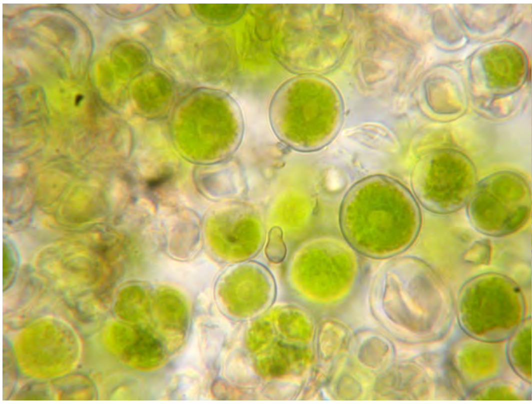

Fig. 1. *Asterochloris* from inside surface of Gloucester Cathedral window.

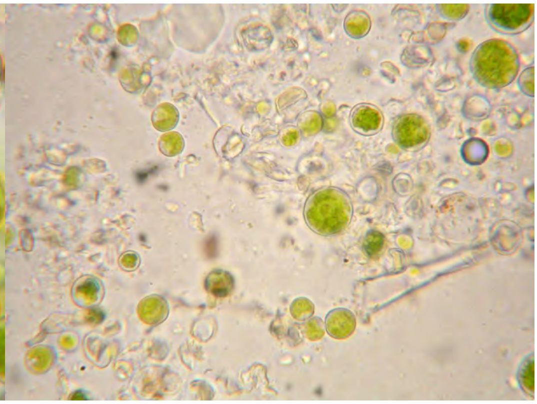

Fig. 2. *Diplosphaera/ Stichococcus* (larger cells *Asterochloris*) from inside surface of Gloucester Cathedral window

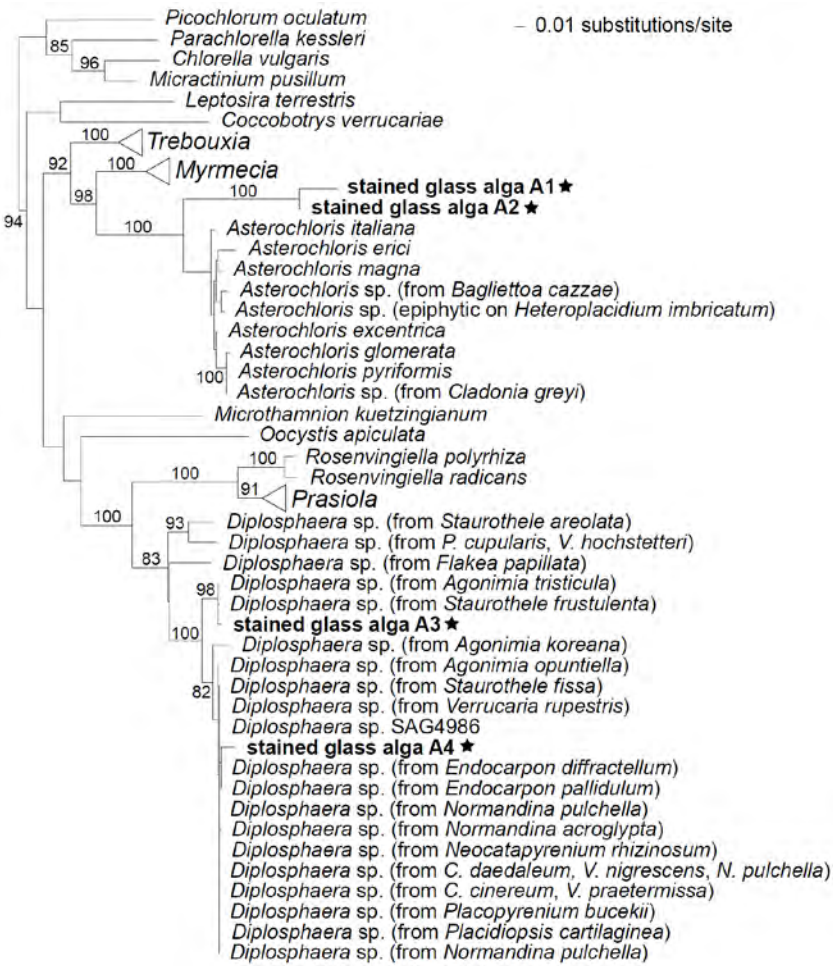

Fig. 3 DNA sequence tree showing how algae from the inside surfaces of Gloucester Cathedral windows cluster with lichen photobionts.

Is *Normandina pulchella* on the move in the UK?

On a field day for BioFellows in Lathkill Dale NNR in the Peak District Park. on 21 June 2013, Catherine Tregaskes (RSPB) drew my attention to the mossy trunk of a mature ash (*Fraxinus excelsior*) near the footpath in the bottom of the dale (SK 18983.65731, accuracy 5 m). She wondered if she had found *Normandina pulchella*, a species demonstrated to BioFellows on an excursion in the New Forest just a few weeks before, on 8 June 2013. She was right. The lichen was represented by a single patch of about 2 x 1.5 cm, with an estimated 15–20 squamules. The lichen was not noted on other trees so, in fear of rendering it extinct at the site, we refrained from collecting a voucher specimen, and the participants satisfied themselves with a good look with their hand-lenses. As evidence, a digital photograph was taken by another BioFellow, Geoffrey S. Hall (Fig. 1).

Fig. 1. *Normandina pulchella* on the mossy bark of a mature *Fraxinus excelsior*, Lathkill Dale, Derbyshire, 21 June 2013. Photo: Geoffrey S. Hall.

This was a great surprise to me. Indeed, I was in shock since, as far as I could recall, this species had never been recorded from the Midland counties. Further, this part of the dale had had repeated visits from lichenologists over the last half-century. These included visits during meetings of the BLS in 1964 (with Peter W. James), myself (many visits in the mid-1960s and early 1970s), the late Oliver L. Gilbert (several times from the early 1970s to about 1994) and, most recently, the BLS in 2009 (although they concentrated on the northern section, Price 2010). On checking the records in the BLS Mapping Scheme, it emerged that the nearest known post-2000 site was Wenlock Edge in Shropshire (SO/59), 90 km to the south-west, where it turned up on a BLS excursion in 2001[1]. The other recent "closest" records I could locate were those from Fordham Wood in Cambridgeshire (TL/66; 230 km away) by Mark Powell in November 2012 (Hitch 2013), and Ampthill in Bedfordshire (TL/03; 187 km away) on the BLS Bedford Field Meeting in October 2012 (Powell 2013). These discoveries came after the species was found on Ashtead Common in Surrey on the post-AGM BLS excursion

[1] There is a closer "mystery" dot for SP/08 (about 70 km away) which appeared in the BLS maps sometime after 1989 but before 1999. The source or a locality for that record could not be located by Mark R.D. Seaward, who has now deleted it from the BLS records as it is currently unsubstantiated.

in 2011 (TQ/179.594; 287 km away; Cannon & Powell 2011). It had not been recorded during a previous BLS visit to the Common 15 years earlier (Dobson 1996) and the 2011 find was the first ever record for Surrey; . However, on 26th July 2013, I discovered a second site Surrey site in woodland (Teazle Wood/Leatherhead Common, Leatherhead (TQ/156.584; 285 km away from Lathkildale?)!

Powell (2013) commented that this lichen was expanding its range in the Netherlands, and the above evidence suggests that this is also happening in England. It seems likely that this is a new phenomenon as: (a) the species is amongst the easiest to recognize in the field (but beware the squamules of some *Cladonia* species); and (b) several of the sites in which it has been found in the last few years had been examined previously by experienced lichenologists who did not report it. The species was regarded as a member of "zone 8" in the sulphur dioxide bio-indication scale for England and Wales, i.e. appearing at mean winter levels of about 40 μg m^{-3} (Hawksworth & Rose 1970), so its appearance was to be expected now that sulphur dioxide levels in much of lowland Britain are around or below that figure. As all the records so far have failed to comment on the presence of ascomata, my bet is that its spread is by soredia on birds' feet.

An addendum to this evidence of expansion is that caution is needed in the interpretation of the value of the species as an indicator of ecological continuity in woodlands. In particular, we need to consider carefully the statements that (a) this species was one of several which "are indicators of old forest in some parts of Britain but not in others", for example in East Anglia (Hawksworth *et al.* 1974) where it has a "relict distribution pattern in old woodlands, and old sheltered parklands" (Rose 1976), or (b) is "characteristic of less altered ancient woodland" (Rose 1992), and further (c) its inclusion in the East of Scotland Index of Ecological Continuity (ESIEC; Coppins & Coppins 2002).

It will be interesting to see the trends of the records of this most distinctive lichen in the coming years and decades, and whether they establish incontrovertibly that the species is indeed on the move! Further, will it prove to be significant that most of the recent finds seem to be in sheltered and presumably relatively humid sites inside woodlands or valley bottoms?

Acknowledgements
I am indebted to Catherine Tregaskes for her keen eyes, Geoffrey S. Hall for the photograph, the DEFRA (Natural England) BioFellows project of the Field Studies Council, and both Janet Simkin and Mark Seaward for delving into the basis of records held in the BLS Mapping Scheme.

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The effects of background N deposition

The following paper is from *Plantlife* (the wild plant conservation charity), and circulated to the BLS Conservation Committee. The paper was drawn up by Trevor Dines and colleagues, to act as a background paper for the Plant Link network. Members of the Conservation committee felt it merited wider dissemination amongst the BLS, so Plantlife have agreed to it being published in the Bulletin.

Atmospheric nitrogen (N) pollution and biodiversity

1. What is atmospheric N deposition?

The effects of eutrophication (nutrient enrichment) on terrestrial and aquatic habitats have long been known and are well documented. Generally, we consider eutrophication to relate to the application of organic and inorganic fertilizer to agricultural land and its subsequent effect on both that land (and its immediate surroundings) and in water bodies as a result of run-off. Many effective measures are in place to reduce levels of agricultural eutrophication from these sources, such as the establishment of Nitrate Vulnerable Zones (NVZs) and the planting of woodland buffer strips.

Much less appreciated, though, is the impact of atmospheric nitrogen deposition on a much wider suite of habitats and their constituent species at a broader scale. The deposition of atmospheric nitrogen (mainly from nitrogen oxides (NOX) and ammonia (NH_3) emissions) affects a very large swath of Britain and is much less discriminatory, not being confined to agricultural land or water courses.

Globally, this issue is now being taken very seriously. The Millennium Ecosystem Assessment (MEA), National Ecosystem Assessment (NEA) and NERCs Global Nitrogen Enrichment (GANE) programme all identify atmospheric N deposition as one of the top two drivers of change in plant diversity, along with climate change. Both nitrogen and climate change operate synergistically, producing very long term trends. The CBDs' Aichi Biodiversity Targets includes Target 8: *By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.*

2. Evidence for impacts of eutrophication

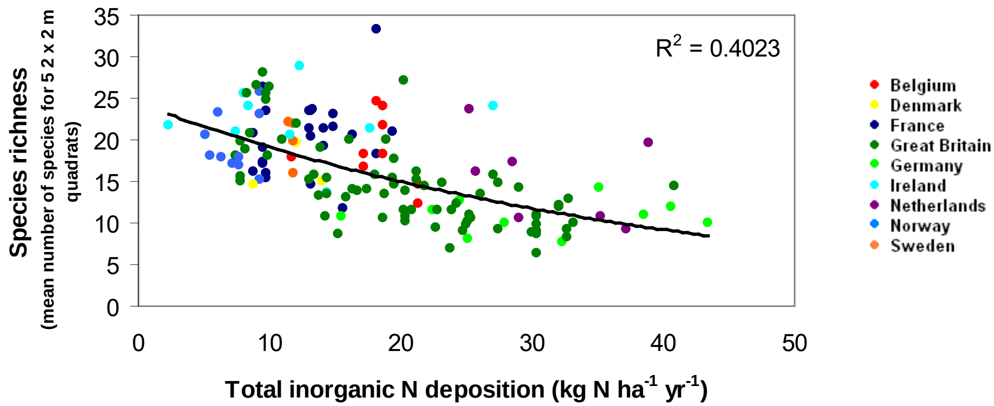
There is an accumulating body of evidence to show the negative effect of eutrophication, both at the national and local level and across all plant and fungal groups. A headline conclusion in the summary of Defra's RoTAP (Review of Transboundary Air Pollution) report states:

Nitrogen deposition is associated with adverse effects on terrestrial biodiversity at a UK scale. There is strong evidence that nitrogen deposition has significantly reduced the number of plant species per unit area (species richness) in a range of habitats of high conservation value over large areas of the UK

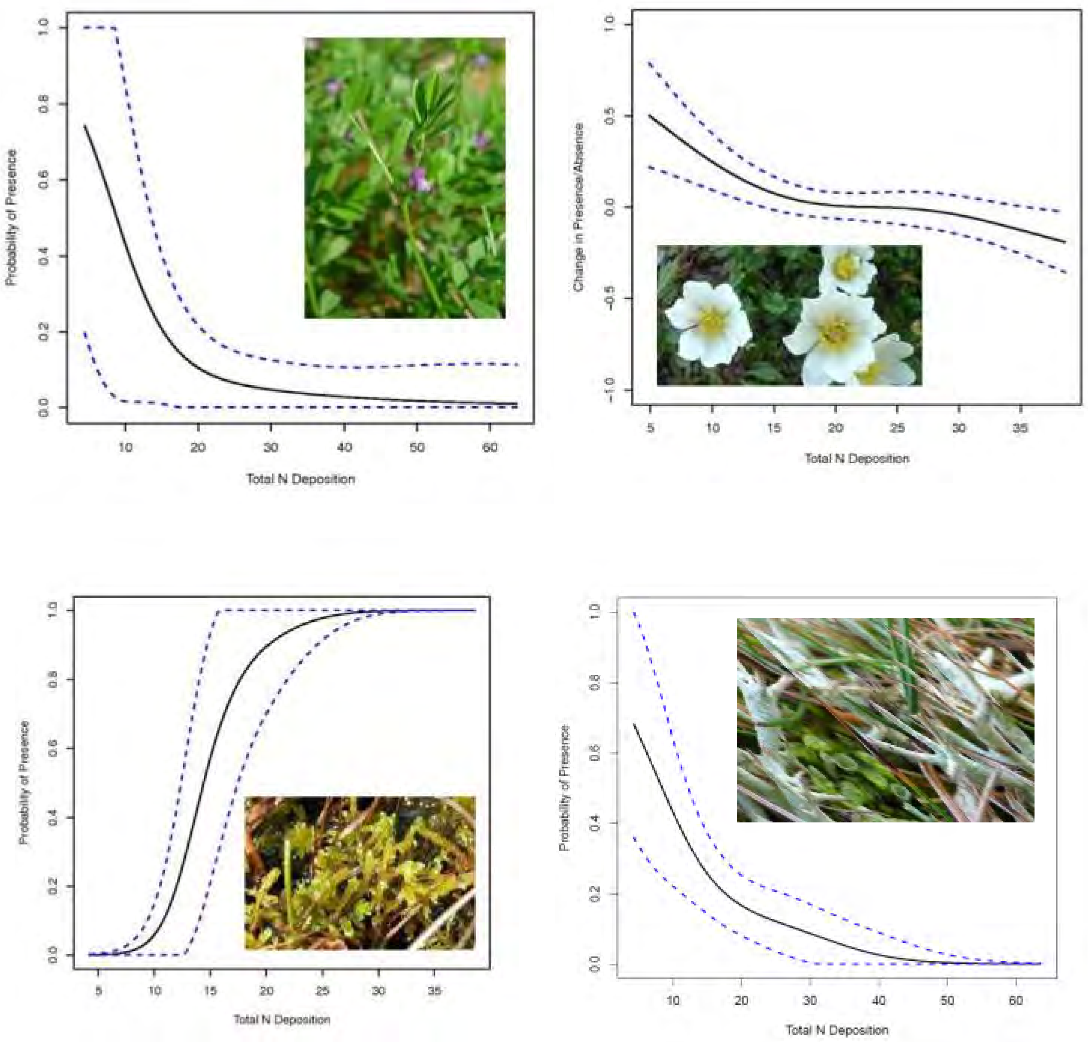
National distribution atlases and major recording projects including the BSBI's Local Change and the Countryside Survey all report clear signals for a decline in species of infertile habitats and an increase in species that benefit from high levels of nitrogen. Information from eight such national vegetation datasets have been collated in the JNCC report (Stevens *et al.* 2011) which provides the best summary of our current knowledge. The reports' key findings include:

- *There is clear evidence, both from other investigations and from this study, that N deposition has an impact on vegetation.*
- *A number of sensitive vascular plant, bryophyte and lichen species are at risk of decline in high deposition areas.*
- *All of the habitats examined showed signs of nutrient enrichment related to nitrogen deposition.*
- *All habitats contained species which showed declines in their probability of presence with increasing N deposition.*

Across Europe, there is a strong correlation between increasing N deposition and decreasing species richness of grassland (Stevens *et al.*, 2010):



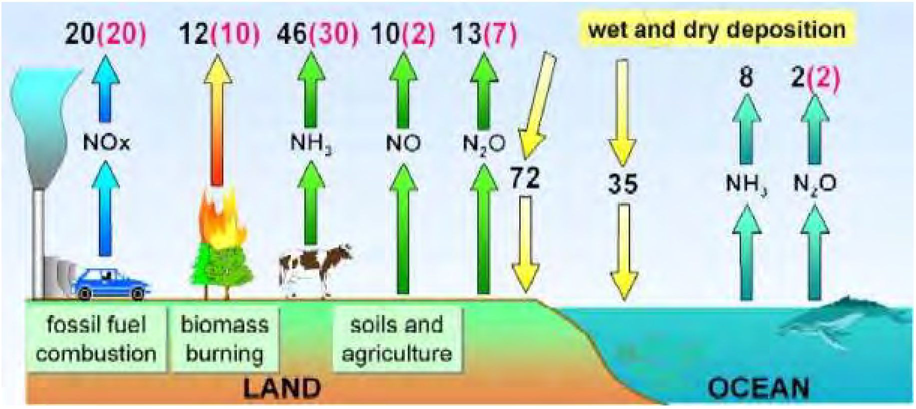
Different species show different responses to increasing nitrogen deposition. Some show no significant change while others increase and others decrease:

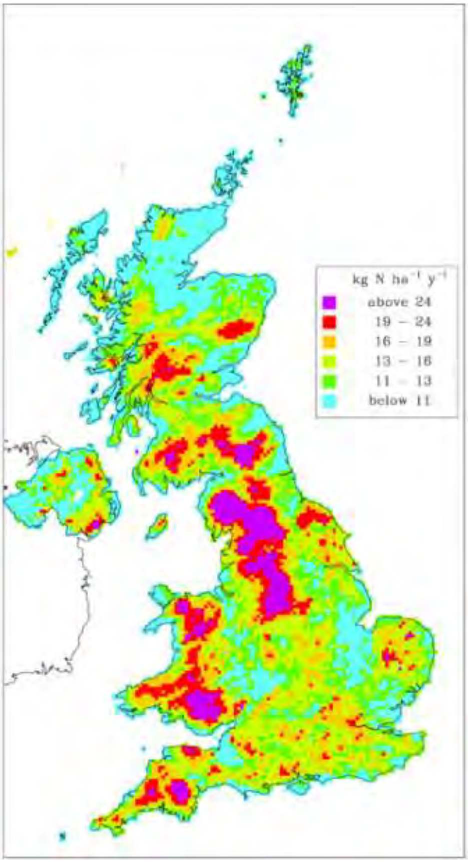


ABOVE: Impacts are variable for most taxon groups. Some species are very sensitive (e.g. **Spring Vetch**, top left), others less so (e.g. **Mountain Avens**, top right). Bryophytes tend to show more positive relationships, i.e. they increase with N deposition (e.g. ***Warnstorfia fluitans***, bottom left), while most lichens are extremely sensitive (e.g. ***Cladonia uncialis***, bottom right). Reproduced by kind permission of C. Stevens, pers comm.

3. Sources of atmospheric N

There are three main sources of atmospheric nitrogen, burning of fossil fuels (especially industry and car exhausts), emissions from agriculture and the burning of biomass (such as forest fires). The global nitrogen budget in kilotonnes is shown below - figures in red show the man-made contribution to each element:





Agricultural sources account for 80% of all N deposition in GB and include emissions of ammonia from organic and inorganic fertilizer that is spread onto fields and, most importantly, from livestock, especially high-intensity livestock units such as large-scale diaries and battery chicken farms. Note that off the total global budget, 69% comes from anthropogenic sources.

4. Mapping out the problem

Sources of atmospheric N are separated into "far-field" sources (such as transboundary pollution e.g. industrial scale power generation) and "near-field" or point sources (such as poultry farms). Both these contribute to N deposition.

The level of N deposition in any one area is dependent on two main factors, rainfall and the amount of atmospheric N. Since this latter is usually a combination of far- and near-field sources, nitrogen deposition is not totally correlated with high rainfall alone; deposition rates in highland Scotland, for example, are lower than expected because of a lack of local atmospheric N sources (this does not diminish their impact though – see below).

Rates of N deposition across GB vary from c.11 to 35 kg per hectare per year. The map (above) shows deposition levels in 2006.

5. Critical loads

A *critical load* is a measure of the sensitivity of a species or habitat to nitrogen deposition. The critical load represents the tipping point of the species or habitat, above which habitat degradation and species loss can be expected. Critical loads are important because, as we have seen, species react differently to nitrogen. Some habitats are much more sensitive (i.e. they have a lower critical load) than others. Many very sensitive habitats occur in areas that exceed the critical load, even in areas of lower N deposition.

Examples of critical loads (see APIS website for more details):

Habitat	**Level of N deposition (kg/ha/pa)**
Coniferous woodland	5-10
Broadleaved woodland	10-20
Montane calcareous grassland	5-10
Moss and lichen dominated summits	5-10
Dry calcareous grassland	15-25
Raised and blanket bogs	5-10
Inland lakes	3-10
Saltmarshes	30-40

The effects of exceeding the critical load for nitrogen over a short period of time are serious, with species loss and habitat degradation observable in as little as 20 years.

MOST IMPORTANTLY: 48% of habitats in the UK are currently estimated to exceed their critical load.

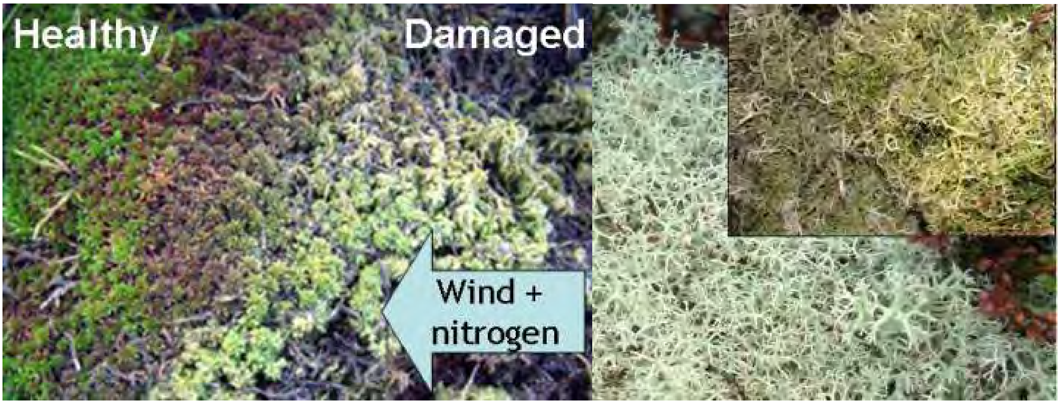
The "background" level of N deposition in the 1890s-1900s (estimated from analysis of herbarium specimens) was 2kg/ha/pa. **Today it is around 15-35kg.**

The APIS website provides information on whether critical loads are being exceeded on any habitat within any protected site (SAC, SPA or SSSI) in the UK, and gives the source of the atmospheric N.

Critical loads are important because they provide the only way to monitor the effects of N deposition. Reporting of habitat status to Europe through Article 17 of the Habitats Directive now includes an assessment of critical loads. If a protected site is in favourable condition, no further action is taken. But if a site is in unfavourable condition and it's in an area where the critical load is exceeded, this must be reported as a possible cause (amongst others) of unfavourable status. The projected deposition rate for the site in 2020 is also reported, as are source of the emissions. As well as highlighting the importance of far-field N pollution (and need for control), site management must also be addressed. This can include the identification and mitigation of near-field (point) sources of N pollution and site-specific management measures to reduce fertility, such as hay-cutting or reduction in fertilizer use.

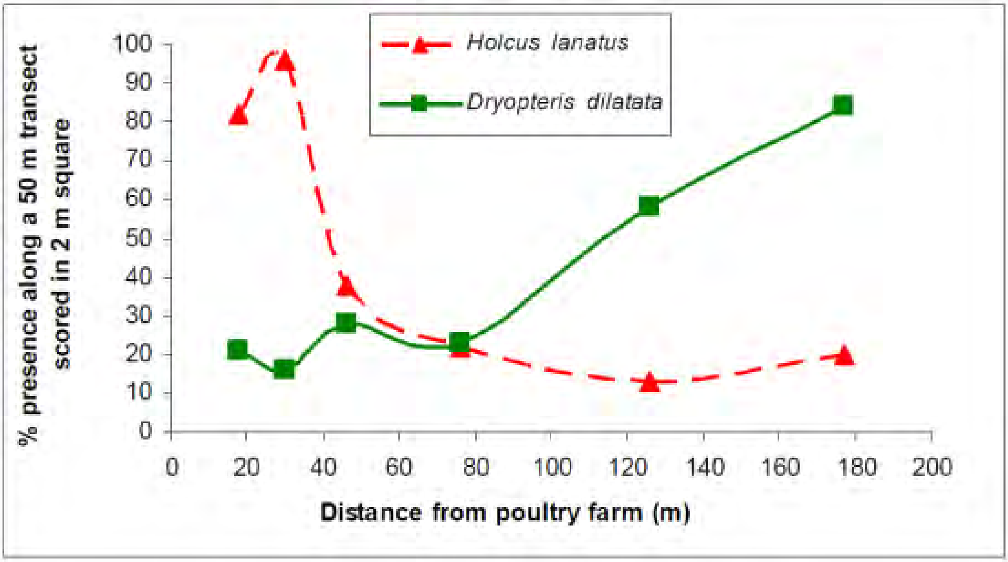
6. Local effects and damage

The effects of N deposition on plants and fungi can take several forms. In the most extreme cases, exhibited by highly sensitive bryophytes and lichens, direct tissue damage can be observed (see below). In higher plants, the effects are usually less obvious. A higher growth rate and competitive advantage is exhibited by nutrient-loving species, which then literally smother their less competitive neighbours. Physiological changes can also occur, such as an increased sensitivity to cold, as can life-cycle changes, such a greater reproductive capacity (e.g. more seed is produced). Such reactions can alter the delicate balance of competition and stress within the vegetation components of a habitat. Nutrient enrichment in Snowdonia, for example, has led to increased bryophyte and grass cover of tiny cracks and ledges on rock faces and boulders, which in turn has led to reduced seedling establishment in Tufted Saxifrage.



Direct damage to *Sphagnum* moss (left). Damage to *Cladonia* lichen (right). Main picture shows healthy lichen, insert shows a bleached effect and algae overgrowing the main structure of the lichen, leading to significant damage.

Acute effects are often observed close to nitrogen sources, especially pig and poultry farms that release very high levels of ammonia. In the photographs below (taken from *Ammonia and nature conservation*, Environment Agency Factsheet), ammonia was released to simulate the effects of a pig or poultry farm on a bog habitat. Damage was observed when the amount of nitrogen depositing to the land was around 8 to 10 kg/ha/pa (remember the current average level of deposition in the UK is ca. 20 kg/ha/pa). Around poultry units, effects of N deposition can clearly be seen. In the study below, the more nitrogen tolerant Yorkshire Fog (*Holcus lanatus*) increases in abundance closer to the poultry farm, whereas the less nitrogen-tolerant fern Broad Buckler-fern (*Dryopteris dilatata*) decreases in abundance.



Taken from *Ammonia and nature conservation*, Environment Agency Factsheet.

7. Who's doing what?
JNCC and the country conservation bodies collaborate on air pollution work through the Inter-agency Air Pollution Group (IAPG). They provide joint responses to UK Government and EU consultations, to provide advice on air pollution impacts on biodiversity and ecosystems and collaborate on research projects.

Key contacts include:
JNCC – Dr Clare Whitfield
CCW – Simon Bareham and Khalid Aazem
NE – Dr Zoe Russell
SNH – Alison Lee & Mike Shepherd

In addition, Dr Carly Stevens (Lancaster University) and Bridget Emmet (CEH, Bangor) are leading much of the research in the UK.

8. What can PLINK do?
PLINK could provide an important voice in two areas, policy and awareness-raising. Chris Cheffings (JNCC), Simon Bareham (CCW) and Carly Stevens (Lancaster University) have all welcomed PLINK exploring these areas and our potential involvement. In particular, the timing for our involvement is good because people in

the policy arena are beginning to take notice of the evidence; an additional combined voice from PLINK could help change opinions and effect policy change.

Areas where a policy lobbying is needed:

1. General reductions in N emissions from agriculture and industry. In Denmark and the Netherlands, governments have set targets for a reduction in ammonia emissions by 2030 so that no habitat critical loads are exceeded. Germany is also moving towards a similar target. The UK government was adopting similar targets but have now stepped away from this commitment.
2. Planning regulations must include the consideration of point-sources in sensitive areas. High-intensity livestock units, in particular, must not be sited near areas of sensitive habitat, as these can tip the scale of N deposition locally and result in severe impacts.
3. Vehicle emissions are not reducing. While catalytic converters have reduced emissions of large particulates, they are not effective in reducing ammonia levels. These are a major source of near-field emissions, with particularly severe impacts on sensitive habitats close to major roads.

Our other main role could be in raising awareness of the issue. As a cross-taxon plant conservation forum we are in a unique position to bring together research and information from a wide variety of sources and make this relevant to target audiences, including the public, land managers, politicians and other conservation organisations. An example for MPs would be the production of constituency-level reports on critical loads using the APIS data - "how fertilized is your constituency?" - including examples of where critical loads are exceeded on local protected sites and projected levels for 2020.

Both Simon Bareham (CCW) and Carly Stevens (Lancaster University) have offered to join a future PLINK meeting to discuss the issues and potential ways that PLINK could help.

9. Sources of information

The Air Pollution Information System (APIS), developed in partnership by the UK conservation agencies, regulatory agencies and CEH, has an excellent website (see http://www.apis.ac.uk/overview/pollutants/overview_N_deposition.htm).

Defra and CEH also maintain the Review of Transboundary Air Pollution (RoTAP) website (see http://www.rotap.ceh.ac.uk/home), which reviews the current state of rural air pollution issues in the UK, evaluates the extensive measurements of atmospheric pollutants and their effects, and produces a synthesis of current understanding which will be used to determine air quality policies. A summary of the main report into these issues for policy makers is available on the website.

NERCs Global Nitrogen Enrichment (GANE) research programme has many useful reports, looking at all sources and effects of nitrogen in terrestrial and aquatic ecosystems (see http://www.nerc.ac.uk/research/programmes/gane/background.asp).

10. Key References

There are many, but a comprehensive listing can be found within these reports:

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Stevens, C., Dupré, C., Dorland, E., Gaudnik, C., Gowing, D., Bleeker, A., Diekmann, M., Alard, D., Bobbink, R., Fowler, D., Corcket, E., Mountford, J.O., Vandvik, V., Aarrestad, P.A., Muller, S. & Dise, N.B. (2010). Nitrogen deposition threatens species richness of grasslands across Europe. *Environmental Pollution* 158: 2940–2945. http://oro.open.ac.uk/22820/2/stevens_et_al.pdf

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Invertebrates for lichenologists

No. 1 in an occasional series: The Ashy-Black Slug (*Limax cinereoniger)* – this invertebrate is one for lovers of ancient woodland

Limax cinereoniger is Europe's largest terrestrial slug, measuring 100 – 200mm (sometimes reaching lengths of 300mm), and is considered to be an indicator species of ancient woodland, even if that woodland has been subject to replanting. In daylight hours they are most likely to be seen in wet weather – typical western woodland conditions I hear you say.

As its name suggests they are mostly ashy-black but whilst the colour can vary this species is distinct from *Arion ater,* that more common black slug. *Limax cinereoniger* has a concentric ringed 'finger-print' pattern on its mantle, a keel stretching from tail to mantle and the sole is whitish centrally with in adults dark stripes on either side. If unsure pick one up and have a look. Unlike *Arion ater* it does not withdraw into a hemispherical shape. It is widespread across Britain and still common in many sites although probably declining . In Ireland it is genuinely rare.

Limax cinereoniger photographed at Rivelin, Sheffield © Robert Cameron, showing the the keel and the 'fingerprint' on the mantle.

To help with identification, a test version of an *Aidgap Key to the Slugs of Britain and Ireland* is at the time of writing available to be downloaded and can be found by searching the internet for 'aidgap_slugs_key_test'. Records can be submitted to Adrian Norris at The Conchological Society of Great Britain and Ireland, email: nonmarine@conchsoc.org

There is one small complication, the nature of which will be familiar to lichenologists. I have been informed that there are least two species going under the name *Limax cinereoniger* and possibly more. In Britain the new species appears to be confined to Yorkshire at the present time. This is subject to publication later this year, hopefully!

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The Importance of Diocesan Representatives for lichen conservation

In May 2013 Eluned Smith, the BLS Diocesan representative for Worcester and Hereford Dioceses, received a request for advice regarding a 300-year-old chest tomb in need of conservation and restoration which, as we all know only too well, usually results in the removal of lichens! Eluned and Ivan Pedley met with the Secretary of the Parochial Church Council (PCC) of St Andrew's church in Hampton, Evesham and the following report was submitted to the PCC by Ivan.

The John Martin chest-tomb in the parish churchyard of St. Andrew of Hampton

A lichen assessment and recommendations for conservation.

The condition of the tomb

The overall condition of the chest tomb is excellent considering that it is nearly 300 years old. Spalling due to frost action has caused some fragmentation on the south and the west faces and this should be stabilized using suitable lime mortar sympathetic with the surrounding stone in colour and texture. These supporting slabs appear to be of soft sandstone and their structural integrity after such a long period is, in part, due to the protective overhang of the limestone lid. They appear to have been recently re-pointed using lime mortar and, whereas the quality of this renovation is acceptable, the addition of a stain to the mortar to blend it into the colour of the original stone would have softened its appearance. A limestone block has been replaced in the footings of the western face which appears to be of similar geology to the adjacent stones and is beginning to pleasingly blend in due to colonization by lichens.

The western face is discoloured with carbon deposits from coal burning when this was the main fuel used by the village community. This might be removed with clean water applied carefully with soft brushes but will almost certainly expose the stone to increased erosion. It could be argued that this small area of blackened stone, which detracts little from the striking appearance of this tomb, be retained as an educational reminder of what the village environment was like in the past.

Regilding the inscriptions on the cartouche and slate panel may be carried out, if considered necessary, without damaging the surrounding lichen flora, but this will do little to increase the present considerable character of the tomb.

The Lichens supported by the tomb:

This is remarkable and probably represents a climax community which has developed over the 3 centuries of the tomb's existence. Thirty three lichen species were recorded from the tomb—others are present but their identification was not determined as samples would have had to be taken for analysis. Many of the lichens are also found on other memorials in the churchyard and on the church itself but they still represent an astonishing diversity on such a small structure. The tapestry of colours produced by this lichen community gives the tomb a wonderful charm and timeless dignity and, in addition, two of the species found on the lid, *Caloplaca variabilis* and *Leptogium plicatile,* are scarce in the county and should not be disturbed.

The ecological importance of lichens is difficult for the general public to appreciate as they rarely feature in popular natural history programmes but, to put this tomb into context, if it were a three hundred year old wild flower meadow it would be designated as a SSSI [Site of Special Scientific Interest]; if it were an unexploited oak wood of similar age it would be of county and national importance. These comparisons should put the importance of this tomb for its lichens into perspective. It is therefore strongly advised that the limestone blocks at the base of the tomb and the limestone capping lid should not be cleaned or the lichens compromised in any way. This is now the advice given by conservation bodies such as English Heritage, Natural England, the National Trust and, of course, by The British Lichen Society when dealing with similar structures. This advice partly stems from a need to protect all aspects of the natural world but also from the realization that a "patina" of hardened, more resistant surface layer of stone is built up over many years by exposure to the atmosphere and that removal of lichens will disrupt this layer and leave the monument more susceptible to erosion by weathering. There is also good scientific evidence that a covering of lichens protects stone surfaces from frost action.

Summary
The ecology of the tomb, particularly its lichen cover, is important not only to the wildlife of the churchyard but also to the natural history of the county—there are few memorials in Worcestershire which support this richness and diversity of species. Aesthetically the tomb enhances the entrance to the churchyard and endows it with a quiet charm and stature, and the lichens covering the stone do much to contribute to this effect. Any interference with its present integrity needs to be thought about very carefully if it is not to create something harsh and discordant at the entrance to this lovely area of tranquility and peace.
It is easy to destroy three centuries of ecological continuity, impossible to recreate it again, and I am certain that John Martin, a farmer close to the natural beauty of the Worcestershire countryside, would be in agreement if he could speak today.
Ivan Pedley July 2013

A very positive response to Ivan's report was made by the PCC at a subsequent meeting, recommending that the lichens on the lid and base of the tomb should not be touched. Conservation work is due to start in September.

This is an example of the important work the BLS Diocesan representatives do on behalf of the lichens in churchyards. We applaud the thoughtful insight of the Secretary of the St Andrew's PCC and our grateful thanks are extended to Ivan and Eluned for their very professional response to this enquiry, and congratulations to them on the success of their efforts.

Ishpi Blatchley on behalf of the Churchyard Sub-committee
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Three lichen records with one stone

Attending the Gloucestershire Lichen Group, which JB organises, has been quite amazing in terms of the lichens that have turned up. Earlier this year we visited the delightful Slad Valley to visit Snows Farm, a Gloucestershire Wildlife Trust reserve. First impression was of a typical old farmland site which is affected by heavy nitrogen pollution and only nitrogen-tolerant species would be found, There were few really old trees and scarcely any rock habitats, a few stones in the very shaded stream and a broken down wall or two. Jill Lang spotted a dark coloured crust on a bit of sandstone in the stream and it looked as though it would turn out to be *Verrucaria aquatilis*. DH was lucky to be given some to take home and when sectioned the perithecia revealed it was *Thelidium pluvium*, a new county record. So even if the lichens might seem rather boring, you never know what you are going to find.

Last year we also visited the Slad Valley, but to Swifts Hill which is a dome-like hill covered with smooth herb-rich grassland and trees round the edge. Also in it there is a long disused quarry for oolitic limestone. Well, we went straight for the quarry where DH got on his knees and crawled around (as you do) and found a small stone about the size of two small fists. Looking at it through his Lichen Candelaris he could see a little *Collema*-type thallus and black dots – hmmm! - have to use a microscope. Well as you can imagine the stone went in the bag - a bit big but not too heavy. Later looking at the material collected at home, picking across the stone under the dissecting microscope there as bold as brass was *Leptogium diffractum*! Too small to be sure in the field with hand lens. Digging out the dots revealed apothecia of *Lecidea lichenicola*, a species which is best known on chalk from East Anglia etc. and really almost certainly a species of *Trapelia*. Then wow! *Thelidium fontigenum*. These three species ALL turned out to be new vice-county records AND all on one small stone. Cosying up on the stone with these illustrious species were the more prosaic *Collema crispum* and *Verrucaria muralis*. We know we are supposed to keep voucher specimens of new VC records but, feeling conservation minded, how could one make individual specimens by smashing up this extraordinary stone! Anyway to cut the story short JB returned it later to exactly the same place in the grass where it can continue to play host to interesting lichens. Let's hope they survive and maybe are joined by others.

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Reflecting upon some *Cladonia* moments

I first became aware of lichens in the spring of 1963. Every school day I passed some small rock outcrops in the school grounds studded here and there with goblet-shaped bodies that my biology teacher, John Chapman immediately recognised as a lichen. A thumb through the Observer' Book soon revealed a close match to *Cladonia chlorophaea*. John is a good all-round biologist and without his input my interest in lichens may well have waned. He was also instrumental in arranging informal expeditions to far-flung parts of the British Isles. The first in 1964 was to Handa Island in the Highlands where research indicated that no lichen surveys had been undertaken. Armed with the Observer's Book and a copy of Dahl's Keys- little else was available at the time- I spent a couple of weeks collecting and examining the Handa lichens. Needless to say, little of the flora was familiar to me though I did manage to map *Cladonia portentosa* on the island and make a modest list of maritime species that included ubiquitous *Ramalina siliquosa* and *Xanthoria parietina*, while other boys were bird-watching (Paul Derrick) or studying the seaweeds (Brian Coppins).

Tunbridge Wells Technical School for Boys, as it was then called had good laboratory facilities and in 1966, myself and Eric Jenner, the proud owner of an MG Magnet visited the nearby Broadwater Forest and discovered large patches of *Cladonia portentosa*. Having read that lichens were effective sinks for radionuclides, we collected a large bagful and ashed it in the lab. We were amazed to find how little of the lichen survived this procedure, and application of a Geiger counter to the residue failed to reveal any radioactivity above that of the local background. It was about this time that Brian became seriously interested in lichens and we made a series of surreptitious field trips in Eric's or Barry's car during the free school periods.

In 1967, four of us (Brian, Eric, Barry Richardson and myself) made plans for a lichen expedition to Ireland between finishing school and starting college. The school PTA even gave us a grant of £20 towards the trip, a considerable sum at the time. During this year pupils were also invited to participate in projects for the school open day. Pupils could put on displays of their work for the benefit of their peers, particularly the school governors. Another attempt was made to combine a bit of lichenology with some physics. Some *Cladonia* podetia were moistened and then loaded with a range of masses to estimate the bending moment and Young's modulus. Upon reflection the display appeared more like exhibitionism than useful science, although it did eventually prove to have been useful. In the 1980's I used a similar technique to measure the force exerted by a gliding blue-green bacterium and more recently a related method looks like a promising approach to tackle some problems associated with the structure of Charophtye algae. With a bit more thought, the method might be applied to the development of lichen swards and morphology.

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Ash Survey

The BLS has joined with the Botanical Society of Britain and Ireland (BSBI) and the British Bryological Society (BBS) to survey the ground flora, lichens and bryophytes associated with ash trees. This is intended to be a baseline survey that can be repeated every ten years or so to monitor the effects of Chalara Ash Dieback and other tree diseases.

The project is being coordinated by the Centre for Ecology and Hydrology, and is to start this winter and continue for the next two years. Sampling will be based on 1km squares, each selected to include both ash woodland and hedgerow or parkland ash. For comparison we will also record the lichens on hardwood trees other than ash in similar situations within the same square. The bryologists will be recording the mosses and liverworts, and the botanists will record the ground flora. We will all work to a simple structured method to ensure that our data can be combined for analysis.

The results of this survey should tell us a lot about the role of ash as a lichen substrate across Britain. The best sites are often intensively studied, but we have much less information on the more ordinary woodlands and hedgerows that cover much of Britain. Random sampling should ensure that we cover the full range of habitats, from the lush woodlands of the oceanic west to the dry and polluted hedgerows of the east of England. All the lichen records will go into the BLS database and they should fill some gaps in the distribution maps there as well.

We need people to help with this survey, so do get involved even if you can only spare a day or two to do your local woodlands. Further information and contact details are on the BLS website.

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The New Zealand Antarctic Medal awarded to Allan Green

In the Queen's Birthday Honours list, New Zealand, June 2013, Her Majesty The Queen has awarded the New Zealand Antarctic Medal for Professor Dr. Allan Green in recognition of his services to Antarctic Science.

"The New Zealand Antarctic Medal may be awarded to those New Zealanders and other persons who either individually or as members of a New Zealand programme in the Antarctic region have made an outstanding contribution to exploration, scientific research, conservation, environmental protection, or knowledge of the Antarctic region."

Allan Green was a Professor at University of Waikato, Hamilton, New Zealand, where his research speciality was gas exchange of lower plants, especially of lichens. He founded the Waikato University Antarctic Terrestrial Research Group, now the largest in New Zealand.

He is an internationally known researcher and expert on Antarctic terrestrial ecosystems specialising in the performance of cryptogams (lichens and mosses) in extreme environments. He has published over 60 papers from his Antarctic research, as well as numerous presentations at international and local conferences.

He has led or co-ordinated 18 Antarctic field events which were mainly to sites in the Ross Sea region, especially Botany Bay, so named by Scott´s Western Party because of the abundance of plant life. Most of the field events involved extensive collaboration with scientists from other countries, such as Germany, Australia, Austria and Spain.

Left: Citation for the New Zealand Antarctic Medal (NZAM). Right: Allan Green in the Dry Valleys of Antarctica.

He was also Principal Investigator for the 3-year International Polar Year Programme - *Understanding, valuing and protecting Antarctica's unique terrestrial ecosystems: Predicting biocomplexity in Dry Valley ecosystems*.

Some particularly interesting research results of Allan Green together with his co-workers are:

- Discovery of probable relict lichen species at Mt. Kyffin, 84°S, which suggest survival from before the latest formation of the Western Antarctic ice Sheet.
- First in field continuous measurements of lichen and moss activity using chlorophyll fluorescence in Southern Victoria Land.
- First estimates of lichen growth rates in Ross Sea Region which turned out to be the lowest growth rates for lichens in the world measured on samples in Taylor Valley. Photographic sites were established in 1980 and growth analysed using a new technique, nano-GIS.

Allan Green is now a researcher at Universidad Complutense, Madrid, Spain, Antarctic research group and has participated in field events to the Maritime Antarctic and Tierra del Fuego as well as being Spanish PI for the European Biodiversa funded SCIN (Soil Crust InterNational) project led by Prof. Burkhard Buedel at Kaiserslautern University, Germany.

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British Isles List of Lichens and Lichenicolous Fungi

September 2013 update to list

The fully corrected list is available on the BLS web site, www.britishlichensociety.org.uk

We are indebted to Peter Crittenden, Paul Diederich and Alan Orange, and other checklist users, for bringing several of the required changes to our notice. Anyone encountering difficulties or errors regarding nomenclature or BLS code numbers, please contact one of us, as below.

E-mail contacts (with main responsibilities):
Brian Coppins (nomenclature, BLS and NBN species dictionaries, spelling, authorities, dates of publication) lichensEL@btinternet.com
Mark Seaward (allocation of BLS numbers and abbreviations) m.r.d.seaward@bradford.ac.uk
Janet Simkin (Recorder and spread-sheet species dictionaries) janetsimkin@btinternet.com

Add:			Notes
2625	*Aspicilia zonata*	Aspi zona	
2617	*Cladophialophora parmeliae #*	Cladoph parm #	
2622	*Dirina fallax*	Dirina fall	
2623	*Lecanora impudens*	Lecanora impu	
2620	*Leptogium magnussonii*	Leptogium magn	
2627	*Leucogyrophana lichenicola #*	Leucogyro lich #	
2615	*Tremella ramalinae #*	Tremel rama #	
2626	*Verrucaria consociata*	Verrucar cons	
2616	*Verrucaria nodosa*	Verrucar nodo	
2621	*Verrucaria squamulosa*	Verrucar squa	
2624	*Verrucaria sphaerospora*	Verrucar spha	

Change of genus (sometimes also species epithet):						
Change from:			Replace with:			Notes
328	*Melanelia commixta*	Melanelia comm	328	*Cetrariella commixta*	Cetrariel comm	
1075	*Pertusaria hemisphaerica*	Pert hemi	1075	*Varicellaria hemisphaerica*	Vari hemi	
1077	*Pertusaria lactea*	Pert lactea	1077	*Varicellaria lactea*	Vari lactea	
1096	*Pertusaria velata*	Pert vela	1096	*Varicellaria velata*	Vari vela	
2291	*Sclerococcum normandinae #*	Sclerococ norm #	2291	*Cladophialophora normandinae #*	Cladoph norm #	

1429	*Toninia tumidula*	Toni tumi	1429	*Porpidinia tumidula*	Porpidinia tumi	

Change of epithet:						
Change from:			Replace with:			Notes
1292	*Amandinea lecideina*	Amand leci	1292	*Amandinea pelidna*	Amand peli	
401	*Cladonia metacorallifera*	Clad meta	401	*Cladonia straminea*	Clad stram	
1496	*Verrucaria hydrela*	Verrucar hydr	1496	*Verrucaria hydrophila*	Verrucar hydr	

Corrected spelling						
Change from:			Replace with:			Notes
236	*Caloplaca arnoldii* subsp. *obliterata*	Calo arnol	236	*Caloplaca arnoldii* subsp. *oblitterata*	Calo arnol	
2297	*Endococcus verrucosporus* #	Endococ verrucosp #	2297	*Endococcus verrucisporus* #	Endococ verrucisp #	
2102	*Lichenostigma elongata* #	Lichenostigma elon #	2102	*Lichenostigma elongatum* #	Lichenostig elon #	
2104	*Lichenostigma rugosa* #	Lichenostigma rugo #	2104	*Lichenostigma rugosum* #	Lichenostigma rugo #	

B.J. Coppins, M.R.D. Seaward & J. Simkin

Literature pertaining to British Lichens – 53

Lichenologist **45**(3) was published on 6 May 2013, **45**(4) on 22 June 2013, and **45**(5) 23 August 2013.

Taxa prefixed by * are additions to the checklists of lichens and lichenicolous fungi for Britain and Ireland. Aside comments in square brackets are by the author of this compilation.

AHTI, T., & STENROOS, S. 2012. New data on nomenclature, taxonomy and distribution of some species of the lichen genus *Cladonia*. *Botanica Complutensis* **36:** 31–34. The name *Cladonia* diversa is validated as *Cladonia diversa* Asperges ex S. Stenroos (2012). They also report *C. angustiloba*, originally described from

Macaronesia, from the Faeroes, so it should be looked for in western British Isles – it resembles *C. foliacea*, but has much narrower lobes.

ARCADIA, L. 2013. *Usnea dasopoga*, a name to be reinstated for *U. filipendula,* and its orthography. *Taxon* **62:** 604–605. The correct spelling of the recently re-introduced *U. dasypoga*, for *U. filipendula*, is shown to be *U. dasopoga*.

BLATCHLEY, I. 2013. In "Reports of outdoor meetings 2012". *Bull. Kent Field Club* **58:** 23–55: Cowden Church (pp. 24–25).

DIVAKAR, P.K., DEL-PRADO, R., LUMBSCH, H.T., WEDIN, M., ESSLINGER, T.L., LEAVITT, S.D. & CRESPO, A. 2012. Diversification of the newly recognized lichen-forming fungal lineage *Montanelia* (Parmeliaceae, Ascomycota) and its relation to key geological and climatic events. *American Journal of Botany* **99:** 2014–2026. The genus *Montanelia* Divakar, A. Crespo, Wedin & Essl. is newly describe to accommodate *M. disjuncta* Divakar, A. Crespo, Wedin & Essl. (syn. *Melanelia disjuncta*) and its relatives.

KITAURA, M.J. & MARCELLI, M.P. 2013. A revision of *Leptogium* species with spherical-celled hairs (*Mallotium* p.p.). *Bryologist* **116:** 15–27. Includes anatomical photos. Two British species are involved: *L. burgessii* and *L. hibernicum*.

LÜCKING, R. & BREUSS, O. 2012. A new species of *Thelotrema*, a new combination, *Leucodecton isidioides*, and a key to thelotremoid lichens of Macaronesia (lichenised *Ascomycota: Graphidaceae*). *Österreiche Zeitschrift für Pilzkunde* **21:** 127–133. *Thelotrema isidioides* is transferred to *Leucodecton* A. Massal. (1860) as *L. isidioides* (Borrer) Lücking & Breuss.

ORANGE, A. 2013. Four new species of *Verrucaria* (*Verrucariaceae*, lichenized Ascomycota) from freshwater habitats in Europe. *Lichenologist* **45:** 305–322. The four species are: *V. hydrophila* Orange (syn.: *V. hydrela* auct.; *V. denudata* Zsch., non Nyl.); *V. nodosa* Orange; *V. placida* Orange and *V. rosula* Orange. *Verrucaria laevata* Ach. is regarded as a *nomen dubium*.

OTÁLORA, M.A.G. & WEDIN, M. 2013. *Collema fasciculare* belongs in *Arctomiaceae*. *Lichenologist* **45:** 295–304. *Collema fasciculare* is transferred to *Arctomia* as *A. fascicularis* (L.) Otálora & Wedin.

PALMER, K. 2013. Lichen Report 2012. *Bull. Kent Field Club* **58:** 66–67. A summary of the notable finds during the year, and notes on the increase of *Candelaria concolor* and *Parmotrema perlatum* and of rare species such as *Anaptychia ciliaris* and *Caloplaca cirrochroa*.

PALMER, K. 2013. In "Reports of outdoor meetings 2012". *Bull. Kent Field Club* **58:** 23–55: Scotney Castle (p. 53), a single thallus *Anaptychia ciliaris* is persisting on a *Juglans nigra* on the Sussex side of the border.

PARNMEN, S., LÜCKING, R. & LUMBSCH, T. 2012. Phylogenetic classification at generic level in the absence of distinct phylogenetic patterns of phenotypical variation: A case study in *Graphidaceae* (Ascomycota). *PLoS One* 7(12): e51392 [p. 13 of article]; published online. The new genus *Crutarndina* Parnmen, Lücking & Lumbsch is introduced for *Thelotrema petractoides* as *C. petractoides* (P.M. Jørg. & Brodo) Parnmen, Lücking & Lumbsch. The genus differs from

Thelotrema s. str. in having a star-like multi-layered exciple. It is named in honour of Peter Crittenden. The name Crittenden is derived from the old British and Welsh and means "the cot on the lower hill"; derived from "cru" (cot); "tarn" (lower), and "dun" or "din" (hill).

TEHLER, A., ERTZ, D. & IRESTEDT, M. 2013. The genus *Dirina* (*Roccellaceae*, *Arthoniales*) revisited. *Lichenologist* **45:** 427–471. British material of *Dirina massiliensis* is shown to belong to two species: *D. massiliensis* and *D. fallax* De Not. (1846), the former occurring on calcareous rocks, the latter on acidic rocks. Both species have a sorediate morph, but these are not formally recognized by the authors. The type of *Dirina massiliensis* f. *sorediata* (Müll. Arg.) Tehler is based on material from Socotra and represents the sorediate morph of *D. immersa*. [Hence, if British lichenologists wish to recognise the sorediate morph of *D. massiliensis* for recording purposes, it should be cited as f. *sorediata* auct. brit. Currently, there is no available name for the equivalent sorediate morph of *D. fallax*. The ecological separation of the two species would benefit from DNA testing, especially to include tricky situations, e.g. weakly calcareous basalts, and where there is downwash from calcareous rock or mortar onto acidic rock below.]

THORN, R.G., MALLOCH, D.W. & GINNS, J. 1998. *Leucogyrophana lichenicola* sp. nov., and a comparison with basidiomes and cultures of the similar *Leucogyrophana romellii*. *Canadian Journal* of *Botany* **76:** 686–693. Description of *L. lichenicola*, which has recently been found in Caithness. It grows on or among the decaying bases of species of *Cladonia* subgen. *Cladina*, and is readily identified by its yellow to orange sclerotia, 1–3 mm diam.

B.J. Coppins
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New, Rare and Interesting Lichens

Contributions to this section are always welcome. Submit entries to Chris Hitch, Orchella Lodge, 14, Hawthorn Close, Knodishall, Saxmundham, Suffolk, IP17 1XW, in the form of species, habitat, locality, VC no, VC name, (from 1997, nomenclature to follow that given in the appendix, see BLS *Bulletin* 79, which is based on the Biological Record Centre for instructions for Recorders, ITE, Monks Wood Experimental Station, Abbots Ripton, PE17 2LS, 1974). Grid Ref (GR) (please add letters for the 100km squares to aid BioBase and Recorder 2000, as these are used in the database and on the NBN Gateway), altitude (alt), where applicable in metres (m), date (month and year). NRI records should now include details of what the entry represents, eg specimen in Herb. **E**, Hitch etc., with accession number where applicable, field record or photograph, to allow for future verification if necessary or to aid paper/report writing. Determined/confirmed by, Comments, New to/the, Finally recorder. An authority with date after species is only required when the species is new to the British Isles. Records of lichens listed in the RDB are particularly welcome, even from previously known localities. In the interests of accuracy, the data can be sent to me on e-mail, my address is cjbh.orchldge@freeuk.com, or if not, then typescript. Copy should reach the subeditor at least a fortnight before the deadline for the *Bulletin*. *Please read these instructions carefully*.

New to the British Isles

Aspicilia zonata (Ach.) R. Sant. (1984): on small boulder in unshaded stream, Afon Anafon, Abergwyngregyn, VC 49, Caernarvonshire, GR 23(SH)/6871.7110, May 2013. Herb. A. Orange 21562 (**NMW**). The material is sterile and lacking lichen substances by TLC, but an ITS sequence closely matched sequences from Norway and Sweden. For description see Santesson, *Lichens of Sweden and Norway* (Stockholm): 46 (1984). **BLS No. 2625.** *A.Orange*

Heteroplacidium fusculum (Nyl.) Gueidan & Cl. Roux (1853 and 2007): on *Aspicilia calcarea* on limestone of south-facing cliff, on sea shore above HWM, Sand Point, VC 6 North Somerset, GR 31(ST)/32546.65949, November 2011. Herb D.J. Hill (**NMW**). Determined by A. Orange. The site is on the south side of the Sand Point peninsular where seashore and salt marsh meet. Good population in a small area of about 1 square metre. Nearby, a good population of *Placopyrenium canellum,* also on *A. calcarea.* For description see Gueidan *et al*., *Mycol. Res.* **111**(10): 1159 (2007). **BLS No. 2614.** *D. J. Hill*

Leucogyrophana lichenicola Thorn, Malloch & Ginns (1998). orange sclerotia on decaying bases of *Cladonia* cf. *ciliata,* on blanket bog, The Halsary, VC109, Caithness, GR 39(ND)/195.493, March 2013. Herb. P.D. Crittenden (**E**). Determined by B.J. Coppins. Previously recorded from Fennoscandia and northern Canada, but probably circumpolar. For description see Thorn, Malloch & Ginns in *Canadian Journal of Botany* **76:** 686-693 (1998). **BLS No. 2627**.

Verrucaria consociata Serv. (1951): on shaded stone in stream in woodland, Afon Tuen, south of Penrhiw, Ystumtuen, VC 46, Cardiganshire, GR 22(SN)/357.400, 21 May 2010. Herb A. Orange 18878 (**NMW**). Thallus thin, minutely granular, composed of goniocyst-like units; perithecia small, *c.* 200 µm diameter, prominent (or partly covered by thallus), with the involucrellum more or less absent, ascospores medium-sized, *c.* 20-27 µm long. Probably widespread. For description see Věstník, *Královské České Společnosti Nauk.* Třída Matematicko-Přírodovědná **4**: 1–7 (1951). **BLS No. 2626.** A. Orange

Verrucaria sphaerospora Anzi (1860): on roof, Barford House, Enmore, VC 5, South Somerset, GR 31(ST)/23.35, October 2012. Herb. Powell 2705. Distinguished by its knobbly areolate to subsquamulose thallus, mostly immersed perithecia with an involucrellum that completely encloses the excipulum, and ascospores that are globose to subglobose, *ca* 10-12 x 8-10 µm. For full description and colour habit photo see the recent monograph of *Verrucaria s. lat.*, in Poland by Krzewicka, in *Polish Botanical Studies* **27:** 94-96 (2012). **BLS No. 2624.** *B.J. Coppins & M. Powell*

Other Records

Agonimia allobata: on three old *Fraxinus* in *Fraxinus – Corylus* pasture woodland, Glenkinnon Burn, Glenkinnon Burn SSSI, VC79, Selkirkshire, GR 36(NT)/4315.3442, 36(NT)/4312.3443, 36(NT)/4310.3440 and 36(NT)/4312.3444, alt 150 m, May 2013. Herb. Sanderson 1942. New to southeast Scotland.
N.A. Sanderson

Agonimia gelatinosa: on small patches of stable soil between moss mats in closely rabbit-grazed grassland on the bottom of a chalk pit, created in the 1940s, Micheldever Oil Terminal, VC 12, North Hampshire, GR 41(SU)/519.435, alt 135 m, September 2013. Herb, Sanderson 1946. First record of *Agonimia gelatinosa* s. str. for Hampshire. Records off the chalk have proved to be *Agonimia globulifera* so far. There are, however, other records of *Agonimia gelatinosa s. lat*. on the Hampshire chalk, which require following up. *N.A. Sanderson*

Anaptychia cilaris: on ironstone headstone in churchyard, Church Stowe, VC 32, Northamptonshire, GR 42(SP)/638.576, October 1981. Herb Laundon 3111 (**BM**). This lichen, rare in Northamptonshire, was still present on an illegible thick headstone in this churchyard, October 2012. The lichen was covering most of the upper part of the stone in two patches, one 55 x 20 cm and the other 17 x 16 cm. This important record demonstrates a continuum of this rare species on the same headstone for a period of at least 31 years. *J.R. Laundon*

Arthonia graphidicola: on *Graphis scripta* on trunk of *Fraxinus excelsior*, on steep, bouldery slope in Lobarion-rich under-cliff woodland, Cwm Bach, Tremadog, VC 49, Caernarvonshire, GR 23(SH)/562.407, alt 140 m, July 2013. Herb SPC. New to the Vice-county and second of this species for Wales.
S.P. Chambers & C.M. Forster-Brown

Bacidia laurocerasi: on lower trunk of young *Fraxinus excelsior*, Cow Lane Pits, VC 31, Huntingdonshire, GR 52(TL)/26.71, August 2013. Herb. Powell 3288. This occurrence was nearly overlooked among the numerous thalli of *Lecidella elaeochroma,* also present on the same bole. New to the Vice-county. *M. Powell*

Baeomyces carneus: on side of a water-splashed stream boulder, Afon Gennog, below Cwm Glas Mawr, Llanberis Pass, VC 49, Caernarvonshire, GR 23(SH)/621.566, alt 250 m, August 2013. Herb. SPC. Apothecial initials present on one sub-fertile thallus. *B.carneus* could perhaps be overlooked in cold riparian habitats in montane regions. New to the Vice-county and second record of this species for Wales.
S.P. Chambers & C.M. Forster-Brown

Biatora globulosa: on bark & lignum on ancient *Fraxinus* by stream in open pasture woodland, Wolf Glen, Glenkinnon Burn SSSI, VC 79, Selkirkshire, GR

36(NT)/4228.3339, alt 200 m, May 2013. Herb. Sanderson 1937. New to southeast Scotland. *N.A. Sanderson* & *B.J. Coppins*

Biatora veteranorum: fertile on lignum on standing *Quercus* and sterile on bark of four old *Quercus*, in open *Quercus*-dominated pasture woodland in ancient parkland, Dalkeith Old Wood, Dalkieth Oakwood SSSI, VC 83, Midlothian, GR36(NT)/3403.6876, 36(NT)/3394.6903, 36(NT)/3352.6890 & 36(NT)/3345.6888, alt *ca* 20–30 m, May 2013. Herb. Sanderson 1941. A new and large population of this Vulnerable RDB species and Scottish Biodiversity Species. *N.A. Sanderson*

Biatorella fossarum: for details, see under *Porocyphus leptogiella*.

Buellia violaceofusca: on dry bark on old *Alnus* by stream in open pasture woodland, Wolf Glen, Glenkinnon Burn SSSI, VC 79, Selkirkshire, GR 36(NT)/4203.3347, alt 200 m, May 2013. Field determination. A new substrate for this rare species, which was also recorded on 10 *Fraxinus* within the upper part of the SSSI. *N.A. Sanderson*

Caloplaca aractina: established colony on hard siliceous boulders near cliff of intrusive microgranodiorite in the mesic- supralittoral, Nant Gwrtheyrn, Lleyn Peninsula, VC 49, Caernarvonshire, GR 23(SH)/348.454, May 2013. Herb. NDC 0085 and (**NMW**) Confirmed by Bryan Edwards. New to Wales. *N.D. Chadwick*

Caloplaca aractina: on dressed serpentine blocks of windmill tower, Windmill Farm, The Lizard, VC 1, West Cornwall, GR 10(SW)/6933.1520, alt 85 m. June 2013. Field determination. An unusual site for this normally maritime lichen, being *ca* 2 km from the sea. *P.W. Lambley*

Caloplaca asserigena: on stems of several *Erica cinerea* bushes in ancient gravel pit in coastal heathland, Headon Warren, Headon Warren & West High Down SSSI, VC 10, Isle of Wight, GR 40(SZ)/3125.8591, alt 120 m, September 2013. Herb, Sanderson 1950. So far this species has proved to be a specialist of twigs of low shrubs in coastal heath and salt marsh in the lowlands and should be looked for in other areas in this habitat. New to the Vice-county and third record of this species for lowland England. *N.A. Sanderson*, Isle of Wight & Wessex Lichen Groups

Chaenotheca brachypoda: on two old *Fraxinus* by stream in open pasture woodland, Wolf Glen, Glenkinnon Burn SSSI, VC79, Selkirkshire, GR 36(NT)/4169.3333 & 36(NT)/4168.3332, alt 230 m. Field determination. New to the Vice-county. *N.A. Sanderson* & *B.J. Coppins*

Chaenotheca chlorella: on lignum inside hollow *Prunus avium*, in policy created within former *Fraxinus–Corylus* pasture woodland, Glenkinnon Burn, Glenkinnon Burn SSSI, VC 79, Selkirkshire, GR 36(NT)/4341.3469, alt 130 m, May 2013. Field determination. New to southeast Scotland. *N.A. Sanderson*

Chaenotheca hispidula: on lignum on old *Alnus*, in open pasture woodland on floodplain, Glenkinnon Burn, Glenkinnon Burn SSSI, VC 79, Selkirkshire, GR 36(NT)/4263.3403, alt 160 m, May 2013. Field determination. New to the Vice-county. *N.A. Sanderson*

Cladonia borealis: on humus, in open short grazed humid heath, Red Hill, New Forest SSSI, VC 11, South. Hampshire, GR 41(SU)/2781.0222, alt 3 m, September 2013. Herb. Sanderson 1947 (**BM**). Identification confirmed by TLC by H. Thüs, with barbatic acid & usnic acid detected. Although regarded as an upland species in the United Kingdom, it is known from high quality lichen rich heathland in the Netherlands, so its occurrence in lowland England is not so surprising. There are some characters that can be used to point to potential records in the field. As well as flattened granules inside the cups, shared with *Cladonia coccifera s. str*., the thallus has a bluish tinge compared to the typically yellow tinge of *Cladonia coccifera s. lat.*. Also the undersides of the squamules are smooth as opposed to the generally archnoid/sorediate undersides of *Cladonia coccifera s. lat.* This is only a beginning, as other material resembling *C. borealis* collected from the New Forest has been found to have usnic acid, porphyrilic acid and zeorin by TLC and therefore may be *Cladonia coccifera s. str*. First modern record of this species for England and lowland England.
N. A. Sanderson

Cladonia cariosa: on old filter beds of waterworks, Norwich. VC 27, East Norfolk, GR TG(63)/211.096. July 2013. Herb. R. Ellis. Confirmed by P. W. Lambley. New to the Vice-county. *P.W. Lambley*

Cladonia phyllophora: on humus on shingle in lichen rich coastal heath, Browndown SSSI, Gosport, VC 11, South Hampshire, GR 40(SZ)/5725.9934, 40(SZ)/5734.9930, 40(SZ)/5751.9931, 40(SZ)/5773.9932 and 40(SZ)/5764.9939, alt 3 m, September 2013. Herb Sanderson 1950. This species appears to be a feature of high quality lichen heath in at least parts of the lowlands and should be searched for elsewhere. New to the Vice-county outside the New Forest. *N. A. Sanderson*

Cladonia rei: in open heath, on stabilised dunes of both the first and second ridges, Studland Heath, Studland & Godlingston Heaths SSSI, VC 9, Dorset, GR 40(SZ)/0392.8580 and 40(SZ)/0350.8529, alt. 5m, June 2013. Herb. Sanderson 1955. New to the Vice-county. *N.A. Sanderson* & Wessex Lichen Group

Cladonia rei: on humus in canopy gaps in heath in coastal heathland, Headon Warren, Headon Warren & West High Down SSSI, VC 10, Isle of Wight, GR 40(SZ)/3140.8598, alt 115 m, September 2013. Herb, Sanderson 1952. New to the Vice-county. *N.A. Sanderson*, Isle of Wight & Wessex Lichen Groups

Degelia ligulata: small population overgrowing moss, soil and rock in sheltered crevices of coastal schist northeast of Porth Towyn, Lleyn Peninsula, VC 49, Caernarvonshire, GR 23(SH)/237.386, Aug 2013. Field determination. New to North Wales. *N.D. Chadwick*

Elixia flexella: on lignum of isolated standing dead *Pinus sylvestris*, in heathland valley, Duckhole Bog, New Forest SSSI, VC 11, South Hampshire, GR 41(SU)/2563.0255, alt 40 m, September 2013. Herb Sanderson, 1945. A surprising record for a species previously only recorded from native woodland in the Scottish Highlands (a record in the FRDBI, based on an 1867 painting of a fungi on *Corylus* chippings is highly unlikely to be correct). It is possible it occurs as a native species on *Quercus* dead wood in the south and should be searched for in this habitat, but otherwise the species must be a relatively recent arrival, since documentary evidence confirms that *Pinus sylvestris* was first planted in the New Forest area in the 1790s. During investigations of this species, it was found that in specimens from both New Forest and Abernethy Forest, the latter previously identified by Brian Coppins, the hymenium reacted I+ pale blue then deep rusty red, not solely I+ pale blue. This correlates with a recent observation for *Elixia cretica* and may actually be typical of the genus as a whole. Further details of this collection can be found at *http://wessexlichengroup.org/Previous_Meetings/2013_Meetings/Holm–Hill_2013/holm_hill_addendum_/*. New to England. *N.A. Sanderson* & *A.M. Cross*

Fellhanera bouteillei: on stem and dead leaves of a C*alluna* bush in coastal heathland, Headon Warren, Headon Warren & West High Down SSSI, VC 10, Isle of Wight, GR 40(SZ)/3140.8598, alt 115 m, September 2013. Herb, Sanderson 1951. New to the Vice-county. *N.A. Sanderson*, Isle of Wight & Wessex Lichen Groups

Lecania subfuscula: on guano-enriched turf on edge of sea-cliff above steep gully, north side of Cardigan Island, VC 46, Cardiganshire, GR 22(SN)/160.517, alt *c*. 30 m, May 2013. Herb. SPC. Seemingly new for Wales, but likely to occur on the Pembrokeshire bird islands. *S.P. Chambers*

Lecanora semipallida: on limestone boulder on south-facing grassy slope, Fry's Hill, Axbridge, VC 6, North Somerset, GR 31(ST)/43-55-, alt 150 m, December 2011. One apothecium sequenced by Steven Leavitt at Chicago Field Museum. New to the Vice-county and the Mendip Hills. *D.J. Hill*

Lecidea lichenicola: on stone 10-15 cm diameter embedded in grassland in quarry, Swift's Hill, Slad, VC 33, East Goucestershire, GR 32(SO)/877.067, alt 160 m, May 2012. Identified by D.J. Hill. Stone returned to position for sake of conservation. New to the Vice-county. *J. Bailey and D.J. Hill*

Leptogium biatorinum: on soil in very short grazed grassland over sandy soil at *Biatorella fossarum* site, Ham Hill, Stoke sub Hamdon, VC 5, South Somerset, GR 31(ST)/477.171, alt 20 m, September 2011. Herb. D.J. Hill. Identified by B.J. Coppins. New to the Vice-county. *D.J. Hill*

Leptogium biatorinum: on compacted sandy soil of path, Cow Lane Pits, VC 31, Huntingdonshire, GR 52(TL)/26.71, August 2013. Herb. Powell 3280. Confirmed by B. J. Coppins. New to the Vice-county. *M. Powell*

Leptogium diffractum: on stone 10-15 cm diameter embedded in grassland in quarry, Swift's Hill, Slad, VC 33, East Goucestershire GR 32(SO)/877.067, alt 160 m 8 May 2012. Identified by D.J. Hill. Stone returned to position for sake of conservation. New to the Vice-county. *J. Bailey and D.J. Hill*

Leptogium tenuissimum: on sandy soil near base of slope of Sandy Heath Quarry, VC 30, Bedfordshire, GR 52(TL)/20-49-, July 2013. Herb. Powell 3080. Confirmed by B.J. Coppins. New to the Vice-county. *M. Powell*

Micarea globulosella: lignicolous, on rail of old wooden gate at entrance to Bull Pit, Lenham Heath, VC 15, East Kent, GR 51(TQ)/91.49, June 2013. Herb. Powell 3075. At the time of collection, it was assumed that it was most likely to be *M.*

denigrata or *M. nitschkeana,* which are essentially identical to *M. globulosella* in the field. New to the Vice-county. *I. Blatchley* & *M. Powell*

Micaria hedlundii: on fallen tree trunk in Yarner Stream valley, Yarner Wood, VC 3, South Devon, GR 20(SX)/784.786, June 2013. Herb. B. Benfield. Confirmed by B.J. Coppins. New to the Vice-county. *B. Benfield*

Micarea misella: lignicolous on rotting ?*Ulex* stem lying loose on floor of Sandy Heath Quarry, VC 30, Bedfordshire, GR 52(TL)/20-49-, July 2013. Herb. Powell 3078. New to the Vice-county. *M. Powell*

Moelleropsis nebulosa: terricolous on trackside spoil bank composed of sand and boulders, Sandy Heath Quarry, VC 30, Bedfordshire, GR 52(TL)/20.49, July 2013. Herb. Powell 3083. Discovered by Catherine Tregaskes. New to the Vice-county.
M. Powell

Myriospora myochroa: on south side of siliceous boulder, Blaen-y-nant, below Cwm Glas Mawr, Llanberis Pass, VC 49, Caernarvonshire, GR 23(SH)/622.567, alt 220 m, August 2013. Herb. SPC. New to the Vice-county.
S.P. Chambers & C.M. Forster-Brown

Normandina acroglypta: on two *Fraxinus* by streams in open pasture woodland, Wolf Glen, Glenkinnon Burn SSSI, VC 79, Selkirkshire, GR 36(NT)/4228.3339 and 36(NT)/4168.3331, alt. 200 m and 220m respectively, May 2013. Field determination. New to the Vice-county. *N.A. Sanderson* & *B.J. Coppins*

Opegrapha rupestris: extremely sparse on *Verrucaria baldensis* on limestone standing stone in the Gorsedd circle (erected 1915) in Aberystwyth Castle grounds, VC 46, Cardiganshire, GR 22(SN)/579.815, alt 30 m, July 2013. Field determination. New to the Vice-county. *S.P. Chambers & D. Martyn*

Pertusaria melanochlora: one patch, *ca* 6 x 2-3cm, on the vertical side of damp, northwest-facing, large streamside boulder, Afon Gennog, below Cwm Glas Mawr, Llanberis Pass, VC 49, Caernarvonshire, GR 23(SH)/621.566, alt 240 m, August 2013. Herb. SPC. Rediscovered in North Wales at the only previously known VC 49 site, a boulder-side colony, which was drowned when reservoir water levels were raised for increased hydroelectric generating capacity. *S.P. Chambers*

Phaeospora parasitica: rare on *Lecanora albescens* on dead whelk shell on unstable shingle between sea and river, North Weir Point, Orford Ness, VC 25, East Suffolk, GR 62(TM)/379.446, alt *ca* 2 m, August 2012. Herb. Hitch C 14. New to the county. *C.J.B. Hitch*

Placopyrenium canellum: for details see under ***Heteroplacidium fusculum***.

Placynthiella dasaea: on bank of ancient gravel pit in lichen-rich parched acid grassland in coastal heathland, Headon Warren, Headon Warren & West High Down SSSI, VC 10, Isle of Wight, GR 40(SZ)/316.859, alt 100 m, September 2013. Field Determination. New to the Vice-county.
N.A. Sanderson, Isle of Wight & Wessex Lichen Groups

Polycoccum pulvinatum: on *Physcia caesia* on stone block fallen from derelict engine house wall, Esgair Hir mine, VC 46, Cardiganshire, GR 22(SN)/733.912, alt 450 m, June 2013. Herb. SPC. New to the Vice-county. *S.P. Chambers* & *A.D. Hale*

Porocyphus leptogiella: on soil in very short grazed grassland over sandy soil, at *Biatorella fossarum* site, Ham Hill, Stoke sub Hamdon, VC 5, South Somerset, GR 31(ST)/477.171, alt 120 m, September 2011. Identified by D.J. Hill, B.J. Coppins and M. Schultz. Herb. D.J. Hill (**BM**). Unusual material in having larger than usual spores and an atypical habitat. This species needs critical study and may be identical with *P. rehmicus.* New to the Vice-county and southwest England. *D.J. Hill*

Porina ahlesiana: on distinctly basic Silurian greywacke face in mid-channel of Afon Peris in sheltered old woodland, Cwm Peris, E of Llan-non, VC 46, Cardiganshire, GR 22(SN)/534.672, alt 70 m, April 2013. Herb. SPC. New to the Vice-county. *S.P. Chambers*

Pyrenidium actinellum *s.lat.*: on *Baeomyces carneus* on side of stream boulder, Afon Gennog, below Cwm Glas Mawr, Llanberis Pass, VC 49, Caernarvonshire, GR 23(SH)/621.566, alt 250 m, August 2013. Herb. SPC. New to the Vice-county and possibly the first British record on this host. *S.P. Chambers & C.M. Forster-Brown*

Ramonia dictyospora: in hollow ancient *Fraxinus* by stream in open pasture woodland, Wolf Glen, Glenkinnon Burn SSSI, VC 79, Selkirkshire, GR 36(NT)/4228.3339, alt. 200 m, May 2013. Herb. Sanderson 1936. New to the Vice-county. *N.A. Sanderson & B.J. Coppins*

Rinodina milvina: *ca* four small poorly developed thalli, below bird perch on outcropping upland siliceous rock step in sheepwalk, north flank of Bryn Rhudd, southeast of Tregaron, VC 46, Cardiganshire, GR 22(SN)/699.562, alt 460 m, July 2013. Herb. SPC. Second Vice-county record for this species and possibly a significantly overlooked species in mid-Wales. *S.P. Chambers*

Scoliciosporum intrusum: on and around the edges of *Rhizocarpon geographicum* thalli, on steeply sloping, east-facing, Ordovician shale outcrop, Drum Peithnant, of Pumlumon Fawr, VC 46, Cardiganshire, GR22(SN)/769.860, alt 480 m, August 2013. Herb. SPC. Second Vice-county and third Welsh record for this species and the first from the Pumlumon district in northeast Cardiganshire. *S.P. Chambers*

Stereocaulon condensatum: three small cushions on burial plot, dressed with a shallow layer of gravelly mine spoil, in graveyard, Llanafan, VC 46, Cardiganshire, GR 22(SN)/684.721, alt 110 m, September 2013. Field determination. An unusual habitat and first churchyard record. The site is only *ca* 0.75 km from the metal-polluted river shingles on the Afon Ystwyth, where *S. condensatum* is locally frequent. *S.P. Chambers & T.A. Lovering*

Teloschistes chrysopthalmus: three thalli on *Prunus spinosa* by estuary, St Clements, near Truro, VC 1, West Cornwall, GR 10(SW)/8548.4448. June 2013. Field determination. Second Vice-county record for this species. First recorded in the Vice-county at Drift Reservoir near Penzance, but now extinct there. *P.W. Lambley*

Teloschistes flavicans; on *Salix* at the edge of clearing, Marsland, Devon Wildlife Trust Reserve, VC 4, North Devon, GR 21(SS)/234.171, May 2013. Field determination. A new site for Devon and new 10 km square record for this species.
T. Holwill & Devon Lichen Group

Thelidium fontigenum: on stone 10-15 cm diameter embedded in grassland in quarry, Swift's Hill, Slad, VC 33, East Goucestershire GR 32(SO)/877.067, alt 160 m, May 2012. Identified by D.J. Hill. Stone returned to position for sake of conservation. New to the Vice-county. *J. Bailey and D.J. Hill*

Thelidium incavatum: on the flat top of short marble headstone in graveyard, Llanafan, VC 46, Cardiganshire, GR22(SN)/684.721, alt 110 m, September 2013. Herb. SPC. New to the Vice-county. *S.P. Chambers*

Usnea esperantiana: one tuft on brightly lit and fully exposed dry lignum of dead, decorticate branch stub of standing dead *Pinus sylvestris* on bog mound, east edge of Cors Fochno (Borth Bog), VC 46, Cardiganshire, GR 22(SN)/639.915, alt *ca* 5 m, June 2013. Herb. SPC. New to the Vice-county. *S.P. Chambers*

Verrucaria ochrostoma: extensive colony on sloping limestone windowsill of Datchworth church, VC 20, Hertfordshire, GR 52(TL)/267.192, May 2013. Herb. Powell 3049. Confirmed by A. Orange. First proven record for the Vice-county.
A. Harris & M. Powell

Verrucaria ochrostoma: on limestone curb, Warboys Cemetery, VC 31, Huntingdonshire, GR 52(TL)/30.79, May 2012. Herb. Powell 2326. New to the Vice-county. *M. Powell & J.F. Skinner*

Verrucaria ochrostoma: on large concrete block, Elms Farm Industrial Estate, VC 30, Bedfordshire, GR 52(TL)/08.51, June 2012. Herb. Powell 2353. One of several known occurrences in Bedfordshire and demonstrating that this species grows on concrete as well as limestone. *M. Powell*

Verrucaria ochrostoma: on concrete construction as part of army installation, Orford Ness, VC 25, East Suffolk GR 62(TM)444.491, June 2013. Herb Hitch D202. Determined by M. Powell. Second Vice-county record for this species.
M. Powell & C.J.B. Hitch

Verrucaria ochrostoma: on concrete retaining wall, The Ciffs, Southend-on-Sea, VC 18, South Essex, GR 51(TQ)/84.86, June 2013. Herb. Powell 2013. Confirmed by A. Orange. New to the county. *M. Powell, P.M. Earland-Bennett, J.F. Skinner & C.J.B. Hitch*

Verrucaria ochrostoma: on concrete of post by windmill, Wicken Fen, VC 29, Cambridgeshire, GR 52(TL)/562.705, July 2013. Herb. Powell 3131. Also well-developed on concrete manhole cover in the National Trust visitor car park (TL564.705). New to the Vice-county. *M. Powell*

Corrigenda

The subeditor is grateful to Mark Seaward for drawing our attention to a typographical error that occurred in BLS Bulletin 112 (Summer 2013). Under the entry for *Verrucaria squamulosa* (**New to the British Isles**), the GR should read 31(ST)/0313.9990 and not 21(ST)/0313.9990, as given.

During a field meeting at Southend-on-Sea, June 2013, it was discovered that the records given in BLS *Bulletin* 112 (Summer 2013) for *Caloplaca ceracea* were incorrectly identified.

British Lichen Society Field Meetings & Workshops Programme 2014

Field Meetings Secretary: Steve Price, Woodlands, Combs Road, Combs, High Peak, Derbyshire SK23 9UP
email fieldmeetings@britishlichensociety.org.uk

*note: **All members** of whatever level of experience are welcomed on **all BLS Field Meetings**. No member should feel inhibited from attending by the fact that some meetings are associated with BLS Council meetings or the AGM. Workshops, on the other hand, may be aimed at members who have some level of experience. If so this fact will be specified in the meeting notice.*
The BLS website **http://www.britishlichensociety.org.uk/** has postings of the meeting notices below and of any updates to them. A .pdf version of this meetings programme is also available for download.

BLS 2014 AGM FIELD OUTING - Calke Park (National Trust)

Sunday 12th January 2014
Local organiser: Steve Price
Following the 2014 BLS AGM to be held at Nottingham University it is planned to visit Calke Park, a National Trust property. This parkland has many veteran trees including oaks thought to be of the same genetic stock as those in Chatsworth Old Park. Details of the meeting place and time will be provided at the AGM.

BRISTOL UNIVERSITY WORKSHOP

Lichen Pycnidia and Conidia and their role in lichen identification
Friday 21 February (evening) – Sunday 23 February 2014
Tutors: Dr Brian J Coppins and Dr David J Hill
Location: University of Bristol Botanic Garden & School of Biological Sciences

This workshop will start at the University of Bristol Botanic Garden (see http://www.bristol.ac.uk/botanic-garden/contact/) Stoke Park Road, Stoke Bishop, Bristol BS9 1JG) at 7.30 pm on Friday 21 February. The Saturday Morning will be spent in the field and from 13.00 on Saturday until 4.30 on Sunday 23 February it will be in Laboratory B80 in the School of Biological Sciences, Woodland Road, Bristol BS8 1UG.

Pyncidia are common features of lichens and they have useful diagnostic features which can greatly help identification. The range and diversity of these features can be quite bewildering and the skills needed to examine them somewhat elusive. The workshop will improve participants' technical and observation skills. We will also have discussions about their function in the biology of lichens. Participants are asked to bring specimens which they can examine and hopefully identify. As the range of species to be found on the field trip will necessarily be limited, more experienced participants are also asked to bring material that has a range of pycnidial and conidial types.

Fee £50.00 (payable to the "British Lichen Society")
If you are interested in attending the workshop please email David Hill (**d.j.hill@bris.ac.uk**) or phone 01761 221587 for further information.

BLS SPRING 2014 MEETING - Beara Peninsula (West Cork) and Killarney

Saturday 26th April 2014 to Saturday 3rd May 2014
Local organiser: Vince Giaravini

The provisional plan, for this meeting in the south west of Ireland, is to focus primarily on under-recorded areas of the Beara peninsula with some exploration of offshore islands; Uragh Wood (the less accessible far end); perhaps also the Killarney Lakes to target the lake margins and assess the islands. The meeting will be based in the village of Glengarriff at the head of Bantry Bay.

Meeting base & accommodation
The meeting will be based in the **Glengarriff Park Hotel**, which has been used before by the local organiser, ten twin-rooms have been pre-booked here. The agreed group rate is 45Euros per person per night B&B in a shared twin room and 65Euros per

person per night B&B for single occupancy. Dinner is an extra 20Euros. These pre-booked rooms will only be held for our group for up to three months before the meeting i.e. 25 January 2014 after which they will be released for public booking and may become unavailable to us.

Hotel details: Glengarriff Park Hotel, The Village, Glengarriff, West Cork, Ireland. tel: +353 (0)27 63000 tel: +353 (0)27 63526 email: info@glengarriffpark,com website: www.glengarriffpark.com

Booking
To stay at the Glengarriff Park Hotel please book directly with the hotel and ask for the British Lichen Society group rate (see above for the agreed tariffs). The hotel will want credit card details as guarantee of your booking. Individuals booking into shared twin accommodation will be allocated to rooms immediately prior to the meeting.

Advise the Field Meetings Secretary, Steve Price, of your intention to attend the meeting and when you have made a booking for accommodation. By email to fieldmeetings@britishlichensociety.org.uk or by post to Woodlands, Combs Rd, Combs, High Peak, Derbyshire SK239UP.

Microscope work
The BLS have reserved a meeting room in the hotel for the duration of the meeting for microscope work, displays and talks.

Travel
By air...various airlines fly to Dublin and Cork from UK airports close to the major conurbations. It is worth shopping around on the net for the best packages and deals.

By sea...head for Holyhead (Anglesey) if travelling by car from Scotland or northern England otherwise drive to Fishguard (Pembrokeshire) for sea-crossings. Both StenaLine and Irishferries websites have details. Allow at least 4 hours from the Irish ports to Glengarriff. Historically gridlocked centres such as Waterford and Cork City are now comfortably by-passed.

Before you go

- Useful maps: OSI Discovery Series (1:50,000) map Nos 84 Cork, Kerry and 85 Cork, Kerry (for the Beara peninsula). These can be obtained through Dash4it.co.uk and other map distributors.
- Useful introductory books to the compelling landscapes of West Cork include *West Cork Walks* by Kevin Corcoran (the O'Brian Press) and *Wild Ireland: a traveller's guide* by Brendan Lehane. Both can be obtained through Amazon.co.uk, BookDepository.co.uk and other book distributors.
- To further whet your appetite for the area also have a look in BLS *Bulletin* 110 (Summer 2012) at the report of the 1996 BLS Field Meeting to Killarney.

BLS MID-SUMMER 2014 MEETING - Iceland (advanced notice)

Summer 2014 (in the late-June / July timeframe)
Local Organisers: Silke Werth, Starri Heiðmarsson & Ólafur Andrésson
BLS Members in Iceland have offered to host a field meeting. It is being organised as a meeting additional to the spring, summer and autumn BLS Field Meetings.
The outline proposal is for the meeting to be based in the area near Borgarnes in SW Iceland, allowing for excursions to the Westfjords, Snaefellsnes, NW Iceland, Reykjanes and the western part of the highlands.

Accommodation will most likely be in a guest house or hotel.

Expressions of interest should be made to the Field Meetings Secretary, Steve Price, email to fieldmeetings@britishlichensociety.org.uk When more details are known they will be sent out to those who have expressed an interest and will also be put onto the BLS website.

BLS SUMMER 2014 MEETING - Southern Lake District

Saturday 30th August 2014 to Saturday 6th September 2014
Local organiser: Allan Pentecost

The varied geology (limestone, sandstone and igneous rock) and the complex of habitats (coast, woods, fells and dales) of this area in the southern Lake District of England offer plenty of scope for a week of lichenological discoveries in this under-recorded area.

Meeting base & accommodation
The meeting will be based in the **Castle Head Field Studies Centre, Grange over Sands, Cumbria**, LA11 6QT Tel: +44 (0)15395 38120 Fax: +44 (0)15395 36662. Note: bookings are to be made though the BLS and not directly with the Centre – see below).
Saturday 30th August - arrive 3.00 – 4.00pm, Saturday 6th September 2014 - depart 9.30am.

Full board accommodation has been reserved for 20 – 25 attendees in shared rooms with some limited single occupancy . At the Centre there is a lounge and a small bar which is operated on an honesty system. Additional Centre information can be found on the website http://www.field-studies-council.org/centres/castlehead

Cost
Accommodation, all meals (dinner, breakfast, packed lunch) and use of a workroom are included in the group price of £284.00 per person including VAT.

Booking

Book though the Field Meetings Secretary, Steve Price, email to fieldmeetings@britishlichensociety.org.uk and not directly with the Centre.
Send a £50 deposit to Steve Price, Woodlands, Combs Rd, Combs, High Peak, Derbyshire SK239UP. Cheques to be made payable to 'The British Lichen Society' (not to 'BLS') please. This £50 is the amount of the per person deposit that the BLS has to pay 6 months prior to the meeting.

The balance of the cost will also have to be paid through the BLS nearer the time of the meeting. Individuals booking shared twin accommodation will be allocated to rooms immediately prior to the meeting.

Microscope work
A workroom has been reserved at the Centre for the duration of the meeting for microscope work, displays and talks.

Travel
Castle Head has excellent road and rail links:
The centre lies only 12 miles from Junction 36 on the M6;
The train station at Grange-over-Sands is only 2 miles from the Centre with good rail connections from both the north and south including Manchester Airport.

BLS AUTUMN 2014 MEETING - Kent

Thursday 16th October (evening) to Monday 20th October 2014 (lunchtime)
Local Organisers - Ishpi Blatchley & Keith Palmer

Although well-populated the county of Kent is blessed with a great diversity of habitats, from the calcareous North Downs to acid heathland and from shingle habitats to extensive parks and woodland. This long weekend will provide many opportunities to sample this diversity. Although there is a long history of lichenologists visiting Kent, in more recent years, apart from churchyards, the county has been somewhat neglected. In the 1960s and 1970s, Francis Rose and Brian Coppins did much work in Kent but huge changes in land management and increased infrastructure have left their mark on the lichen flora. So there is much to be discovered and unique habitats to explore.

Dungeness, the largest area of stabilised shingle in Britain, has an atmosphere all of its own. Covered with *Cladonia* species and foliose lichens usually found on trees, the shingle is interspersed with willow scrub and windswept prostrate blackthorn. Behind the foreland is the low-lying area of Romney Marsh with lovely old churches standing out in the flat landscape, sometimes known as the sixth continent! North wall communities are well represented on these churches which have also produced a scattering of rarities, several within a short distance of our base. Even richer are churches within the Weald of Kent and visits there will be possible too.

It is hoped to visit representatives of typical Kent habitats - ancient woodlands of oak, hornbeam, ash and field maple, orchards (apple, pear and cherry), unimproved medieval deer parks, and old spoil heaps from the Kent coalfield. And, of course, churchyards.

This meeting will provide an opportunity to gather additional records for the proposed Atlas of Kent Lichens.

The meeting will run from 20.30 (after dinner) on Thursday 16th to welocome participant and give an introduction to the area and its habitats and lichens and will conclude at lunchtime on Monday 20th in the field. It will be based at the Dog and Bear Inn in the attractive village of Lenham situated between Ashford and Maidstone. The Dog and Bear (The Square, Lenham, Maidstone ME17 2PG tel 01622 858219 www.dogandbearlenham.co.uk) is a Shepherd Neame pub – the local Faversham brewery.

15 rooms have been booked – 1 single, 10 twins (which have zipped beds so can be doubles), and 4 doubles. The negotiated price for B&B is £60.00 per room/night for single occupancy, £70.00/room/night for a room with 2 occupants. When booking please mention the British Lichen Society.

A Function room suitable for setting up microscopes will be at our disposal from Thursday evening to Sunday evening inclusive. There is ample parking in the Inn's own car park at the rear of the building accessed from Faversham Rd **not** from The Square.

Lenham is easily accessible from the M20/A20. There is also a railway station on the Victoria to Ashford line. Early booking is recommended as other accommodation in Lenham is very limited – There is another hotel with a few rooms and one B&B. There is a large Mercure hotel at Hollingbourne about 4 miles away. Additional accommodation is available in nearby Charing or Harrietsham.

Please notify Ishpi Blatchley and Steve Price, BLS Field Meetings Secretary of your intention to participate in the meeting and if you have booked accommodation in the Dog and Bear. Details of site visits will be sent out to those attending nearer the time of the meeting.

Contact details:
Ishpi Blatchley, 3 Durham Avenue, Bromley, Kent BR2 0QA
email: ishpi.blatchley@gmail.com
Steve Price, Woodlands, Combs Rd, Combs, High Peak SK23 9UP
email: fieldmeetings@britishlichensociety.org.uk

BLS Field Meeting, Kinlochewe 27 April – 4 May 2013

Introduction

Lichens are one of the glories of the north-west highlands patterning the trees, rocks and moors so it is not surprising that this spring meeting drew members from all over the British Isles. Kinlochewe is an ideal base for holding a field meeting as it lies at the junction of a road leading down towards Loch Torridon, north to Gairloch and beyond and south to Achnasheen where there is a station. The eastern flanks of Beinn Eighe tower above the village and across the valley the mountain of Slioch beckons. It is also at the southern end of Loch Maree, which is flanked by rising ground covered in native pine forest on its south-western side and mixed oak woodland on the north-eastern shore. Whilst beyond Torridon, an outcrop of Cambrian limestone supports the northern-most ash wood in Britain.

Beinn Eighe is the largest nature reserve in Britain. It is also the location for the Anancaun Research Centre run by Scottish Natural Heritage. The area has been the base for Oliver Moore's PhD which has been to research the impact of deer on lichen and bryophyte communities. We were therefore very fortunate that Oliver offered to lead this field meeting.

Perhaps by chance or design it happened to be almost 50 years since the BLS last visited Kinlochewe for a week in August 1963, when it followed straight after one at Killin in Perthshire. This meeting was led by Peter James and there is a full account of it in James (1965). In this meeting we revisited some of the sites recorded then including Talladale, Coulin Forest, Rassal ash wood with nearby Allt Mor and Inverewe Gardens. On that occasion 12 members participated.

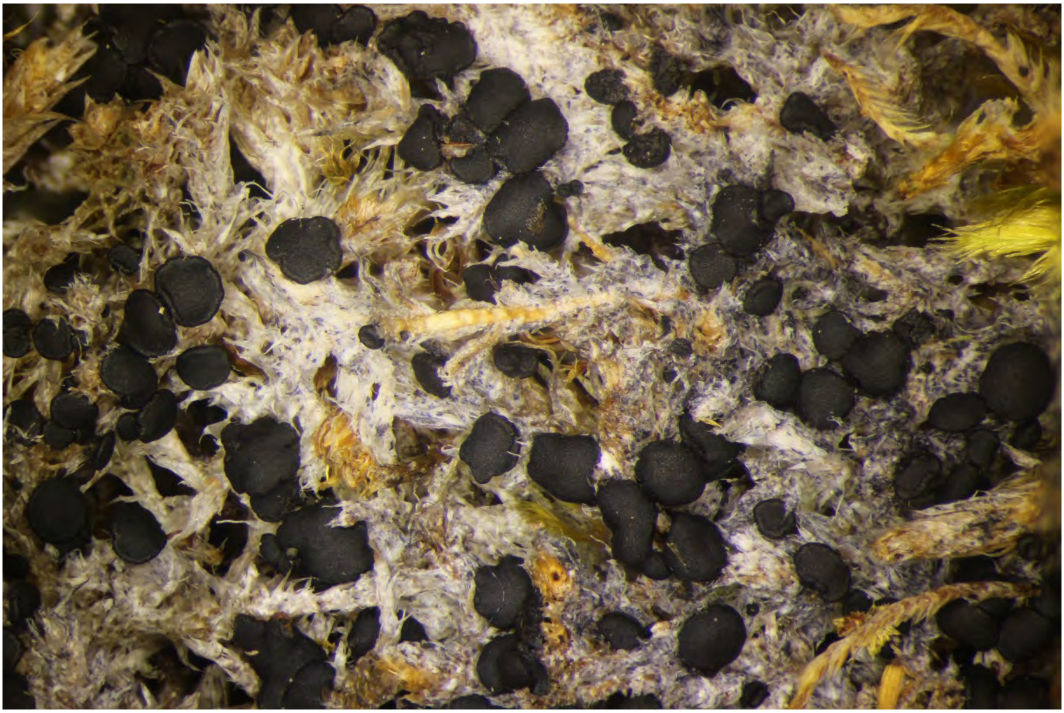
The earlier date meant that we avoided the midges but got snow, gales and heavy rain instead! Though to be fair we did have several dry days. Nevertheless, the extensive drying area at Anancaun was put to good use.

Saturday 27th April

Participants made their way from all over Britain by car, train and in some cases plane to Inverness airport in time for an evening briefing by our leader Oliver at the Anancaun Research Station, which was to be our base for the week. It also gave time for members to set up their microscopes in the very adequate laboratory area. In all 22 people took part in all or some days of the meeting. It was a refreshing mix of the experienced, the improvers and the beginners, a sign that the Society continues to flourish fifty years on from that earlier meeting. Some members stayed at the Research Centre, whilst others rented cottages or stayed in the nearby hotel.

Sunday 28th April Rassal Ash Wood

The weather was not very auspicious as we gathered at Anancaun on our first morning before setting off for Rassal. Curtains of rain and hail blew across Torridon as we drove down the valley whilst above, the snow-capped peaks of Beinn Eighe and Liathach loomed large through the murk. When we arrived at the car park at Rassal we encountered two people with an all-terrain vehicle, which many of us rather envied. There was even a suggestion that the BLS should purchase one, imagine the lichenological discoveries that could then be made in the remoter areas! They turned out to be the owners of the land surrounding Rassal Ash Wood and were out to spend the day counting deer. Still, they were happy for us to explore Allt Mor, a ravine above the wood.



Lecidea hypnorum growing on moribund moss, Rassal Ash Wood

Rassal is the northern-most ash wood in Britain and is developed on a narrow outcrop of the Cambrian Durness limestone, a rarity in an area dominated by the acid Torridon sandstone and Lewisian gneiss.

We started by examining trees close to the road. The ash (*Fraxinus excelsior*) trees were draped with luxuriant growths of *Degelia cyanoloma* and *Lobaria pulmonaria*. As we penetrated further into the wood other delights were discovered including *Lobaria virens*, *L. scrobiculata*, *Sticta sylvatica*, *Gomphillus calycioides, Leptogium brebissonii* and *L. pulvinatum.* Superb cushions of *Leptogium burgessii* were admired and photographed on a horizontal trunk. The combined morphs of *Sticta canariensis/dufourii,* having both the green alga and cyanobacteria, was found on one ash. Steve managed to find *Pseudocyphellaria norvegica* which was a new species to the wood. Limestone rocks supported species such as *Caloplaca flavovirescens*, *Gyalecta jenensis*, *Hymenelia epulotica, H. prevostii* and *Toninia verrucarioides.* As squalls continued to race across the hillsides one gust was strong enough even in the shelter of the wood to blow a member of the party over.

Collema fusconigrescens on a limestone boulder, Rassal Ash Wood

In the afternoon the party aimed for the gorge negotiating the deer fencing and moving up heather-covered slopes with outcrops of limestone rock. Then breaking into smaller groups with some aiming for higher ground above, whilst others bravely descended into the gorge and some explored an old copper mine. In the limestone grassland above, the characteristic species of this habitat, *Solorina saccata* and *Peltigera leucophlebia* were found. As we started to return back to the car park the weather had a sting in its tail with a very heavy hail squall that had us hurrying back to the cars.

Monday 29th April Talladale

This was another day with heavy showers and driving rain and hail, testing weather for lichenology. Still not deterred, the party set off for the Talladale Gorge. We were joined by Brian Coppins and Andy Acton. Brian had wanted to get to the upper parts of the gorge for about 30 years. The intention was to ignore the first one kilometre square and head towards NG9168. This involved some determined hammering to move the bolt on a new deer gate then a very steep climb out of the valley up a deer track. We then walked along the lip of the gorge until we came to the chosen square. The gorge was wooded with birch the commonest tree but occasional elm (*Ulmus procera*), hazel and rowan. Higher up the gorge native Scots pines clung to the edge. The birch trees had a lichens such as *Mycoblastus sanguinarius*, *M. caesius*, *Pertusaria ophthalmiza* and *Parmelia saxatalis*. Further up the gorge, especially nearer the stream, rowan supported *Lobaria pulmonaria*, *L. virens* and *L. scrobiculata* with other members of the Lobarion like *Degelia cyanoloma*, *Sticta fuliginosa* and *Nephroma laevigatum.* Not surprisingly in view of the heavy rainfall and

Bunodophoron melanocatpum on *Betula* bark, Talladale

consequent leaching of the bark, *Hypotrachyna laevigata* was also present. In places there were magnificent growths of *Protopannaria pezizoides* growing on soil or lignum. Other species of interest included *Bacidia auserswaldii, B. carneoglauca, Lecanactis latebrarum, Leptogium cyanescens, Megalaria pulverea* and *Micarea stipitata. Ptychographa xylographoides,* a new species for many was found by Brian on the wood of some fallen trunks.

Lecanactis latebrarum; image © Oliver Moore

The heathland above the gorge supported common species such as *Icmadophila ericetorum* but also the local *Cladonia uncialis* subsp. *uncialis,* which is distinguished from the common *C. uncialis* subsp. *biuncialis* by being markedly cushion-forming and with the ends of the podetia having a star-like appearance.

Tuesday 30th April. Eastern slopes of Meall a' Ghiubhais. Cnoc na Gaoithe above the pinewoods.

Platismatia norvegica growing on an old birch tree, Meall a' Ghiubhais

The weather was better with just one or two light showers. We set off from the Beinn Eighe nature trail car park climbing up the eastern slopes of Meall a' Ghiubhais towards a point where a stream drains from a slope higher up forming a small gorge. Time was spent here examining outcrops of a calcareous rock which supported species such as *Acarospora cervina, Collema auriforme, C. fuscovirens* and *Placynthium nigrum*. A birch tree nearby had *Ochrolechia szatalaënsis, Platismatia norvegica* and on the sheltered underside *Lepraria umbricola*. Some continued up the track to the boulder-strewn plateau above whilst others sat having lunch on a large rock bluff admiring the views over the pine forest and loch and the much nearer *Pilophorus strumaticus*. Afterwards slowly descending by way of old standing dead pines which supported members of the *Caliciales* including *Calicium glaucellum, C. salicinum* together with species of lignum and acid bark such as *Imshaugia aleurites, Lecidea turgidula, Ochrolechia microstictoides* and *Parmeliella hyperoptera*. The uncommon species *Pertusaria borealis* was found on pine.

Wednesday 1st May. Kernsary and the Letterewe Estate.

Rain clouds cleared early and then the sun came out and we were treated to a glorious day exploring the woods and moorland on the north-east side of Loch Maree. These woods are developed on the complex geology of the moine thrust which include some relatively base-rich rocks. It is the most northerly example of a large oak wood in the UK. *Quercus petraea* is dominant but areas on flush soils also support ash, hazel and alder. In the vicinity of Ardlair birch grows with wych elm, aspen, holly and sessile oak. On the heather-covered crags above grow scattered native Scots pine.

We were given permission by the Letterewe Estate to use their roads and tracks, necessary as the area is so remote. We gathered initially at Kernsary where the good road ends and then various members of the party were ferried down to Ardlair by the loch, with some staying behind to work the heather moorland and Lewisian Gneiss outcrops. The rest split into a number of groups to cover as many monad squares as possible around and to the south east of Ardlair.

There was a real feel of exploring new territory as we worked the slopes extending up from the loch. Surprisingly *Lobaria* and *Sticta* species were rather rare, though all four *Lobaria* species were present and the mossy trees did support species like *Catinaria atropurpurea, Degelia atlantica, D. cyanoloma, Fuscopannaria mediterranea, F. sampaiana, Gomphillius calycioides, Leptogium cyanescens, Micarea stipitata, Mycobilimbia epixanthoides, Nephroma laevigata, N. parile, Pachyphiale carneola* and *Parmeliella triptophylla.*

The crags were worth exploring for the views across the loch to the snow-capped Beinn Eighe range. They and isolated boulders supported species such as *Caloplaca flavovirescens, Dermatocarpon intestiniforme* and *D. luridum,*. Rocks by the shore had species such as *Aspicilia laevata, Bacidia inundata* and *Ionaspis lacustris* growing on them.

Thursday 2nd May. Inverewe Estate, Gleann Bianasdail and Lochan Fada.

The weather forecast proved correct and after a dry start to the morning, rain with snow on the higher ground began to fall. It was a bit of a shock when the 'ice alert' warning came on in the car as the temperature fell to 3°C on the road between Kinlochewe and Gairloch. The party split into two main groups with the larger one visiting the woods around Inverewe Gardens. A smaller party, as it turned out rather unwisely, decided to venture up the pass of Gleann Bianasdail beneath the flanks of Slioch hoping to reach a limestone outcrop on the shores of Lochan Fada. As they neared the high point on the pass the rain turned increasingly to snow and at that point Peter and Peder decided to retreat, briefly looking at boulders and heathy ground in the pouring rain and sleet on their return. Graham however was made of stronger stuff and carried on wading a river to reach the limestone outcrop on Lochan Fada with snow accumulating on his back pack and recorded a number of calcicoles including *Collema auriforme*, *Gyalecta jenensis var. jenensis, Placynthium nigrum, Verrucaria baldensis, V. dolosa, V. hochstetteri* and *V. muralis.* Looking at dot maps in the comfort of home it is easy to forget how much effort goes into some squares!

Collema fasciculare (now *Arctomia fascicularis*; see Otálora & Wedin, *Lichenologist* **45**: 295-304, 2013) in the gardens at Inverewe

The party that visited Inverewe Gardens were set the task of recording from a rather un-promising conifer plantation on behalf of the National Trust for Scotland. A handful of mature ash, beech and sycamore trees near the edge of the plantation supported several Lobarion lichens. A clump of *Ramalina lacera* was found on an ash. The amphibious lichens *Verrucaria aquatilis* and *V. praetermissa* were present on rocks in a tiny stream. An old wooden gate in the woods added *Micarea denigrata* to the list. Eventually the group clocked up 101 species by the time the more persistent rain had arrived and lichenology became increasingly difficult.

Friday 3rd May

The final day spent in the field was rather cloudy and cold. Again the party divided into a number of groups. One party climbed up the Beinn Eighe nature trail path to the boulder strewn plateau at about 500m. Others felt the need to see some coastal lichens and went to Red Point. Still others went up to the Inverewe gardens again around Poolewe.

Red Point is a rather exposed area of coastline with peaty moorland extending down to a glorious sandy bay with low rocky outcrops of Torridon Sandstone. Away in the distance the snow capped peaks of northern Harris could be seen. The coastal rocks had the usual suite of maritime species including *Anaptychia runcinata, Caloplaca ceracea, C. marina, Lecanora actophila, L. gangaleoides, Lichina confinis, Ramalina cuspidata, R. siliquosa,* and *Verrucaria maura*. A rather beautiful Lobarion community with *Lobaria pulmonaria*, *L. virens*, *Nephroma laevigata* and *Sticta sylvatica* grew amongst the prostrate heather on the low headland and down into the clefts of the rock. A scramble through a remnant birch woodland added a few epiphytic species to the list. Fence posts along the road supported extra species including *Bryoria fuscescens* and *Tuckermanopsis chlorophylla*. Finally examining concrete gate posts added a few additional species like *Caloplaca polycarpa*, not seen elsewhere on the meeting.

Les and Sue Knight explored the Beinn Eighe nature trail and were thrilled to find one of the more obscure lichens – *Bryophagus gloeocapsa* growing on bryophytes. As the Flora rightly states, it is easily overlooked.

Saturday 4th May

The meeting broke up in the morning and we all said our farewells, leaving with very fond memories of good companionship, beautiful scenery and challenging weather! As many of us took the road to Achnasheen and beyond we passed overnight snow lying by the road. Interestingly about 2 days later Kinlochewe was mentioned in the national weather forecast for having recorded a temperature of 21C – how things can change!!

Acknowledgements

A big thank you to Oliver for all his help in organising this meeting. His local knowledge made a huge difference to its success and also for helpful suggestions with this report. Also thanks to Steve Price who helped as Field Secretary and commented on the account. Thank you also to the various landowners for allowing access to their land and Scottish Natural Heritage for allowing us to use their excellent facilities at Anancaun. Finally to Brian Coppins for working through and checking the records made during the meeting in his usual meticulous way.

Participants

Oliver Moore (leader), Andy Acton, Peder Aspen, Nicola Bacciu, Graham Boswell, Paul Cannon, Heather Colls, Brian Coppins, Ginnie Copsey, Phil Cutt, Paul Harrold, Andrew Hodgkiss, Les Knight, Sue Knight, Peter Lambley, Doug McCutcheon, Heather Paul, Steve Price, Matt Prince, Maxine Putnam, Catherine Tregaskes and Richard Whittet.

Reference

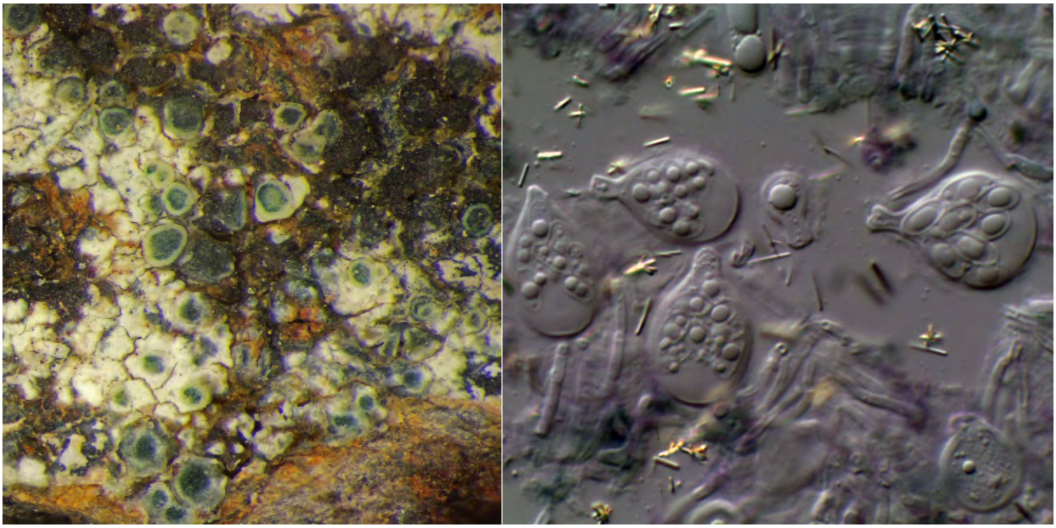
James, P.W. (1965). Field Meeting in Scotland. *Lichenologist* **3**: 155-172.

Peter Lambley
plambley@aol.com

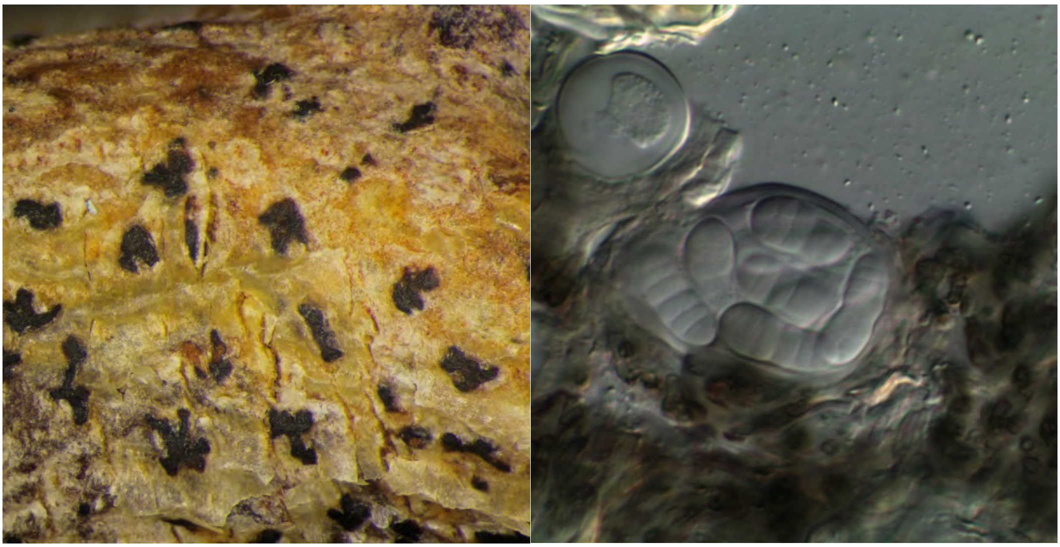
The field meeting leader discovers a dead pine tree…… These are good habitats for many interesting lichens including pinhead species (*Caliciales*), *Imshaugia aleurites*, *Hertelidea botryosa*, *Micarea misella* etc. Photo: Andy Acton.

Imshaugia aleurites on a dead pine tree, Beinn Eighe NNR

Ptychographa xylographoides on a very wet dead fallen tree in Talladale: image Andy Acton



? *Arthrophacopsis* sp., an undescribed parasite of *Lecanora intricata* from the Beinn Eighe reserve. *Arthrophacopsis* is similar to *Arthonia* but has aseptate ascospores. This species has no fruit-body, apparently developing as individual asci within the hymenium of its host lichen. The blue-green coloration of the host ascomata (left image) could be linked to their parasitism.



Arthothelium norvegicum, another *Arthonia*-like lichen from the Beinn Eighe NNR, this time growing on stems of *Calluna vulgaris*. *Arthothelium* species have muriform ascospores, in contrast to those of *Arthonia* species which are transversely septate. This species has paraphysis-like structures with dark pigmented tips, visible in the bottom right of the right-hand image.

List of species	**BEN**	**INV**	**LET**	**RAS**	**RED**	**TAL**
Abrothallus parmeliarum	●					
Acarospora fuscata			●			
Acarospora glaucocarpa	●					
Acrocordia gemmata		●	●	●		
Agonimia tristicula	●					
Amandinea punctata				●		
Anaptychia runcinata		●			●	
Anisomeridium biforme			●			●
Anisomeridium ranunculosporum	●					●
Arctoparmelia incurva	●					
Arthonia fuscopurpurea						●
Arthonia ilicina	●					●
Arthonia leucopellaea	●					●
Arthonia punctiformis		●	●			
Arthonia radiata	●	●	●		●	●
Arthonia stellaris				●		
Arthopyrenia analepta	●	●	●			●
Arthopyrenia carneobrunneola						●
Arthopyrenia cerasi				●		
Arthopyrenia cinereopruinosa				●		
Arthopyrenia punctiformis	●		●	●		●
Arthopyrenia salicis				●		●
Arthothelium norvegicum	●					
Arthrorhaphis aeruginosa				●		●
Arthrorhaphis citrinella	●		●			●
Arthrorhaphis grisea	●					
Aspicilia caesiocinerea			●	●		●
Aspicilia calcarea				●		
Aspicilia cinerea s. lat.	●				●	
Aspicilia grisea	●					
Aspicilia laevata	●	●	●			●
Bacidia auerswaldii						●
Bacidia caesiovirens			●			●
Bacidia carneoglauca						●
Bacidia inundata		●	●			
Bactrospora homalotropa						●
Baeomyces placophyllus	●					

List of species	BEN	INV	LET	RAS	RED	TAL
Baeomyces rufus	●	●	●		●	●
Biatoropsis usnearum						●
Bilimbia lobulata				●		
Bilimbia sabuletorum	●					
Bryophagus gloeocapsa	●					
Bryoria chalybeiformis			●			
Bryoria fuscescens	●	●	●		●	●
Buellia aethalea	●	●	●			
Buellia disciformis	●					●
Buellia erubescens	●					
Buellia griseovirens	●					
Buellia schaereri	●		●			●
Buellia stellulata			●			
Buellia subdisciformis					●	
Bunodophoron melanocarpum	●					●
Calicium glaucellum	●	●	●			●
Calicium salicinum	●					
Calicium viride		●				
Caloplaca cerina var. *cerina*		●				
Caloplaca citrina s. lat.			●			
Caloplaca crenularia			●		●	
Caloplaca ferruginea s. str.	●	●	●	●		●
Caloplaca flavovirescens			●	●		
Caloplaca marina		●			●	
Caloplaca oasis					●	
Caloplaca thallincola		●				
Calvitimela aglaea			●			
Candelariella aurella forma *aurella*					●	
Candelariella vitellina forma *vitellina*			●		●	
Catillaria chalybeia var. *chalybeia*	●					
Catillaria lenticularis	●					
Catinaria atropurpurea	●	●	●			●
Cetraria aculeata	●	●				
Cetraria islandica subsp. *islandica*	●					
Cetraria muricata			●			
Chaenotheca brunneola	●					●
Chaenotheca chrysocephala	●					

List of species	BEN	INV	LET	RAS	RED	TAL
Chaenotheca furfuracea	●					●
Chrysothrix candelaris	●					
Chrysothrix chrysophthalma						●
Chrysothrix flavovirens	●	●				●
Cladonia arbuscula subsp. *squarrosa*	●	●	●			
Cladonia bellidiflora			●			
Cladonia cervicornis subsp. *cervicornis*	●		●		●	
Cladonia cervicornis subsp. *verticillata*		●	●			
Cladonia chlorophaea s. lat.	●		●	●	●	
Cladonia ciliata var. tenuis			●			
Cladonia coccifera s. lat.	●		●			
Cladonia coniocraea	●	●	●	●		●
Cladonia crispata var. *cetrariiformis*	●	●				
Cladonia diversa	●	●	●			●
Cladonia fimbriata	●		●	●		●
Cladonia floerkeana	●		●			●
Cladonia furcata subsp. *furcata*		●	●	●	●	
Cladonia gracilis	●	●				
Cladonia macilenta	●	●	●			●
Cladonia ochrochlora	●					
Cladonia parasitica				●		
Cladonia polydactyla var. *polydactyla*	●	●	●	●		●
Cladonia portentosa	●	●	●	●	●	●
Cladonia pyxidata	●	●	●	●		●
Cladonia ramulosa	●					
Cladonia rangiferina	●					
Cladonia rangiformis		●			●	
Cladonia squamosa s. lat.	●					
Cladonia squamosa var. *squamosa*			●		●	
Cladonia squamosa var. *subsquamosa*	●		●			●
Cladonia strepsilis	●	●	●		●	●
Cladonia subcervicornis	●	●	●		●	●
Cladonia uncialis subsp. *biuncialis*	●	●	●	●	●	●
Cladonia uncialis subsp. *uncialis*						●
Clauzadea monticola	●			●		
Clauzadeana macula	●					
Cliostomum griffithii	●	●	●			●

List of species	BEN	INV	LET	RAS	RED	TAL
Collema auriforme	●		●	●		
Collema cristatum var. *cristatum*			●	●		
Collema fasciculare		●	●			
Collema flaccidum				●		
Collema furfuraceum		●		●		
Collema fuscovirens	●		●	●		
Collema subflaccidum			●	●		
Cornicularia normoerica	●		●			●
Cystocoleus ebeneus	●					●
Degelia atlantica	●	●	●	●		●
Degelia cyanoloma	●	●	●	●		●
Degelia plumbea				●		
Degelia plumbea s. str.		●	●			
Dermatocarpon intestiniforme			●			
Dermatocarpon luridum			●			
Dermatocarpon miniatum				●		
Dibaeis baeomyces			●			
Dimerella pineti						●
Diploicia canescens				●		
Diploschistes muscorum			●			●
Diploschistes scruposus	●					●
Elixia flexella	●					
Endococcus brachysporus					●	
Ephebe lanata	●		●			●
Evernia prunastri	●	●	●			●
Flavoparmelia caperata				●		
Fuscidea cyathoides var. *cyathoides*	●	●	●	●	●	●
Fuscidea gothoburgensis	●					
Fuscidea kochiana			●			
Fuscidea lightfootii	●	●				●
Fuscidea lygaea	●		●			
Fuscidea praeruptorum						●
Fuscidea recensa			●			
Fuscopannaria mediterranea			●			
Fuscopannaria sampaiana			●			
Gomphillus calycioides			●	●		●
Graphis elegans	●	●		●		●

List of species	BEN	INV	LET	RAS	RED	TAL
Graphis scripta	●	●		●		●
Gyalecta jenensis var. *jenensis*	●		●	●		
Gyalecta truncigena			●			
Gyalidea fritzei	●					
Gyalideopsis muscicola			●			●
Haematomma ochroleucum var. *ochroleucum*			●	●	●	
Haematomma ochroleucum var. porphyrium	●		●			●
Hertelidea botryosa	●					
Homostegia piggotii	●					
Hymenelia epulotica				●		
Hymenelia heteromorpha				●		
Hymenelia prevostii	●			●		
Hypogymnia physodes	●	●	●	●	●	●
Hypogymnia tubulosa	●	●	●		●	●
Hypotrachyna laevigata		●		●		●
Hypotrachyna sinuosa		●	●	●		
Icmadophila ericetorum	●		●			●
Imshaugia aleurites	●	●				
Ionaspis lacustris	●	●	●	●		●
Lecanactis abietina	●	●		●		●
Lecanactis latebrarum						●
Lecania naegelii				●		
Lecanora actophila					●	
Lecanora chlarotera	●	●	●	●		●
Lecanora confusa		●	●	●	●	
Lecanora expallens		●	●			
Lecanora gangaleoides		●	●			
Lecanora helicopis					●	
Lecanora intricata		●	●			●
Lecanora polytropa	●	●	●	●	●	
Lecanora pulicaris				●		
Lecanora sulphurea			●			
Lecanora symmicta			●			
Lecidea diducens				●		●
Lecidea fuscoatra s. lat.					●	
Lecidea grisella			●			
Lecidea hypnorum				●		

List of species	BEN	INV	LET	RAS	RED	TAL
Lecidea lapicida	●		●			
Lecidea lithophila	●		●	●	●	
Lecidea phaeops	●					
Lecidea plana	●	●				
Lecidea turgidula	●					
Lecidella asema		●				
Lecidella elaeochroma forma *elaeochroma*	●	●	●	●	●	●
Lecidella stigmatea	●		●			
Lepraria caesioalba		●	●			
Lepraria ecorticata			●			●
Lepraria incana s. lat.		●	●	●		●
Lepraria incana s. str.		●	●			
Lepraria lobificans	●	●	●	●		●
Lepraria membranacea			●			
Lepraria umbricola	●					
Leptogium brebissonii				●		●
Leptogium burgessii	●			●		●
Leptogium cyanescens			●			●
Leptogium gelatinosum				●		
Leptogium lichenoides	●		●	●		
Leptogium pulvinatum	●			●		
Leptogium turgidum				●		
Leptorhaphis epidermidis		●	●			
Lichenomphalia umbellifera		●				●
Lichina confinis		●			●	
Lichina pygmaea					●	
Lobaria amplissima		●	●			
Lobaria pulmonaria	●	●	●	●	●	●
Lobaria scrobiculata	●	●	●	●		●
Lobaria virens		●	●	●	●	●
Lopadium disciforme	●					●
Loxospora elatina	●	●	●	●		●
Megalaria grossa		●	●			
Megalaria pulverea	●					●
Melanelixia fuliginosa	●	●	●			
Melanelixia glabratula	●	●	●		●	
Melanelixia subaurifera	●	●	●	●		●

List of species	BEN	INV	LET	RAS	RED	TAL
Melanohalea exasperata	●			●		
Melanohalea septentrionalis			●			
Melaspilea atroides			●			
Menegazzia terebrata	●					
Micarea adnata						●
Micarea alabastrites	●					
Micarea botryoides	●					
Micarea denigrata		●				
Micarea lignaria var. *endoleuca*	●					
Micarea lignaria var. *lignaria*	●	●	●	●		
Micarea misella	●					
Micarea myriocarpa	●					
Micarea prasina	●					●
Micarea stipitata	●		●			●
Micarea synotheoides						●
Miriquidica pycnocarpa forma *pycnocarpa*						●
Muellerella lichenicola				●		
Mycobilimbia epixanthoides			●			
Mycoblastus affinis	●					
Mycoblastus caesius	●	●	●			●
Mycoblastus sanguinarius forma *sanguinarius*	●	●	●	●		●
Mycoglaena myricae			●			●
Mycomicrothelia confusa				●		
Mycoporum antecellens	●					●
Nephroma laevigatum	●	●	●	●	●	●
Nephroma parile			●	●		
Nesolechia oxyspora	●					
Normandina pulchella	●	●	●	●		●
Ochrolechia androgyna	●		●	●	●	●
Ochrolechia frigida forma *frigida*			●			
Ochrolechia frigida forma *lapuensis*	●					
Ochrolechia microstictoides	●		●			●
Ochrolechia parella		●	●	●	●	
Ochrolechia szatalaënsis	●					
Ochrolechia tartarea	●	●	●	●	●	●
Opegrapha atra		●		●		●
Opegrapha calcarea				●		

List of species	BEN	INV	LET	RAS	RED	TAL
Opegrapha dolomitica			●	●		
Opegrapha gyrocarpa			●	●		●
Opegrapha herbarum	●					
Opegrapha ochrocheila	●			●		
Opegrapha sorediifera						●
Opegrapha vulgata	●	●				●
Opegrapha zonata	●		●	●		●
Ophioparma ventosa	●	●	●			●
Pachyphiale carneola	●	●	●			●
Pannaria conoplea	●		●	●		
Pannaria rubiginosa	●	●	●	●		●
Parmelia discordans	●		●			●
Parmelia omphalodes	●	●	●	●	●	
Parmelia saxatilis	●	●	●	●	●	●
Parmelia sulcata	●	●	●	●	●	●
Parmeliella parvula	●			●		●
Parmeliella testacea				●		
Parmeliella triptophylla	●	●	●	●		●
Parmeliopsis hyperopta	●	●	●			●
Parmotrema crinitum		●	●	●		
Parmotrema perlatum		●	●	●	●	
Peltigera canina			●	●		●
Peltigera horizontalis			●	●		●
Peltigera hymenina	●		●	●	●	●
Peltigera leucophlebia				●		
Peltigera membranacea	●	●	●	●		●
Peltigera praetextata				●		●
Peltigera rufescens			●			
Pertusaria albescens var. *albescens*			●			
Pertusaria albescens var. *corallina*		●	●			
Pertusaria amara forma *amara*	●		●	●		●
Pertusaria aspergilla			●			
Pertusaria borealis	●					
Pertusaria corallina	●	●	●			●
Pertusaria flavicans			●			●
Pertusaria hemisphaerica	●					●
Pertusaria hymenea	●	●	●	●		●

List of species	BEN	INV	LET	RAS	RED	TAL
Pertusaria lactea	●		●	●		
Pertusaria leioplaca		●	●	●		●
Pertusaria multipuncta			●			
Pertusaria ophthalmiza	●					●
Pertusaria pertusa	●	●	●	●		●
Pertusaria pseudocorallina	●		●			
Phaeophyscia orbicularis					●	
Phaeospora parasitica				●		
Phaeospora rimosicola	●					
Phlyctis argena		●				
Physcia adscendens					●	
Physcia aipolia	●	●	●	●		●
Physcia dubia			●			
Physcia leptalea		●	●			
Physconia distorta		●				
Physconia grisea				●		
Piccolia ochrophora	●					●
Pilophorus strumaticus	●					
Placopsis lambii	●		●			
Placynthiella icmalea	●		●			
Placynthium nigrum	●		●	●		
Platismatia glauca	●	●	●	●		●
Platismatia norvegica	●					
Polyblastia albida			●	●		
Polychidium muscicola	●					
Porina aenea		●				●
Porina lectissima			●			
Porpidia cinereoatra	●	●	●			●
Porpidia crustulata			●			
Porpidia flavocruenta	●					
Porpidia macrocarpa forma *macrocarpa*	●	●	●	●		●
Porpidia melinodes	●					●
Porpidia platycarpoides					●	
Porpidia tuberculosa	●	●	●	●	●	●
Protoblastenia calva				●		
Protoblastenia rupestris	●		●	●		
Protopannaria pezizoides	●	●	●	●	●	●

List of species	BEN	INV	LET	RAS	RED	TAL
Protoparmelia badia	●		●			
Protoparmelia ochrococca	●		●			●
Pseudephebe pubescens	●					●
Pseudevernia furfuracea s. lat.					●	
Pseudevernia furfuracea var. *ceratea*	●	●				●
Pseudevernia furfuracea var. *furfuracea*			●			
Pseudocyphellaria norvegica				●		●
Psilolechia lucida			●			●
Psoroma hypnorum	●	●				
Ptychographa xylographoides	●					●
Pycnothelia papillaria	●		●			
Pyrenula chlorospila			●			
Pyrenula macrospora		●		●		●
Pyrenula occidentalis	●		●			●
Racodium rupestre						●
Ramalina cuspidata		●			●	
Ramalina farinacea	●	●	●	●	●	●
Ramalina fastigiata		●				
Ramalina lacera		●				
Ramalina siliquosa		●	●		●	
Ramalina subfarinacea			●		●	
Rhizocarpon geographicum	●	●	●	●	●	●
Rhizocarpon oederi			●			
Rhizocarpon petraeum	●			●		
Rhizocarpon reductum	●	●	●	●		●
Rhizocarpon umbilicatum				●		
Rinodina sophodes		●	●			
Schaereria fuscocinerea var. *fuscocinerea*			●			
Schismatomma quercicola						●
Schismatomma umbrinum						●
Sclerococcum sphaerale	●		●			
Scoliciosporum umbrinum			●			
Skyttea gregaria	●					
Skyttea nitschkei	●					●
Solorina saccata				●		
Solorina saccata			●			
Sphaerophorus fragilis	●		●			●

List of species	**BEN**	**INV**	**LET**	**RAS**	**RED**	**TAL**
Sphaerophorus globosus	●	●	●	●	●	●
Stenocybe nitida	●					●
Stenocybe pullatula	●					
Stenocybe pullatula	●					
Stenocybe septata	●					
Stereocaulon dactylophyllum var. *dactylophyllum*	●		●			
Stereocaulon evolutum			●			
Stereocaulon pileatum			●			
Stereocaulon vesuvianum var. *nodulosum*	●		●			●
Stereocaulon vesuvianum var. *vesuvianum*	●	●	●	●		●
Sticta duforii / canariensis combined morph				●		
Sticta fuliginosa		●		●		●
Sticta limbata	●		●	●	●	●
Sticta sylvatica	●	●	●	●	●	●
Tephromela atra var. *atra*	●		●		●	●
Thelidium decipiens				●		
Thelidium zwackhii	●					
Thelotrema lepadinum	●		●	●	●	●
Thelotrema macrosporum						●
Thelotrema petractoides				●		●
Tomasellia gelatinosa				●		
Toninia thiopsora	●					
Toninia verrucarioides				●		
Trapelia coarctata	●	●				
Trapelia corticola	●		●			
Trapelia glebulosa		●				
Trapelia placodioides			●			●
Trapeliopsis flexuosa	●					
Trapeliopsis gelatinosa		●				●
Trapeliopsis granulosa	●					●
Trapeliopsis pseudogranulosa	●	●	●	●		●
Tremella coppinsii						●
Tremolecia atrata	●		●			
Tuckermannopsis chlorophylla		●	●		●	●
Umbilicaria cylindrica	●		●			
Umbilicaria polyphylla	●					●

List of species	BEN	INV	LET	RAS	RED	TAL
Umbilicaria polyrrhiza			●			●
Umbilicaria proboscidea	●		●			●
Umbilicaria torrefacta	●	●	●		●	●
Usnea cornuta		●				●
Usnea dasopoga	●					●
Usnea flammea	●	●		●		●
Usnea florida			●			
Usnea subfloridana	●	●	●	●		●
Usnea wasmuthii	●	●	●	●		
Verrucaria aquatilis		●				
Verrucaria baldensis	●		●	●		
Verrucaria caerulea				●		
Verrucaria dolosa			●	●		
Verrucaria dufourii				●		
Verrucaria hochstetteri	●		●	●		
Verrucaria macrostoma forma *macrostoma*	●					
Verrucaria maura		●			●	
Verrucaria mucosa					●	
Verrucaria muralis			●			
Verrucaria nigrescens forma *nigrescens*				●		
Verrucaria praetermissa		●				●
Violella fucata	●					●
Wadeana minuta						●
Xanthoparmelia conspersa					●	
Xanthoria aureola		●			●	
Xanthoria candelaria s. str.					●	
Xanthoria parietina		●			●	
Xylographa parallela	●					
Xylographa trunciseda	●					●
Xylographa vitiligo	●					

BEN: Beinn Eighe NNR
INV: Inverewe estate (plantation and garden)
LET: Letterewe Estate
RAS: Rassal Ash Wood
RED: Red Point
TAL: Talladale. See narrative for further details of all these sites.

Notice of Annual General Meeting Saturday 11 January 2014

see the BLS website www.britishlichensociety.org.uk events page for more detail

Venue

B3, School of Life Sciences, The University of Nottingham, University Park, Nottingham NG7 2RD

Travel The University is approximately 3 miles west of the centre of Nottingham. The school of Life Sciences is towards the east of University Park campus.

By road from the M1 Motorway: leave at junction 25 to join the A52 to Nottingham. Turn right at The Priory roundabout (about 4 miles from the M1), then left at the next roundabout to enter the University's West Entrance. **Car parking:** Free parking is provided for those staying at the Orchard Hotel **NG7 2RJ** (please speak to Hotel Reception). Attendees not staying at the Orchard Hotel but wishing to park on campus must use the Visitors' Car Park **NG7 2RD** on weekdays where there is a charge of £7 per day. On Saturday and Sunday parking is free everywhere (including the School of Life Sciences car park).
Campus map? See link on **www.nottingham.ac.uk**
Using satnav? **Orchard Hotel = NG7 2RJ**; **Visitors' Car Park = NG7 2RD**.

Train Regular and fast train services from London St Pancras stop at Nottingham. Taxis are available outside the station. **Bus:** From Broadmarsh Bus Station (about 250 metres north of the railway station) you can take Trent and Barton buses that go past the University [e.g. "Indigo" service, alight at either the Queen's Medical Centre (QMC) or University South Entrance]. From Nottingham City Centre you can catch Nottingham City Transport buses.
A taxi rank is adjacent to the bus station.

From East Midlands Airport Take Trent and Barton Skylink bus to the City Centre. Buses leave outside the Airport Arrivals hall. Alight at University West Entrance for the Orchard Hotel, or University South Entrance for The School of Life Sciences. You can also walk to the taxi rank on the terminal forecourt and take a direct taxi to the University. The cost of a one-way taxi is around £20.

Local Organiser Prof. Peter Crittenden, School of Life Sciences, University of Nottingham, peter.crittenden@nottingham.ac.uk

Exhibition

AGM exhibits can be put up in the School of Life Sciences from 9.15 on Saturday for viewing during lunch and tea breaks until the end of the day. Please advise Peter Crittenden by e-mail of your requirements for tables or display stands before Monday 6 January as these have to be ordered in advance. (Spaces are still available for Posters to be displayed during Symposium sessions: see note following *SUMMARY PROGRAMME*, at the end of this Notice.)

Timetable

Friday 10 January:

The AGM is preceded on Friday 10 January by sessions 1 and 2 of the BLS 2014 Symposium, a summary of which is given below. For more information see the Summer Bulletin 2013 and details of the programme are updated on the *events* page of the Society's website **www.britishlichensociety.org.uk**). BLS Member registration is £15.

New Developments in Lichenology: systematics, ecology and use as indicators of environmental quality

9.00 Welcome to the University of Nottingham, Dr Peter Crittenden

9.10 Session 1: Lichen systematics. Chaired by Dr Cecile Gueidan
Keynote Speaker: Dr Mats Wedin (Swedish Museum of Natural History)
followed by Papers (each 20 minutes) and including Tea / Coffee break

12.45 – 14.00 Lunch at own expense, available in University facilities

14.00 Session 2: Lichen ecophysiology. Chaired by Dr Peter Crittenden
Keynote Speaker: Dr Markus Hauck (University of Goettingen)
followed by Papers (each 20 minutes) and including Tea / Coffee break

17.00 Symposium Posters* Session

* Abstracts for further Posters should be mailed to Barbara Hilton bphilton@eclipse.co.uk accompanied by the Application form available on www.britishlichensociety.org.uk, *events* page, by 30 November. Later entries can be accepted but may not be included in the printed programme available at the Symposium.

Friday 10 January 19.30:
Reception / pay bar, followed by the Symposium dinner / informal buffet and Book Sale (courtesy Mark Seaward), including items donated by Peter James.
IT IS ESSENTIAL TO PRE-BOOK DINNER, £20, ON THE REGISTRATION FORM enclosed with this Bulletin or see www.britishlichensociety.org.uk, *events* page. The VENUE and DEADLINE FOR BOOKING will be confirmed on the website.

Saturday 11 January:
9.15 The School of Life Sciences open
9.30 Tea / Coffee available in The School of Life Sciences
10.00 Annual General Meeting, B3, School of Life Sciences
12.00 Lunch at own expense in University facilities
Posters and Exhibits available for viewing

13.30 Symposium session 3. Lichen communities and environmental quality. Chaired by Pat Wolseley. Keynote Speaker: Dr Christopher Ellis (Royal Botanic Garden Edinburgh)
followed by Papers (each 20 minutes)
16.30 Tea / Coffee
17.00 Symposium session 4: Host's session. Chaired by Prof. David Hawksworth
18.00 End of the AGM meeting and Symposium

Nominations for Officers of the Society
Nominations are invited for Officers for 2014 and two members of Council for the period 2014 – 2017 (retiring at the AGM held in early 2017). Proposals should be sent by e-mail or in writing to the Secretary (Dr. Chris Ellis, Royal Botanic Garden Edinburgh, 20A Inverleith Row, Edinburgh, EH3 5LR, Scotland C.Ellis@rbge.ac.uk) at least 2 weeks before the AGM. No person may be nominated without their consent. Allan Pentecost and Mark Powell are due to retire from Council and are not eligible for re-election. We thank them both for their service.

Post-AGM meal
For those who would like to eat together on Saturday evening following the AGM, information on local restaurants will be given during the meetings.

Post-AGM excursion
Sunday 12 January – Calke Abbey (NT) Park and National Nature Reserve, Derbyshire No lichen records are held for the Park, home to some of the oldest trees in Europe. The quality and extent of the ancient trees and the insects that live on them – especially those associated with decaying wood – justify the Park's NNR status. Many of the trees are more than 400 years old, some are over 700 years and

two of the oaks are thought to be over 1000 years old. The Park is about 12 miles south of Derby, 20 miles southwest of Nottingham. Steve Price, Field Meetings Secretary, has liaised with the Warden, who is enthusiastic about our visit. Information about travel arrangements to Calke Abbey will be given at the AGM and also on Saturday afternoon.

Accommodation

Symposium Hotel: The Orchard Hotel, University of Nottingham NG7 2RJ
Ideally located at the University, the newly built, comfortable and well-appointed Orchard Hotel is designed to the highest environmental standards, eco-friendly and featuring accessible rooftop terraces, green roofs and maximum use of natural daylight. Open spaces provide superb views of The University of Nottingham's extensively landscaped campus, spanning 330 acres. **BEDROOMS ARE BEING HELD AT PREFERENTIAL RATES UNTIL 1 DECEMBER 2013** (and will then be released). Delegates should **telephone The Orchard Hotel reservations team (0844 346 1216) and book individually, quoting** ***School of Life Sciences AGM***. (Bed and breakfast room prices including VAT: Wednesday 8th January @ £55; Thursday 9th January @ £55; Friday 10th January @ £45; Saturday 11th January @ £45)

For alternative accommodation: contact Nottinghamshire Tourism on 0844 77 5678 or www.experiencenottinghamshire.com

ABSTRACTS OF SYMPOSIUM PAPERS

The abstracts that follow are grouped by Symposium Session, with the Keynote Presentation followed by others listed alphabetically by family name of the first author; this is not necessarily the order of presentation at the Symposium. All abstracts (including Symposium posters that are notified by 30 November) will be posted in advance of the meeting on the BLS website www.thebritishlichensociety.org.uk, and available in a printed booklet at the Symposium.

LICHEN SYSTEMATICS

Keynote presentation

Mats Wedin
Department of Cryptogamic Botany, *Swedish Museum* of. *Natural History*, *P.O. Box 50007*, *SE-104 05. Stockholm*, *Sweden*
Abstract is shown on www.britishlichensociety.org.uk

Molecular systematics and taxonomy of Southeast Asian members of the tropical rainforest genus *Phyllopsora* (*Ramalinaceae*)

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The mainly tropical rainforest genus *Phyllopsora* (Ramalinaceae) consists of ca. 70 known species. The circumscription of the genus is not clear, and species identification is often difficult due to few morphological characters. The secondary chemistry is rich, however, and offers an important first tool in identification work. We have addressed problems in the current genus and species circumscriptions by molecular methods. About 40 *Phyllopsora* species have been sequenced so far, and preliminary results from our on-going construction of the genus' phylogeny and from our taxonomic revision of the species in SE Asia will be presented.

Species concepts in *Bryoria* sect. *Implexae* (*Parmeliaceae*): is chemistry a sound diagnostic character?

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Bryoria causes taxonomic problems due to the morphological and chemical variability, and the few other diagnostic characters often present. The sect. *Implexae* is the most problematic, and is composed in Europe by lichens named as *Bryoria capillaris, B. chalybeiformis, B. fuscescens, B. glabra, B. implexa, B. lanestris,* and *B. subcana.* One of the characters used to separate the "species" has been the chemical products (extrolites), but their distribution can be patchy. We performed a phylogenetic analysis using the nuITS, nuLSU, MCM7, RPB1 and mtSSU regions. The topology

obtained does not match with that of the chemical products. Further, a study of populations in the central mountains of Spain highlighted the problems when the genetic (nuITS) and chemical (TLC analysis) diversity was compared, including different regions of single thalli. Autofluorescence was used to demonstrate the location of extrolites. Our preliminary data suggest that: (a) The European populations of sect. *Implexae* may best be considered as a single species; (b) a single thallus can be composed by two or more genotically distinct individuals; (c) extrolites are heterogeneously distributed along the thallus and can be restricted to certain parts; and (d) the chemotype identification by traditional reagent spot test can lead to errors.

Saxicolous and terricolous lichens of the Natural Park of Cap de Creus, including a phylogenetic study applied to the systematics of the genera *Diploschistes* and *Ingvariella*

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The Natural Park of Cap de Creus (Spain) represents an area of interest due to its geology, exhibiting a wide variety of rock types. The saxicolous and terricolous lichen flora from the Park were investigated, and we report 263 lichens and 35 lichenicolous fungi (four of them undescribed), including one new species for Europe and ten for the Iberian Peninsula. During this floristic study, we detected unresolved taxonomic and systematic questions regarding the genera *Diploschistes* and *Ingvariella*.

To assess these questions, we reconstructed the phylogenetic relationships of *Diploschistes* within the context of the family Graphidaceae, and confirmed that the genus is monophyletic as currently circumscribed. We also reconstructed the phylogenetic relationships within *Diploschistes* using a combined dataset of morphological, chemical, and molecular data. The results show that the three groups traditionally distinguished within the genus, based on ascomatal morphology, are monophyletic.

The monotypic genus *Ingvariella*, previously segregated from *Diploschistes* based on fruiting body anatomy, and placed within the Graphidaceae, is shown to be monophyletic and belonging to the Stictidaceae, expanding the broad ecological diversity of this family. Our own morphological observations back up these results.

Diversity of black and lichenicolous fungi from lichen communities in the Alps

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Lichen symbioses are shaped and colonized by biologically and phylogenetically diverse fungi. Lichenicolous fungal species develop diagnostic structures and symptoms on the host lichen, whereas endolichenic fungi occur cryptically in the lichen thalli. Lichenicolous fungi exhibit varying degrees of host specificity, and occur as parasites or commensalists. The patterns of host specificity are insufficiently known and we hypothesize that lichenicolous fungi could also occur cryptically in other than their known hosts. We are testing this hypothesis with a community-based approach using sequencing of the fungal ITS, fingerprint methods (SSCP), phylogenetic analyses, culture isolations and analyses of species diversity. Our study area is the Koralpe range in southern Austria, a particularly lichen-rich alpine area. We comprehensively sampled alpine lichen communities in ten plots including uninfected thalli and thalli visibly infected by lichenicolous fungi. Our results show that almost 10% of the collected lichen thalli are visibly infected. The majority of the thalli analyzed by SSCP revealed the presence of multiple fungi inside the lichen thallus. The phylogenetic analyses of culture isolates of lichen-inhabiting fungal strains place these fungi in Chaetothyriomycetidae and Dothideomyceta. The close relationships with fungi from other hostile habits indicate that lichens represent an evolutionary hot-bed of polyextremotolerant fungi.

Niche shifts in lichens: are they real or the result of cryptic speciation? A case study in the boreal lichen *Cladonia botrytes*

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In the face of climate change in the next decades, considerable research effort is being invested in understanding the ecological behaviour of lichens in different parts of their range. With lichens, little work has been directed to studying niche shifts, and currently ecological variability is difficult to parse from unknown patterns of cryptic speciation, widespread in fungi. Our study focuses on the genetic structure of European populations of red-listed *Cladonia botrytes,* which is a boreal species thought to be obligately associated with dead wood in forests, especially in Central Europe and southern Fennoscandia. However, in the northern parts of its range in Fennoscandia it can also occur on other substrates, such as soil. We ask whether substrate switches in *C. botrytes* are bona fide niche shifts or the manifestation of hidden genetic differences. We use samples from Fennoscandia and Central Europe, and data from the nuclear ribosomal internal transcribed spacer (ITS1-5.8s-ITS2) region to study genetic variability in relation to substrate switches. Preliminary results showing coding regions of the sequences of *Cladonia botrytes* from both, soil and wood habitats are identical, non-coding parts feature variability in six positions, but clear link to habitat preferences is not confirmed yet. The variability in both non-coding regions does not feature specific pattern (ecological, morphological, phylogenetical), therefore, further data need to be generated.

Evolution of specificity in fungi-cyanobacteria symbioses: a case study in *Peltigera* section *Polydactylon*

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Variation in levels of specificity among symbiotic partners is key to a comprehensive understanding of the evolution of symbiotic systems. This variation is expected to occur within species as well as within a broad inter-species phylogenetic framework. We assessed the level of specificity of symbioses between the lichen-forming fungus Peltigera, section Polydactylon (mycobiont) and its cyanobacterial partner Nostoc (cyanobiont), by inferring the phylogeny of the mycobiont, based on five nuclear loci, and of their cyanobionts, using the rbcLX region. We sequenced the DNA of the mycobiont and cyanobiont of 208 lichen thalli, representing ~40 putative fungal species sampled world-wide. We found a broad spectrum of specificity for both partners ranging from strict specialists to generalists. The trend observed was one where mycobionts are more specialized, associating mostly with one or few Nostoc phylotypes, than cyanobionts, which are generalists, associating frequently with several Peltigera species. Mycobiont species resulting from recent speciation events, which seem to be associated with the colonization of a new biogeographical area, switched to a generalist selection of cyanobionts, while specialization of the mycobiont seems to be favored in areas where species have been established for long periods, and to decrease the genetic variation of the mycobiont.

Diversity, speciation and co-evolution in lichenicolous fungi: the *Biatoropsis-Usnea* system.

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Lichenicolous fungi are frequent within the Tremellales (Basidiomycota). Co-evolution has been suggested as a main speciation force in host-parasite associations. Species delimitation in lichenicolous Tremellales is often challenging since morphological characters are scant, and host-specificity is therefore a great aid to discriminate between species. Here, we use the *Biatoropsis-Usnea* associations to study factors inducing parasite diversification. *Biatoropis usnearum* (Tremellales) induces the formation of galls or deformations on its hosts. These galls are remarkably variable in size, shape, and colour, and preliminary molecular data suggest that *Biatoropsis usnearum* may in reality represent a species complex. *Biatoropsis* grows on *Usnea* and *Protousnea* (Parmeliaceae), two genera with a high degree of phenotypic plasticity, which complicates the identification of species. We use morphological data and molecular methods – including the general mixed Yule-coalescent (GMYC) model – to assess the diversity of fungi currently assigned to *Biatoropsis usnearum*, and to determine the phylogenetic relationships among them. In parallel, we reconstruct molecular phylogenetic hypotheses of the *Usnea* and *Protousnea* hosts. We use co-

phylogenetic analysis tools to detect possible events of host-parasite coevolution, and to assess the extent of cospeciation, duplication, host switching, loss, or divergence failure that explain the history of this association.

The lichen reproductive system affects the photobiont diversity in *Cladonia* species

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In lichen symbiosis, associated partners propagate either independently or by dispersal of joint propagules, such as isidia or soredia. Joint dispersal of symbionts avoids problems of possible low partner availability in the environment, and allows fast colonization of free habitats. On the other hand, independently dispersed bionts must always find the suitable partner and establish the lichen thallus *de novo*. According to several recent studies, dispersal strategies seem to influence the diversity of associated partners. We studied diversity of photobionts associated with four zeorin-containg red-fruited *Cladonia* species. Two of them, *Cladonia deformis* and *C. pleurota* are characterised by production of soredia, whereas *C. coccifera* and *C. diversa* reproduce mostly sexually by ascospores. We sequenced ITS rDNA and intron-containing actin gene nuclear markers of fourty-seven *Cladonia* specimens from Europe and North America. Our results show clear pattern of decreased photobiont diversity in *Cladonia* species with joint dispersal strategy compared to species with predominant sexual reproduction. Whereas we detected only two *Asterochloris* lineages associated with sorediate species, at least eight *Asterochloris* lineages have been found in esorediate species. Our results suggest that different dispersal strategies of symbiotic partners may strongly affect photobiont diversity, and possibly lead to co-evolution of associated symbionts.

LICHEN ECOPHYSIOLOGY

Keynote presentation

Including the functions of lichen substances in ecophysiological studies

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One of the most unique characters of lichens is, beyond their symbiotic nature, the production of numerous carbon-based secondary compounds (*ca* 800 lichen substances), most of which do not occur in organisms other than lichens. Lichen ecophysiology has received much attention because of the ability of lichens to cope with extreme environmental conditions, including extreme cold in the polar regions and high mountains, heat in periodically dewy deserts, low nutrient availability in many habitats colonized by lichens, salinity, and high concentrations of heavy metals or the inability of most lichens to withstand high concentrations of sulphur dioxide. Potential functions of lichen substances were only hesitantly incorporated in lichen ecophysiological work, for example, in studies of heavy metal tolerance by Purvis et al. (1984, 1990) or of carbon and water relations by Lange et al. (1997). However, experiments conducted with lichen thalli with and without their natural content of secondary products suggest that they play a key role in lichen adaptation to the chemical environment. Lichen products influence a species preference for certain pH ranges of the substratum and play a role in metal homeostasis.

Application of a live cell mitochondrial staining method for 3D reconstruction and measurement of *Trebouxia* sp. photobiont chondriomes.

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The chondriome occupies a central position in many biochemical processes including respiration. Despite this, there has been little work exploring the morphology of mitochondria in photobionts, partly due to the difficulty of accurately imaging these organelles. Therefore, a live cell mitochondrial staining method was developed and validated for labeling the chondriome in *Trebouxia* sp. Photobionts obtained directly from lichens without the need for culture. *Trebouxia* sp. were obtained from wild collected lichens. These were ground in distilled water and the released photobionts purified by differential centrifugation. Several different candidate stains were tested including Rhodamine 123, several mitotracker dyes (Invitrogen, UK) and DASPMI. Optimal labeling was obtained using mitotracker orange (concentration = 1 μm). Confocal imaging allowed both 3D reconstruction and accurate quantification of both morphology and mitochondrial volume. This allowed determination of the relationship between the chondriome and other cellular organelles most notably the chloroplast. This technique will find application in several areas of lichen research notably photobiont taxonomy and energetics. The technique will also facilitate studies of the effect of lichenisation on photobiont mitochondrial morphology.

Phytase activity in *Evernia prunastri*

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Most lichens occupy habitats deficient in N and P and have high uptake capacities for inorganic forms of these elements. Lichens also have surface-bound phosphatase activities which are thought to promote capture of inorganic P from organic compounds by catalysing the hydrolysis of phosphate ester bonds. Inositol hexaphosphate (InsP6, = phytic acid) is among the principal forms of organic P in plants and fungi, and is an abundant and recalcitrant form of P in soils. Phytase, a specific phosphatase that hydrolyses phosphate bonds in inositol phosphates, has been demonstrated in both saprotrophic and mycorrhizal fungi. Here, using high performance ion chromatography to measure the rates of consumption of InsP6 and the production of lower order inositol phosphates, we demonstrate the presence of phytase activity in *Evernia prunastri* and other epiphytic lichens. We discuss the ecological relevance of these findings.

New insights on morphological and metabolic variability of yellow-green *Xanthoparmelia* in NW Italy

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Forty-eight mature thalli of yellow-green *Xanthoparmelia* were collected in two alpine sites of North-Western Italy, sharing altitude (600-800 m), gneissic lithology and xeric climate conditions. They were analysed for the morphology of lobes and asexual propagules, the colour of the lower thalline surfaces and the presence of secondary compounds evaluated by spot tests and TLC. Although intra-thalline variability of chemical characters repeatedly emerged and many thalli did not show a full correspondence with the described set of characters, the specimens were tentatively ascribed to 9 out of the 11 Italian species. Quantitative ultra-high performance liquid chromatography (UHPLC-DAD), coupled with metabolite identification by liquid chromatography mass spectrometry (LC-DAD-MS/MS), displayed in the sample-set a rather continuous variability in the amount of the different medullary depsidones and presences/co-presences of some of these latter non reported for Italian species. These findings suggest that also the European species of yellow-green *Xanthoparmelia* may have faint boundaries, especially with reference to chemical characters, or that the existence of hybrid individuals has to be considered, as suggested in the case of *Usnea*.

Physiological performance of *Cladonia portentosa* after 11 years of wet ammonium and nitrate deposition and role of potassium and phosphorus external supply

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Lichens are among the most sensitive organisms to nitrogen (N) pollution at the ecosystem level. Several papers have considered N tolerance in lichens, however many questions on the topic are still unsolved. Moreover, reactive N effects have been shown to increase over time, confirming that long-term experiments are needed to better characterize these responses in different ecosystems.

The Whim Bog manipulation experiment has been providing wet and dry deposition to ombrotrophic bog vegetation containing the matt forming lichen *Cladonia portentosa* since 2002, offering the potential to study such interactions in a controlled environment.

Samples of *C. portentosa* were collected and physiological parameters (pH, gas exchange, photosynthetic parameters, vitality index) and ultrastructural characteristics were analyzed in case of wet deposition. The role of potassium (K) and phosphorous (P) in alleviating N toxicity symptoms was considered.

Algal cell ultrastructure showed to be affected by different treatments. Samples receiving P and K showed an increased activity of the algal partner. Thallus pH showed to be influenced by different forms and concentrations of N. These results contribute to link physiological and morphological effects to the ecological consequences of N excess providing a more integrated approach to managing and offer important clues for future research.

The Waterfan Lichens *Peltigera hydrothyria* and *P. gowardii*: two rare endangered macrolichens endemic to North America that grow underwater, and are indicators of water quality.

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Recently recognised as distinct species, *Peltigera hydrothyria* and *P. gowardii* occur respectively in eastern and western North America. The former occurs in streams with dappled sunlight shaded by deciduous trees, the latter in alpine and subalpine habitats in full sunlight. Both species grow in streams that flow all year, have a pH close to neutrality and are intolerant of silt or pollutants. Populations can be affected by changes in any of these factors or by climate change. The presentation includes illustrations of these two unusual lichens, their distribution, their habitat, and what is known about their ecophysiology. Finally, the current threats to the Waterfan lichen populations are summarized.

Observing growth in podetia of *Cladonia portentosa* using 3-dimensional X-ray micro-computed tomography.

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Unlike vascular plants very little is known about the how growth proceeds in mat forming lichens. In this study we use X-ray micro-computed tomography (CT) to image and quantify changes across time in the 3-dimensional structures of individual podetia of *Cladonia portentosa*. Podetia were allowed to grow in the natural environment at a heathland site and were briefly returned to the laboratory for scanning at 2–3 monthly time intervals. We measured the surface area, bifurcation ratio, rate of new branch addition, relative growth rate (RGR) and unit leaf rate (ULR). Results demonstrate that both growth and branching occur throughout the year but on different schedules. The greatest growth (ULR and RGR) is seen during May and June while the branching rate is greatest in high summer and least in early spring. The total number of branches and nodes change simultaneously, maintaining a bifurcation ratio of 2 with the number of branches and podetium mass increasing by 35% and 31%, respectively, during the first 10 months of the study. The work improves understanding of growth in *C. portentosa* and also demonstrates the utility of X-ray micro-CT for measuring changes in dynamic living structures with exquisite precision.

LICHEN COMMUNITIES AND ENVIRONMENTAL QUALITY

Keynote Presentation

Lichen Communities and Environmental Quality

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It has long been established that lichen communities are responsive to environmental change; for example, (i) contrasting pollution types, and (ii) the spatial extent/connectivity and temporal continuity of woodland have been shown to control lichen species' distribution and abundance. Emerging threats to lichens accompany these previously established effects, and issues such as climate change and tree disease add significant complexity to conservation. This talk explores methods for coping with the multiple drivers of environmental change, which will affect lichen diversity during the 21st Century and beyond. The British Lichen Society's distributional datasets are utilised, to explore the long-term impact of climate change – including uncertainty in climate models – alongside changing pollution regimes, and shifts in woodland tree species composition, through to 2080. The results facilitate discussion about the future of lichen diversity in the British countryside: (i) can we conserve the status quo? (ii) how far and how fast might species have to migrate to cope with climate change? (iii) how important is the direct effect of climate change, compared with changes in woodland composition, for example the potential loss of ash? In answering these and many other challenging questions the British Lichen Society has a lead role to play.

Exploring the spatial structure of lichen functional traits, in relation with environmental factors

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Lichen functional traits have been recently used as ecological indicators for monitoring changes in ecosystems. This approach is supposed to be potentially a more universal tool, overcoming regional differences which are often observed in species diversity and composition. Therefore it could be used for comparing biomonitoring data collected over large areas under heterogeneous environmental conditions.

In this work, we use a regional dataset to explore the spatial structure of morpho-functional lichen traits and its relationship with environmental data. In particular, we assume that some spatial factors underlie the abundance of lichen functional traits and are at the basis of their possible correlations between and across locations. In order to find these latent factors, a generalized common spatial factor model has been applied to lichen data and it has been implemented in a Bayesian framework.

The application of this model can help to clarify and weight the relative contribution of spatial-related variables and provide tools for a more correct interpretation of biomonitoring data, in terms of effects of atmospheric pollution or other anthropogenic disturbances.

Lichens of the Rollright Stones

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The Rollright Stones are an assemblage of Jurassic oolitic limestone rocks dating from 4,000 to 4,500 years before the present. They are located on the Oxfordshire-Warwickshire border. They are contemporaneous with Stonehenge.

Rarely examined for their lichens, we undertook a study of the lichens growing on these ancient monuments. The stones are assembled in three groupings within an area of 250 m of each other. The largest assemblage, The Kings Men, consists of 77 stones. The Whispering Knights, a grouping of six stones, have never been examined for their lichens nor has The Kings Stone, a single stone about 3 m in height. 75 species were identified, a number comparable to the lichens found at Stonehenge. This increases the number of identified species by 25% from the only previous study done in 2000. 33 different genera were identified with the most common being in the genus *Caloplaca* (13 species), *Lecanora* (10 species) and *Verrucaria* (10 species).

Monitoring of the lichens of The Rollright Stones will continue as this is a site of great archaeological interest.

***Hypogymnia* frequency and lichen species composition on *Betula* in S. Urals in relation to bark acidity and element concentrations**

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Lichen monitoring was carried out across 2 transects in 2011 centred on Karabash smelter in the South Urals of Russia in birch woodlands, at the border between the Taiga and Forest-Steppe zone, as part of 'ground-truth remote sensing studies' within EU ImpactMin WP7 Chelyabinsk-Orenburg Case study, Russia: (i) SE-NW transect first established in 2001 and (ii) W-E transect established in 2011. Monitoring was undertaken with reference to an outlier at Nazminsky Ridge, 6 km north of the industrial city Zlatoust. Epiphytic lichen diversity on trunks and twigs was assessed, and transplants of the lichen *Hypogymnia physodes*, which is relatively tolerant to SO_2 pollution and heavy metals, deployed over a 3 month exposure period. Bark (trunk and twigs) was sampled and surface pH measured. Transplants, naturally occurring *Hypogymnia*, and bark (trunk and twig) samples were analysed for their multi-element content. This is the first study to consider lichen diversity and *H. physodes* frequency on *Betula* trunks and twigs in relation to bark pH and element concentrations. It deals with one of a very few remaining epiphytic lichen deserts with a lack of epiphytic lichens near the pollution source, a phenomenon which has vanished from most countries today. The persistence of relict lichen assemblages under favourable geological conditions, and existence of a refugium enabling future lichen re-colonisation elsewhere under favourable atmospheric conditions, are considered.

How does nitrogen deposition affect the post-fire recolonisation and diversity of heathland cryptogamic flora?

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Cryptogamic flora are widely recognised as being highly sensitive to increases in atmospheric nitrogen (N) deposition across many global ecosystems. Given that lichen and bryophyte groups often constitute a substantial part of the biomass in many habitats (e.g. arctic tundra, boreal forests), threats to their abundance and vitality from anthropogenic pollution sources inherently imply detrimental impacts to the biodiversity of the ecosystems in which they grow. In typically species-poor heathland systems, the bulk of floristic diversity is often represented by lichen and bryophyte groups. Using a British lowland heathland system as its study site, this paper looks at the impact of nitrogen addition (at a rate of 0 or 30 kg N ha^{1} yr^{1}) on the abundance, reproductive potential and early stage successional pathways of re-colonising cryptogamic flora, five years after a severe wildfire.

Our findings demonstrate that the early-stage recolonisation of lower plant species is detrimentally influenced by N additions, characterised by overall decline in species diversity, reduced reproductive viability of typical heathland species and shifts towards more nitrophilous assemblages.

Estimating occupancy and trends of lichen species from observation and collection data

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Currently, many novel methods are being developed to estimate the change that a species occurs in a certain area, based on different types of data. Data sources include 1) unstructured, single observations, including herbarium specimens, 2) more or less complete lists of species in a certain area, and 3) data from monitoring schemes. The 2012 Red List of lichens in the Netherlands is used as a showcase of different approaches to estimate trends and occupancy of lichen species and their relation to changes in the environment.

Corticolous lichen species: indicators for vegetation quality in paired disturbed/undisturbed vegetation types in central mountains of Sri Lanka

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Corticolous lichen species are identified as indicators of disturbance for seven vegetation types in central mountains of Sri Lanka (4 disturbed, 3 undisturbed matched by habitat). Ordination of lichen communities (6 sites / type for 42 sites) shows distinct species composition of vegetation types. Disturbed and undisturbed sites differ; undisturbed sites have higher species richness of both trees and lichens. Canopy cover, bark pH, distance to an undisturbed site, and years since disturbance were all correlated with a disturbance gradient.

Indicator species analysis (ISA) was performed on three different sets of site groups: seven vegetation types, three groups of sites with different disturbance levels, and two groups of sites near to vs. far from an undisturbed site. 20 species are strong indicators of undisturbed sites from all three ISA analyses; three species indicate moderately disturbed sites; five species indicate very disturbed sites. Six additional species are weaker indicators of disturbance level. 34 species are strong indicators for a single vegetation type. Several *Graphis* species were good indicators but are difficult to distinguish. Most indicators of disturbance level are visually distinct. Parataxonomists could be trained to identify them in the field; these will be the most useful indicators for land managers.

HOST'S SESSION

The *Trypetheliaceae* - an important tropical lichen family including *ca* 100 new species

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The *Trypetheliaceae* are tropical pyrenocarpous corticolous lichens. They received much attention in the 19th century. By 1950, there were as many names for species in the family as there were specimens collected. Only since around the turn of the last century, many specimens were collected. The family turns out to be rather species-poor in Asia, Australia and Africa, but in the neotropics, and especially in South America, about 100 new species were encountered. The genera within the family were highly artificial, even after the many changes in classification, so much so that even a single collection could partly belong to one genus, and partly to another. Now that the main lines of the phylogeny have been reconstructed, the new species can be described in appropriate genera. Following the trend in e.g. *Graphidaceae*, and in accordance with the phylogenetic reconstructions, a rather strict species concept is to be applied, where hamathecium inspersion and the presence of lichexanthone are species characters. The family is an important part of the lichen biodiversity in at least the neotropics, where it locally accounts for 10-20% of the species.

From shade to sun: evolution of the Teloschistaceae

Gaya E.[1,2,3]; Fernandez-Brime S.[2]; Gueidan, C[4]; Vargas, R. [3]; Ramirez-Mejia M.[1,4] & Lutzoni F.[1]

[1]*Department of Biology, Duke University, Durham, North Carolina, USA*

[2]*Department of Plant Biology (Botany Unit), Facultat de Biologia, Universitat de Barcelona, Barcelona, Spain*

[3]*Royal Botanic Gardens, Kew, Richmond, UK*

[4]*The Natural History Museum, London, UK*

[5]*Departamento de Botanica, Universidad de Concepcion, Concepcion, Chile*

[6]*Department of Biology, Universidad de Los Andes, Bogotá, Colombia*

The bright orange-colored species of the *Teloschistales* are among the most noticeable lichens worldwide. This recently redefined monophyletic order includes nearly 1,000 species that are present in a myriad of habitats, including man-made substrates and endangered ecosystems such as the coastal fog deserts of Namib and Atacama, where the *Teloschistales* dominate.

In this study, the hypothesis that speciation rates increased at the root of the *Teloschistaceae* was generally supported. The divergence time of this group seems to be aligned with the diversification of Eudicot flowering plants. These findings are particularly interesting because the root of the *Teloschistaceae* is assocatied with the evolution of a set of key morphological and ecological traits. For example, it seems that the ancestor of the *Teloschistales* was growing predominantly on bark and lived in the shade of trees and shrubs. With the origin of the *Teloschistaceae*, this group of lichens seems to have evolved to become predominantly saxicolous (growing on rocks) and became exposed to direct sunlight. This transition from shade to light, is associated with the origin of anthraquinones in the thallus (these are characteristic secondary compounds providing protection against direct sunlight).

What's in a name? That which we call a species

Lumbsch H.T., Leavitt S.D. & Parnmen S.

Integrative Research Centre, The Field Museum, 1400 South Lake Shore Drive, Chicago, Illinois 60605, USA

Delimitation of lichen-forming fungi has traditionally been a matter of debate, including discussions on the taxonomic importance of morphological characters, such as presence of isidia or soredia (species pairs), and the importance of the presence of secondary metabolites (chemotypes vs. chemospecies). The presentation will show how DNA sequence data have changed our understanding of delimitation of species and how it changed our view of phenotypical characters in these fungi. In numerous cases, so-called cryptic species, lacking obvious phenotypical characters, have been found and it is shown how refined species delimitations help to better understand distribution patterns in lichenized fungi. However, the interpretation of molecular data at the interface of phylogeny and population biology has also pitfalls and potential issues are discussed. Coalescence-based approaches are shown to be promising to overcome these issues and lead to a more natural circumscription of species in lichenized fungi.

ANNUAL GENERAL MEETING AGENDA

10.00 Saturday 11 January 2014, B3, School of Life Sciences, University of Nottingham

Please sign attendance list and write your own name badge.

1 Apologies for absence
2 Minutes of the Annual General Meeting held at the Royal Botanic Gardens Kew, Richmond, Surrey TW9 3AB, 26 January 2013
3 Matters arising
4 Reports of Officers and Committee Chairs:

4.1	President	(Barbara Hilton)
4.2	Secretary	(Christopher Ellis)
4.3	Treasurer	(John Skinner)
4.4	Membership Secretary	(Heidi Döring)
4.5	Conservation	(Bryan Edwards)
4.6	Churchyards S/C	(Ishpi Blatchley)
4.7	Education and Promotions	(Sally Eaton)
4.8	Members' Services	(David Hill)
4.9	Website	(Janet Simkin)
4.10	Field Meetings Secretary	(Steve Price)
4.11	*Bulletin* Editor	(Paul Cannon)
4.12	*The Lichenologist* Senior Editor	(Peter Crittenden)
4.13	Librarian	(Ray Woods)
4.14	Herbarium Curator	(Richard Brinklow)

5 Election of Officers, including two members of Council
6 Ursula Duncan Award (Peter Crittenden)
7 Proposed changes to the Constitution
8 Any other business
9 Date and place of AGM 2015

Book review

DOBSON, F.S. (2013) *A Field Key to Lichens on Trees*. Published by the author; for further details or to purchase the book email fsdobson@sky.com or contact Richmond Publishing using the details at the end of this *Bulletin*. ISBN: 978 0 954232467.

This is the third identification aid in the same format published by the author on British lichens, the previous ones dealing – mostly - with saxicolous species. In addition to corticolous species, he also includes species growing on decorticated wood and on manmade substrates such as fences, gates and benches. This volume is more ambitious than its predecessors as it keys out around 500 species; by comparison the Churchyard volume, now in its 3rd edition, included 180 taxa, some also found on bare or sawn wood. Once again lichen identification can be achieved by using either the table of characters - in the format of a multi entry key - or the dichotomous keys. The plates of coloured photographs at the beginning of the book illustrate nearly a third of the species included, and are the most eye catching pages of the publication even if a few of the images are a little overexposed.

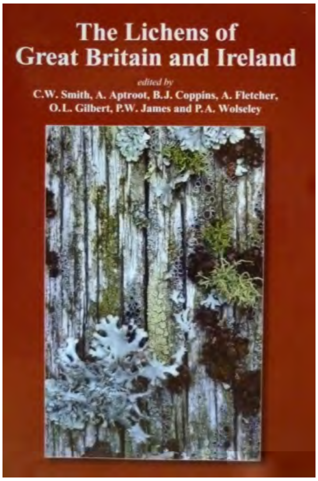
The keys are preceded by an introduction on the factors affecting lichen distribution on trees, and microhabitat preferences. I especially like the table references to bark pH values and total number of species recorded on some tree species. This is something I have not seeing included often in similar British publications on epiphytes, and yet much talked about in the continent when I was student, while citing J.J. Barkman's (1969) magnum opus '*Phytosociology and ecology of cryptogamic epiphytes*' (published by VanGorcum & Co. Ltd., Assen, Netherlands).

The book is aimed to attract and aid beginners with the naming of the most common lichens found on bark and wood. For a comprehensive treatment of the species the reader is referred to other publications such as the latest edition of '*The lichen flora of Great Britain and Ireland'* or the authors' own publication '*Lichens – an illustrated guide to the British and Irish species*'. In my opinion, the three volumes on this 'series' complement and - with the addition of diagnosis for some rare species – even expand the scope of his illustrated guide, and they are more 'user friendly' than the lichen flora. This, like his other books, is a reflection of the ability of the author to make the subject approachable to us all.

Begoña Aguirre-Hudson

Publications and other items for sale

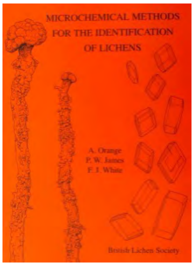
Please contact The Richmond Publishing Co. Ltd, P.O. Box 963, Slough SL2 3RS, tel. (+44) (0)1753 643104, email rpc@richmond.co.uk to purchase these items.



Cat.1. The Lichens of Great Britain & Ireland. Ed. Smith et al. (2009). Hardback, 700pp.
This work, a much enlarged revision of 'The Lichen Flora of Great Britain and Ireland published in 1992, reflects the enormous advances in lichen taxonomy over the last two decades. There are keys to 327 genera and 1873 species, with detailed descriptions and information on chemistry and distributions. The language is accessible, avoiding obscure terminology and the keys are elegant. The Lichens of Britain and Ireland is undoubtedly the standard work for the identification of lichens in Great Britain and Ireland and will be indispensible to all serious students of lichens and to other biologists working in the related fields of ecology, pollution, chemical and environmental studies.

BLS members: £45.00 ; non-members £65.00
Postage & Packing £7.50 UK, £15.00 overseas
(note this is a very heavy book!).

Lichen Atlas of the British Isles, ed. M.R.D. Seaward
The Atlas has been published in fascicles, unbound A4 sheets hole-punched for keeping in a ring binder. Each species account includes a distribution map and a discussion of the lichen's habitat, ecology, identification and status.
Cat.2. Fascicle 2: *Cladonia* part 1 (59 spp). 1996. **Out of print.**
Cat.3. Fascicle 3: The foliose *Physciaceae* (*Anaptychia*, *Heterodermia*, *Hyperphyscia*, *Phaeophyscia*, *Physcia*, *Tornabea*) plus *Arctomia*, *Lobaria*, *Massalongia*, *Pseudocyphellaria*, *Psoroma*, *Solorina*, *Sticta*, *Teloschistes*. (54 spp) 1998.
Cat.4. Fascicle 4: *Cavernularia*, *Degelia*, *Lepraria*, *Leproloma*, *Moelleropsis*, *Pannaria*, *Parmeliella*. (36 spp) 1999.
Cat.5. Fascicle 5: Aquatic Lichens and *Cladonia* part 2. (64 spp). 2000.
Cat.6. Fascicle 6: *Caloplaca*. (58 spp) 2001.
All fascicles are offered to members at a special price of £4.00 each , (approximately half price). Price to non-members is £6.00 per fascicle. Postage & Packing £3.50 UK, 10.00 overseas, per fascicle.
Cat.7. Fascicles 3 to 6 for £12.00 (Buy 3, get one free!). Price to non-members is £6.00 per fascicle. Postage and packing £8.50 UK, £25.00 overseas.

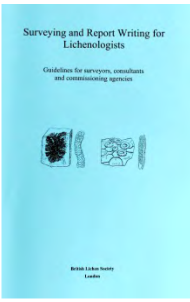


Cat.8. Microchemical Methods for the Identification of Lichens by A. Orange (2010)

2nd edition, with two colour plates. Full of useful information on pigments, crystals, colour tests with reagents and TLC. Being reprinted, available July 2013. Price £9 members, £11 non-members.

Cat.9. Conservation Evaluation of British Lichens and Lichenicolous Fungi by B.J.Coppins and R.G. Woods (2012)

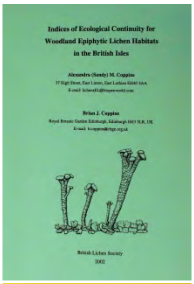
An update and revision of the 2003 edition and now extended to include lichenicolous fungi. Provides a comprehensive catalogue of threat statuses. Also included are lists of specially protected species in England, Scotland and Wales and those species for which Britain has an internationally important population. It now no. 13 of the JNCC's Species Status volume series. A4 paperback 155pgs. £7. Postage and Packing £5.00, £12.50 overseas.



Cat.10. Surveying and Report Writing for Lichenologists Ed. D.J. Hill (2006)

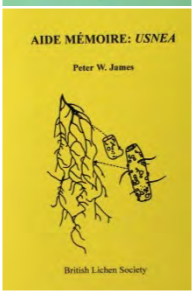
Guidelines on commissioning surveys, fieldwork, identification and report writing, aimed principally at those people and organisations commissioning surveys and at those undertaking them. However, much of the information is of value to any lichenologist engaged in field recording.

BLS members £7.00; non-members £10.00. Postage & Packing £2.50 UK, £6.50 overseas.



Cat.11. Indices of Ecological Continuity for Woodland Epiphytic Lichen Habitats in the British Isles by A.M. and B.J. Coppins (2002)

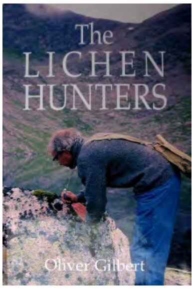
The use of lichens as indeces of ecological continuity in British Woodlands was pioneered by Dr. Francis Rose MBE. The indices he proposed are here updated and regional variations are explained. BLS members £2.00; non-members £5.00. Postage & Packing £2.50 UK, £6.50 overseas.



Cat.13. Usnea 'Aide Memoire' by P.W. James

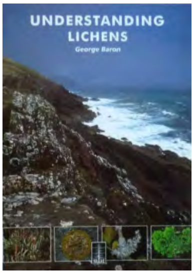
A5 booklet with drawings and many useful tips for identifying the British species of this difficult genus.

BLS members £2.00 ; non-members £3.00. Postage & Packing £1.50 UK, £2.50 overseas.



Cat.14. The Lichen Hunters by O.L. Gilbert (2004). Hardback, 208pp.

If you have been on any lichen field meetings in the last fifty years, this is a book you will enjoy. The late Oliver Gilbert's boundless enthusiasm comes across in every page as he describes field meetings and explorations around Britain. Many past and present members of the Society are fondly remembered in this delightful book. Special price, now £6.00. Postage & Packing £4.50 UK, £10.50 overseas.



Cat.15. 'Understanding Lichens' by George Baron (1999). Paperback, 92pp.

An excellent introduction to lichenology, from the basic biology of lichens to their environmental importance as well as the history of the science.
BLS members £8.95; non-members £9.95. Postage & Packing £2.50 UK, £6.50 overseas.

Cat. 16. A Field Key to Common Churchyard Lichens by Frank Dobson (2003)

Spiral-bound book with strong paper. Illustrated keys to lichens of stone, wooden structures, soil and mosses. 53 colour photographs. Covers many common lowland lichens.
BLS members £6.50; non-members £7.50. Postage & Packing £2.50 UK, £6.50 overseas.

Cat. 17. A Field Key to Coastal and Seashore Lichens by Frank Dobson (2010)

A superb guide to over 400 species. 96 colour photographs. In the same format as cat. 16.
BLS members £10.00; non-members £12.00. Postage & Packing £2.50 UK, £6.50 overseas.

Cat. 18. A Field Key to Lichens on Trees by Frank Dobson (2013)

A superb guide to around 500 species. 96 colour photographs. In the same format as cat. 16.
BLS members £15.00; non-members £17.00. Postage & Packing £2.50 UK, £6.50 overseas.

Cat. 21 and 22. Lichen Wall Charts illustrated by Clare Dalby. Two beautifully illustrated wall charts, **'Lichens on Trees'(cat.21)** and **'Lichens on Rocky Seashores' (cat.22)** have been produced by artist Clare Dalby. Each is A1 size (80cm wide x 60cm high) and feature over 40 species in colour, nomenclature updated to 2010.

£5.00 per poster, £4.00 per poster for purchases of 8 or more. Postage & Packing (for up to two posters) £3.00 UK, £6.50 overseas.

Cat.23. Parmelia identification CD-Rom
Although the nomenclature has been superceded, this CD provides a useful range of photographs and other information for identification.
BLS members: £5.00; non-members £7.00. Postage & Packing £2.00 UK, £5.00 overseas.

Cat.24. Lichen Identifier CD-Rom
This is a simple to use multi-access computer key that enables the user to find the species name and characteristics of most British and Irish lichens. It is divided into field and microscopical characters and any information available may be entered in any order to obtain a solution. With the majority of species, a few characters, noted in the field, are sufficient to identify the species. A brief note on each species further assists separation of similar species. It was originally based on *The Lichen Flora of Great Britain and Ireland* by O.W. Purvis et al (1992). It includes every species mentioned in that book plus many that have been more recently described or added to the British list. The nomenclature agrees with the most recent version of the BLS checklist. It can therefore be used to identify any of the lichens contained in the above *Flora*. In addition, it includes many species that have been added to the British and Irish lists since that time.

Lichen-Identifier will run on a PC with a 486 DX or later processor running Windows NT, 95, 98, 2000, XP, Vista and Windows 7. We regret that it is not available for Apple Mac except under PC emulation or 'Boot Camp'.

Improvements in Version 3 of *Lichen-Identifier* include: Completely revised data, where possible, using the completed sections of the new Flora, plus many recently described species. The conservation evaluation from *A Conservation*

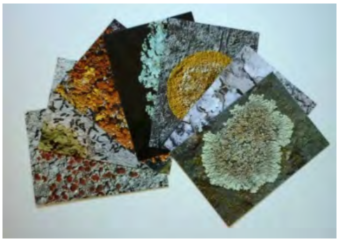
Evaluation of British Lichens is given for each species. Over 750 colour photographs of improved quality with a scale added to each. Every map has been updated and maps of lichenicolous fungi are included, although these are not part of the actual key.

Please note that this program includes a DataPower 2 reader which will run on an individual computer. It will not run on a multiple system in client/server mode. If you are using a server system, a site licence for DataPower 2 is required.

BLS members £26.00 for version 3, (£15.00 for upgrade from version 2).
Non-members £28.00 for version 3, (£15.00 for upgrade from version 2).
Postage & Packing £2.50 UK, £6.50 overseas.

Cat.25. Greetings Cards/Notelets by Claire Dalby

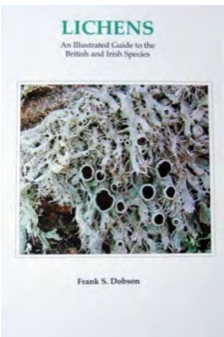
A set of five cards with envelopes, featuring five exquisite pen and ink illustrations of British lichens.
£2.00 per set. Postage & Packing £2.00 UK, £3.50 overseas.



Cat.26. BLS Postcards

A set of 16 beautiful photographic postcards of British lichens.
£2.00 per set. Postage & Packing £1.50 UK, £3.00 overseas.

Cat.27. Woven ties with below-knot motif of BLS logo. Attractive ties with discreet BLS logo. Colours available: maroon, navy blue, brown, black and gold.
£7.00. Postage & Packing £1.50 UK, £3.00 overseas.



Cat. 29. Lichens – An Illustrated Guide to the British and Irish Species 6th Edition (2011)

This latest enlarged edition (496pp) of this popular book provides an invaluable guide to identifying the British and Irish species, both for the beginner and the more advanced lichenologist. With detailed air pollution references and distribution maps, it offers the environmentalist and ecologist a concise work of reference, compact enough to be used in the field.

The 6th edition has been revised to conform with the nomenclature of 'The Lichens of Great Britain and Ireland' ed. Smith, C.W. et al. (2009) and more recent changes. Over 160 additional species to the previous edition have been added so over 1,000 species are now treated.

Entries usually consist of a description of each species, a photograph, notes on habitat, chemical tests, line drawings to clarify the description and a distribution map giving three date separations.

There is an enlarged generic key and a much extended section on sterile species. A generic synopsis is included to assist the more experienced lichenologist. Paperback £35.00, hardback £50.00. Postage & packing £7.00 UK, overseas £10.00.

NEW MEMBERS since publication of the 2013 Summer Bulletin

Welcome to the following new members of the British Lichen Society …

Miss V.L. Barnes, Woodcroft, Penwarne Road, Mawnan Smith, Falmouth, Cornwall, TR11 5PQ, UK

Ms R. Belinchón Olmeda, Royal Botanic Garden Edinburgh, 20A Inverleith Row, Edinburgh, SCOTLAND, EH3 5LR, UK

Dr C.A.J. Brightman, The Grange, Hall Street, Wellingore, Lincolnshire, LN5 0HU, UK

Mr P.T. Burniston, 139 Sandringham Drive, Leeds, West Yorkshire, LS17 8DQ, UK

Revd J.P. Clarke, 16 Howford, Inverurie, Aberdeenshire, AB51 4DL, UK

Ms S. Craske, Unit 2, St Lawrence Industrial Estate, Manston Road, Ramsgate, Kent, CT11 0QZ, UK

Mr C. Darvill, Dept of Geography, Durham University, South Road, Durham, County Durham, DH1 3LE, UK

Ms J. Fiorentino, 110 Kananea Street, Attard, ATD 2703, MALTA

Dr J. Fisher, 24A Nelson Street, Edinburgh, SCOTLAND, EH3 6LJ, UK

Lady V. Getty, Manor Farm, Ibstone, High Wycombe, Buckinghamshire, HP14 3YD, UK

Mr B. Gibson, The Brotherhood Church, New Road, Stapleton, Pontefract, North Yorkshire, WF8 3DR, UK

Dr S. Hancock, 5 Woodland Road, Halesowen, West Midlands, B62 8JS, UK

Dr D. Healey, Bracklinn, Golf Road, Felixstowe, Suffolk, IP11 7NG, UK

Dr N.F. Higgins, School of Life Science, University of Nottingham, Nottingham, Nottinghamshire, NG7 2RD, UK

Mr R.L. Johnson-Taylor, 95 Downland, Two Mile Ash, Milton Keynes, Buckinghamshire, MK8 8JY, UK

Mrs A. Jones, Elm Cottage, Grafton Flyford, Worcester, Worcestershire, WR7 4PG, UK

Mr D. Lamacraft, Awelon, Neigwl, Botwnnog, Pwllheli, Gwynedd, WALES, LL53 7SS, UK

Ms M. Maslac, Vrapcanska 175/2, HR-10 090 Zagreb, CROATIA

Mr M.S. Zuppone, 42 Connaught Road, Reading, Berkshire, RG30 2UP, UK

OBITUARY

Sadly we have to inform you that the following members of our society have passed away:

Mr F.G. Jones, Bryn Ogwen, 10 Rhes Jams, Braichmelyn, Bethesda Gwynedd, Wales, LL57 3RA

Prof. Rolf Santesson (1916-2013) died on 17 September at the age of 97. Rolf's contribution to lichenology was outstanding, especially to tropical South American genera and above all through publication of his book Foliicolous Lichens (1952). In 1973 he became Professor and Head of the Botanical Section of the Natural History Museum in Stockholm, eventually retiring in 1982. He continued working actively, publishing the *The lichens and lichenicolous fungi of Sweden and Norway* in 1993 with a further edition in 2004. He was one of the first recipients of the IAL's Acharius Medal, and was an honorary member of the British Lichen Society. A full obituary will appear in due course.

THANK YOU

for kindly supporting the British Lichen Society with a donation: Mr H. Walther, Ms C Lycett Green.

Membership Matters – from the Membership Secretary

Reminder - Information you will find in the top left corner (below the 'return address') on the envelopes in which you receive the Bulletin:

1. Membership number. This is a four digit number only.

2. Expiring year. This will show any credit you may still have for following years.

Please, keep us up to date when your contact details change! Please, also remember to inform the membership secretary when your email address changes.

Members only content on our web site. This has not yet been rolled out. You will be contacted by us with your account details once this is available, and you will be provided with an update privacy statement.

Review of membership categories and online membership administration. This is work in progress, and if ready in time for the next AGM you will be contacted individually by mail.

For your **2014 renewal** please remember that subscription changed this year for some membership categories - details, please refer to the inside back cover. If you pay your fees from a UK bank account by Standing Order, please remember to inform your bank and update your Standing Order Mandate!

Publication of the Summer 2014 Bulletin

Copy for the Summer 2014 Bulletin should reach the editor (contact details on the inside front cover) by 1 May 2014

British Lichen Society Bulletin no. 113
Winter 2013

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