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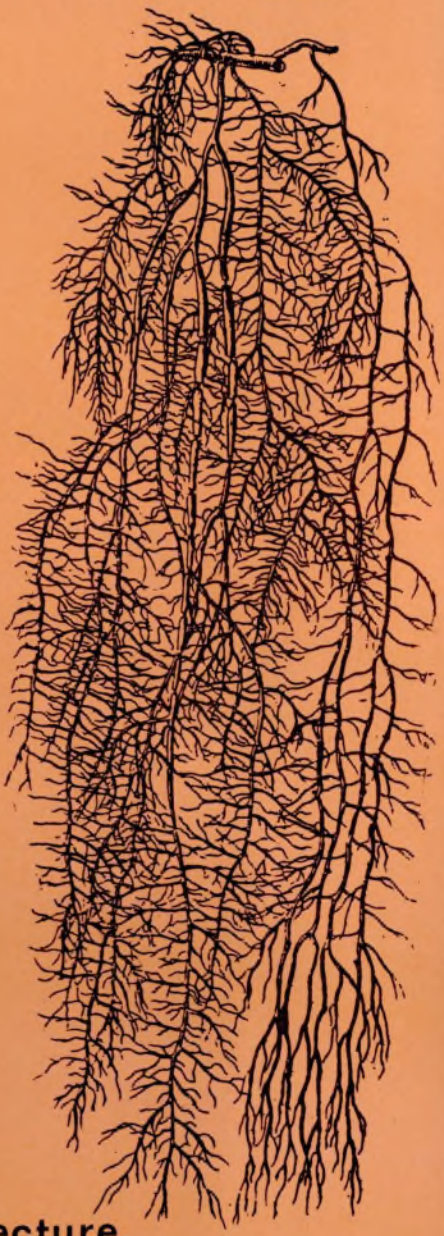
BRITISH LICHEN SOCIETY BULLETIN



YELLOW RHIZOCARPON

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BRITISH LICHEN FLORA UNDERWAY

Last year an application was sent to the Natural Environmental Research Council requesting funds for the production of a British Lichen Flora. The aims were summarised as "Production of a diagnostic flora for the identification of lichen-forming fungi including all 1600 species recognised in Britain and Ireland incorporating keys and notes on the character, ecology and distribution of the species treated". A grant of just under £45,000 spread over three years was awarded. The last attempt at a full treatment was published in 1918-26, and while this, and particularly more recent identification books such as Duncan & James 1970, have served us well, some deal with less than half the British species and all are now somewhat out of date.

The application has been prepared by Professor David Moore of the University of Reading and Professor David Hawksworth. Professor Moore, a very experienced taxonomist and flora compiler, will supervise the work in consultation with David Hawksworth, Peter James and Brian Coppins. The bulk of the grant will be spent on employing a post-doctoral research assistant who will do most of the day-to-day work on the flora. Money will be provided for travel to and periods at the British Museum (Natural History) and the Royal Botanic Garden, Edinburgh, so experienced lichenologists such as Peter James and Brian Coppins, will be thoroughly involved in the production. Mark Seaward will provide up-to-date information on distributions from the BLS mapping Scheme. The BLS has established an Advisory Group of eight members (including amateurs) to assist with the project by testing draft accounts as they are produced and to contribute their own data as appropriate.

The need for a new British lichen flora and the reason why now is a particularly opportune time to proceed can be summarised under two headings "scientific" and "practical".

Scientific Justification

1. Comprehensive modern treatments for the British Isles covering most major botanical groups already exist or are in preparation but the last attempt at a full treatment of the lichens was over sixty years ago.

2. Increased understanding of the identities, ecology, distribution and physiology of lichens, particularly over the last ten years, has led to their wide use in pure and applied biology. This has created a high demand for a comprehensive lichen flora.

3. Lichens are now employed as monitors of air pollution (gaseous and acid rain), eutrophication, heavy metal and radionuclide deposition; indicators of ecological continuity in woodlands, in the dating of rock surfaces, and as experimental objects for the study of the physiology and metabolism of symbiotic systems and nitrogen-fixation. They are also a rich source of secondary metabolites unknown in other groups; some of these are biologically active and have potential medical applications. The need for accurate identification of material has therefore never been higher.

4. They also have importance in ecological survey work and the assessment of the relative scientific interest of particular sites; their contribution to conservation work is being increasingly recognised by bodies such as the Nature Conservancy Council. No site description can be considered complete unless the lichens have been included.

5. Accuracy of identification is crucial in all areas where lichens are used. A substantial amount of published work is suspect or of very limited value because of uncertainties surrounding identification. A comprehensive, widely available, authoritative flora is the key to ensuring accurate identification. Currently this facility is lacking in Britain.

6. The production of a new lichen flora is a natural outgrowth of essential background studies on the literature (Hawksworth & Seaward, 1977), distributional studies (Seaward & Hitch 1982), and the production of detailed checklists of species reported (Hawksworth, James & Coppins, 1980; Cannon, Hawksworth & Sherwood-Pike, 1985), together with the steady flow of important taxonomic revisions during the last 15 years.

7. The Department of Botany in the University of Reading has unparalleled experience in the writing of floras and Professor Hawksworth has been actively involved in building up the database on which the flora would be founded. The combination of this

experience with the taxononic expertise of other leading UK workers, particularly Mr P.W. James (British Museum) and Dr B.J. Coppins (Royal Botanic Garden, Edinburgh) provides a unique opportunity to produce a lichen flora which would also be of value throughout much of Europe.

8. Such an opportunity is unlikely to recur for many years due to (a) the increased pressures on Professor Hawksworth's time, (b) the approaching retirement of Mr James, (c) an eminently qualified research assistant (Dr William Purvis) being now available (profile on page 17) and (d) the current high level of interest in the group to ensure assistance in testing drafts, etc. This view is endorsed by all leading workers in the field.

Practical Justification

As well as being scientifically desirable a new flora will make lichenology that much more enjoyable. At the moment naming collections is a slow, inconvenient and at times dispiriting experience as it involves using out-of-date, incomplete floras or laboriously translating foreign keys. Lingering uncertainties frequently remain so the specimen has to be passed to a referee. Frustrations of this sort may be one of the reasons why so much largely undeserved attention has been paid to areas of Britain where the lichen flora is attenuated by pollution - at least few unknowns will be encountered. It is extremely difficult for amateurs to gain an understanding of lichens which exceeds the literature, as much lichen 'know how' is passed on by word of mouth among a very small circle. It needs committing to paper or what happened in the 1920-1955 period, when the ability to name lichens all but died out in Britain, could happen again.

Format

This involves looking some way ahead but currently it is considered that an alphabetical arrangement of genera will be most acceptable. Newly prepared line-drawings of important diagnostic features will be provided wherever appropriate. Much new data will be included, such as a reassessment of spore size, information on secondary metabolites and a description of anamorphous states.

It is expected that the work will run to about 500 pages and become available around the end of the decade.

Progress to Date

So far there has been general agreement on the layout of generic accounts, species descriptions and the format of keys. Terminology is being standardised. Many of the genera which are expected to be problematical have been assigned so individuals can start work on them straight away. By autumn it is hoped that draft accounts of all British macrolichens will have been prepared. Opportunities will be provided to test them on BLS field meetings, lichen courses at field studies centres, etc. An extremely tight production schedule has been drawn up which aims at completion in 1989.

REPORT ON THE NEW YEAR MEETINGS, 10-11 JANUARY 1986

The Conversazione was well patronised, the Book Auction raising £266.75 for the society. Claire Dalby's cards were in great demand, their sale bringing in a further £100.

Forty people attended the AGM. This started with members standing in memory of Ursula Duncan, then went on for over 1½ hours, much time being taken up by officers' reports. Tim Moxham was elected secretary in place of Joy White and Vince Giavarini is taking over from Tony Fletcher who, in five years made the Conservation Committee highly effective and nationally respected. Barbara Benfield, Prof. D H S Richardson and F Joy White were elected onto Council, and Prof. Rolf Santesson to the rank of Honorary member. Prof. David L Hawksworth will be guiding the progress of the society as President for the next two years with Dr Brian Coppins as Vice-President.

Report on the Lecture Meeting: 'Lichens as Environmental Indicators'

A summary of the papers delivered is given below together with the President's introduction.

Introduction - J R Laundon

A few years ago when I was a schoolboy it was common knowledge that lichens were the only living organisms occurring on the planet Mars. They covered large areas and were visible with telescopes from the Earth. Unfortunately the actual species involved could not be established at this distance. In the early sixties the Russian government sent a scientist to work for several months with Peter James and myself at the museum here because it considered that a knowledge of lichens was essential for space exploration. Incidentally, there were rumours that our Russian visitor was in fact a spy and he was indeed followed about by British Intelligence. Thus in those far-off days of early space travel, lichens were already recognised as important environmental indicators, even by Politbureau.

Today the overwhelming economic importance of lichens is still their use as biological indicators. Their presence or absence tells us things about our environment that cannot be readily detected by other means. The epiphytes on a tree trunk are a measure of the local air pollution, and also of the history of the woodland in which the tree grows. However, it must be remembered that other groups are also indicators. For example, the flowering plant, Mercurialis perennis - dog's mercury, in the bottom of a hedge may indicate the site of an old wood. Birds, especially, are habitat indicators, and one has only to look at a list of birds observed in a place in order to note the types of habitats present. Thus a species list of dipper, grey wagtail, mallard, and moorhen tells us that we are in a fast-flowing river with a clear, stony bottom. However, the river is readily observed and felt, especially if one falls in, whereas lichens are important for detecting conditions that might otherwise not come to our notice. This is fortunate in the present economic climate, because it enables lichenology to attract large sums of money for research.

Today we are looking at four aspects of lichen indicators: alkaline dust, acid rain, metal-rich rocks, and the dates rocks become exposed. Oliver Gilbert is one of the great pioneers of air

pollution studies, as well as an old friend, and it gives me great pleasure to introduce him to speak on the use of lichens for monitoring alkaline dust.

The use of lichens for monitoring alkaline dust

Oliver Gilbert described the zonation of epiphytic lichens which develops round cement works and limestone quarries. The presence of a ubiquitous Xanthorion community containing a number of normally saxicolous lichen species, growing on bark with elevated pH, characterises areas of appreciable dust contamination. Four or five zones can usually be recognised. Sometimes it is possible to detect whether the dust nuisance is abating by observing the pattern of colonisation on adjacent asbestos roofs.
As standard dust collection gauges are particularly inefficient monitors, lichens can play a valuable role in determining patterns of alkaline dust deposition and have been used to help settle a legal dispute.

Acid rain, a complex problem

Speaking on this topical subject Peter James started by stressing its complexity and the likely role of ozone. He then suggested that the loss of Cladina stellaris from the Scottish Highlands might be due to a slight shift in the acidity of its habitat. Field workers in Scotland and the north of England have for some time been aware that the Lobarion is declining on poorly buffered, acid-barked trees such as oak in areas where primary air pollution is low. Micarea-rich communities may replace those containing cyanophilic lichen species. He pointed out that there is much confusion between the (toxic) effects of mild SO_2 pollution and the depression of bark pH by acid rain. Future areas of study should include looking out for malformations which might indicate lichens under stress and collecting further data on the 'Laundon Syndrome', whereby existing populations can survive but new ones are unable to establish themselves.

Lichens on copper-rich rocks

William Purvis described how lichens can help identify ore bodies rich in copper. The most striking effect is that a number of lichens

turn green due to an accumulation of copper-containing substances. This is particularly the case with species containing norstictic or psoromic acids which form coloured complexes with the metal. A new community restricted to copper-rich substrates - the Lecideetum inopsis - was described. It has so far been noted in Norway and the English Lake District, where it is a feature of rocks containing the copper carbonates azurite and malachite. Where iron pyrites is associated with copper, acidity produced by the weathering sulphides (down to pH2) often masks the copper effects and the rusty coloured Acarospora sinopica becomes abundant.

Lichenometry: an outline of potentialities and limitations

Michael Proctor started by paying tribute to the pioneering work of the Austrian lichenologist R E Beschel. Limitations to the technique of lichenometry involve the presence of erratic lichens, fused thalli, thalli trapped in mosaics, reliance on field identifications, and the unknown time-lag before initial colonisation occurs. Despite these drawbacks the technique produces meaningful results provided it is not regarded as an exact science. His experiences in the Alps had taught caution in relying on maximum thallus size; a selection of the larger thalli should be measured at each site. On the analytical side more work is required on lichen growth curves and studies should extend beyond the yellow Rhizocarpon spp. The conclusion seemed to be that absolute dating will never be on, but useful comparative dating can sometimes be achieved.

For the first time in living memory, this was a real Exhibition Meeting with a number of contributions of high lichenological interest.

The following exhibitors are congratulated:-

ANON	Aromatic Lichens. Two new species discovered. Pot-pourri national-trustensis sp.nov. Pot-pourri aberdeenii-callunae sp. nov. Habitat: up-market shops on both sides of the Atlantic.
BROWN, D.H.	B.L.S. Library Catalogue: complete print-out (5cm thick) and examples of word searches.

CLAYDEN, S & PENTECOST, A.	The Rhizocarpon geographicum group in North Wales. Fifteen named examples of this complex including one with an orange hue believed to be the result of ferric iron accumulation.
DALBY, C	Progress with the Maritime Lichens Wall Chart. Superb artwork and tantalising mock-up of the final design which should be out next year.
DALBY, C & DALBY, K	Umbilicaria hirsuta new to Scotland. Specimens from Norway, North Wales and Scotland shown side by side, displayed a considerable range of variation.
HAWKSWORTH, D.L.	Two new Mycomicrothelia spp. from the British Isles. Specimens on display.
HAWKSWORTH, D.L.	Developing a new classification for the Ascomycetes. Outline diagram.
RICHMOND PUBLISHING	Bookstall.
ROSE, F & ELLIOT, E.	Wiltshire lichen records. Progress report and sample of page layout.
SEAWARD, M.R.D.	Indian take-away. Examples of lichens recently bought from street traders in India who sell them as a basic ingredient of curries.
WHITE, F.JOY	Dulverton Field Meeting. Four colour photos of lichenologists at work.
WOODS, R.S.	The lichenological interest of sites in Mid-Wales. Examples of unusual lichens, including Catillaria bouteillei from the exhibitor's garden.

Advanced Notice:three days of meetings 19 - 21 February 1987

The date of the Annual General, Lecture and Exhibition Meetings has been moved from its normal time in early January so that it coincides with an important international meeting 'HORIZONS IN

LICHENOLOGY' which the BLS is organising jointly with the Linnean Society of London. To provide members with advance notice of these meetings an outline of the arrangements is given below.

Thursday 19 February 1987 10.00 - 17.00
HORIZONS IN LICHENOLOGY (at the Rooms of the Linnean Society, Burlington House, Piccadilly, London, W1V OLQ).
Invited papers, many by international figures, will cover growth points in Lichenology with emphasis being given to areas of significant recent study. The provisional programme will include aspects of thallus growth, pollution sensitivity, chemical variation, and the fungus-algal association in its evolutionary perspective. Geographical studies will include Southern Hemisphere macrolichens and oceanic communities in Europe. The ecology of foliicolous lichens will also be treated.

There will be an inclusive charge which will cover the cost of refreshments during the day. The meeting will end with a Dinner under separate arrangements.

Applications for further information should be sent to the Linnean Society at the above address and be accompanied by a self-addressed envelope. Details will be despatched as soon as they are available.

Friday 20 February 1987 10.00 - 16.00

VARIATION IN LICHENS (at the Rooms of the Linnean Society, Burlington House, Piccadilly, London).
This will be an informal meeting within a framework of three or four invited papers. The rest of the time will be devoted to short contributions (10-20 mins) from members on subjects of general lichenological interest which it is hoped will lead to active discussion. Please start thinking now about whether you could participate in these proceedings and contact the convenor Dr D.H.Dalby, Department of Biology, Imperial College, London, SW7 2BB.
In the evening there will be a Buffet Dinner probably linked to a book auction.

Saturday 21 February 1987 10.30 - 17.00

ANNUAL GENERAL AND EXHIBITION MEETINGS, PLUS FLORA WORKSHOP (at British Museum (Natural History), South Kensington).
This will be the Saturday series of meetings which is usually held in early January. In place of the afternoon lectures there will be a Members Slide Show and a 'Flora Workshop'. Organiser T.H.Moxham.

Further details of all these meetings will appear in the next Bulletin; for now reserve the dates.

London accommodation - Horizons in Lichenology, February 1987

BLS members wishing to attend both the AGM and the meetings mentioned above and who may experience some difficulty in securing accommodation in London for the period of the meetings are asked to contact Dr D.J.Galloway, Department of Botany, British Museum (Natural History), Cromwell Road, London SW7 5BD, who will endeavour to arrange suitable billets with BLS members living in, or close to, London. It is likely that places may be limited so please book early to avoid disappointment.

LICHENOLOGIA

Down at the Lizard a dozen members of the Lichen Society, led by Oliver Gilbert and guided by Peter James, recorded the lichens that grow there from Absconditella at the beginning of the Check List to Xanthoria nearly at the end. Copper minerals in the rocks accounted for at least one species new to the British flora and a beautiful emerald green Acarospora. Next year the Bryological Society proposes to attempt to write a Bryophyte Flora of an island in a week; the Lichen Society has shown the way by compiling an ecological flora of a peninsula in six days.

In London at the beginning of the year Jack Laundon, having presided over the annual general meeting urbanely, but with a firm grasp of necessary detail (I cannot remember a Lichen Society AGM

that was better conducted), continued to hold our attention in the afternoon with revelations about his past. It appeared that in his comparatively early days in the lichen section at the Museum the Soviet Union sent an astronaut-in-training to the department to learn about the lichens that were thought to grow on Mars and possibly, on the moon, or who knows, drifting unattached in space much as Masonhalea richardsonii does on the North American tundra. This would have been at about the time that the science fiction writer John Wyndham (real name J.B.Harris) produced what is arguably his worst novel entitled Trouble with lichen (1963).

It may seem strange to European lichenologists that a specimen collected in California in 1913 of the to them familiar and distinctive lichen Diploicia canescens should have been misidentified as Pyxine sorediata. This came to light recently when the species was found growing in the grounds of the Santa Barbara Museum of Natural History. D.canescens was immediately claimed as "new to the United States" but in fact Bill Weber and Rolf Santesson had previously collected it in Morro Canyon California in 1966 growing on an elder tree. It seems inappropriate in an article of this kind (intended to be the first of a series unless there is a public outcry against this) to provide a list of references, but readers who require "chapter and verse" for any of the facts stated will willingly be given further details on application through the editor. No prizes are offered however for guessing which newspaper headlined its report of the award to Mark Seaward of a Nummo Aureo by Wroclaw University "The Golden Mark".

Most of us would regard Scoliciosporum chlorococcum as a corticolous species, but Pauline Topham and Chris Hitch found it growing abundantly on a sandy beach at Tentsmuir Point in Fife. This reminded me of Holmes' record more than a hundred years ago of Lobaria pulmonaria growing at Lydd Beach in Kent. He said he found it on sandy ground covering nearly an acre. Why it was growing on sand is not clear; the Scoliciosporum was associated with the bases of marram grass tufts, but the Lobaria was not. since a number of lichens found by Holmes at Lydd are still there, perhaps L.pulmonaria in this locality was an early victim of acid rain.

I was concerned when I heard that VINIFERA was giving up writing

his distinctive articles, and more so when I learned that I was elected to produce something to take their place, but it appears that he felt that he could not continue indefinitely. His pseudonym implied that he was not merely connected with, but actually was a grapevine; but had it any relevance to lichens ? There is a species called Lecanora vinetorum. It grows only on the wooden frames supporting vines at Uberetsch in the South Tyrol (actually in Italy). These frames are sprayed with a modern equivalent of Bordeaux mixture at monthly intervals, but the lichen seems to thrive on this and in fact accumulates copper. It is all to do with a unique lichen substance called vinetorin. Lichen chemistry has come a long way since such substances were thought of mainly in terms of colour reactions and dyes; that was where I started, and so it seems appropriate to sign myself

CUDBEAR

Country Diary - West Lancashire

The lack of green on the O.S. maps of Lancashire does not augur well in the search for epiphytic lichens. The whole of the county contains only 3.2% woodland with areas like the Fylde having a mere 1%. Faced with these dire statistics the hunt for 'likely' woodland sites is often a frustrating task. Last July, accompanied by a fellow enthusiast, I chose a wood in Roeburndale 12 kilometres east of Lancaster, a valley dissecting the acid moorlands between the Ribble and the Lune. Perhaps the sheltered valley would provide a break in the corticolous monotony of much of Lancashire where even Lecanora chlarotera is uncommon.

A broken fence with the distinctive pycnidia of Micarea denigrata invited access and the rather open fringes revealed only common species, Parmelia saxatilis, Hypogymnia physodes and Platismatia glauca. But soon an oak bearing abundant Usnea subfloridana and sheets of Lecanactis abietina was found followed by Thelotrema lepadinum heralding what we hoped would be a worthwhile wood. Soon the valley became a narrow gorge with oaks, sycamores and ashes and further common species were added. But a large oak in the valley bottom carried Arthonia spadicea and A.vinosa and

these were followed by abundant Micarea adnata on an inclined mossy oak trunk. All three are not at all common in Lancashire, the latter species has very few dots in England and any old forest indicators are exciting finds. By clinging to the steep valley side a stump bearing distinctive black patches and domed fruits came under the hand lens and they proved to be Micarea melaena.

The climb out of the valley was marked by a decrease in lichen diversity with Mycoblastus sanguinarius on oak, and on the valley shoulder exposed to any pollution M.sterilis occured on the boughs of several trees. In all, the wood contained 37 corticolous species, no comparison with the Lake District or the parklands of southern England but a good tally for V.C.60.

But the best was yet to come. To finish the day the Carboniferous rocks in an open part of the same valley were given a brief examination. The soft shales proved too friable for lichen colonisation but the sandstones bore sheets of Trapelia placodioides on vertical joint faces and on a horizontal bedding plane the distinctive Rhizocarpon concentricum occurred, an indication of the calcareous nature of many of the sandstones of the Carboniferous. The exposed rocks in the river bed supported few lichens but Verrucaria hydrela and the creamy thallus of V.praetermissa were nice finds. One sandstone face revealed minute, black perithecia - one for the microscope. Back at base the one-septate spores indicate a Thelidium but the keys don't help and the species is a mystery. Some time later the packet is returned from Edinburgh identified as Thelidium margaceum a rare lichen of more or less inundated siliceous rocks and a real lichenological highlight on which to end the day.

The final tally was over 50 species and several new vice-county records together with the realisation that the scattered wooded gorges of Bowland may yet yield interesting corticolous lichens.

MIKE GOSLING

LICHENIZED GOD

This lichen-covered God is one of the lost statues of Stowe, Buckinghamshire. Following the great sale in 1921 the whereabouts of the statues was not known till Susan Moore recently discovered them in Hampshire. The photo, by Jonathan Gibson, is reproduced by courtesy of Country Life.

Indian Take-away.

During a recent visit to India I explored the markets in Aurangabad and Puna, and was astounded by the number of shops and street traders selling lichens as a basic ingredient for curries. Lichens or dagadful (meaning "stone flowers") are added to the spice component (presumably to bulk out and enhance it) and are sold in relatively large quantities to consumers: hundreds of grams costing the equivalent of only a few pence. One such purchase was displayed at the BLS Annual Exhibition Meeting; it consisted mainly of Parmelia tinctorum, P.nilgherrense, P.reticulata and P.sancti-angeli. However, I was informed that Ramalina and Usnea spp. are also collected for the same purpose. Prepacked spices 'Kubal Garam Masala' were also displayed; these contained dagadful as a principal ingredient.

Curries are basic to the diet of a very large population; the demands made on the macrolichen flora, which is poorly represented over wide areas of the Indian sub-continent, must place a heavy burden on a diminishing natural resource. In addition to local demand, increasing quantities of these spice mixtures are being exported to cater not only for immigrant Asians but also to a growing western interest in Indian food (mixtures containing lichens are now widely available in many British cities).

In view of the quantities involved, it may well be that this is the major economic use of lichens in the world today. The quantity and quality of species collected, the method of harvesting, recovery of lichen populations, etc. therefore require detailed investigation.

M.R.D.SEAWARD

Etymological notes on lichen names. Part 1

Fine taxonomists, when naming the quarry they have so expertly brought to bay, do not always trouble to explain the whys and wherefores of their nomenclatural choices and coinages to the rest of the world. Even workers in the same field can be ignorant of the connotations and sources of particular names. Add to this the obstacle course which the use of Greek and Latin roots constitutes for those unversed in the classical tongues, and it is easy to see

why many lichenologists leave well alone. Yet, an etymological glossary of lichen nomenclature would be a cornucopia teeming with information on the appearance and habitats of individual lichens and with many items of scientific-historical and aesthetic resonance, some of them engagingly quirky. This series of notes aims to give some notion of the delights to be found within that horn of plenty.

1. Acarospora sinopica With extremely short mite-like spores, associated with sinopite.

   Derivation: akares (Greek) = very short (NB Late Latin acarus = a mite or tick),(of hair) too stubbly to be cut.
   spora(Latin) = spore, seed.
   sinope (Greek) = Sinope, the Greek colony in Paphlagonia on the Black Sea, whose inhabitants use the friable, red clayey earth (sinopite) which occurs there, for a paint.

2. Bacidia sabuletorum With small, fleshy, berry-like fruits, on sandy, gravelly places.

   Derivation: baca (Latin) = a small, roundish fruit or berry (used also of a variety of things similarly shaped, e.g. a pearl, goat-dung). There is a common, later form, bacca, of the same word.
   -idium (Greek diminutive suffix) = little.
   sabuleta (Latin, plural) = sandy areas. Latin sabulum = coarse sand, gravel.

3. Caloplaca teicholyta A beautiful, flat plate, destructive of walls.

   Derivation: kal(l)os (Greek) = beautiful, pretty
   plax (Greek) = a flat surface, a plaque, (New Testament) a stone tablet.
   teichion (Greek) = a wall
   oleter (Greek) = a killer, destroyer.

4. Cladonia coccifera Branching, bearing carmine grains or berries.

Derivation: klados (Greek) = a sprout or branch.
kokkos (Greek) = a kernel or grain, or the female cochineal or kermes insect, providing a scarlet dyestuff and once considered to be a plant grain or berry.
-fer (Latin suffix) = bearing, carrying.

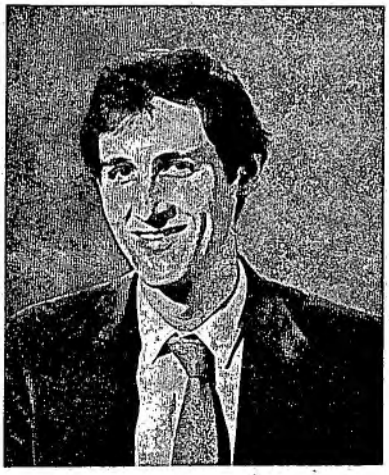
5. Parmelia sulcata A small round, furrowed shield.
Derivation: parma (Latin) = a small, light, round shield.
sulco (Latin) = I furrow, turn up, plough.

6. Scoliciosporum umbrinum With spores like worms, and of umber hue.
Derivation: skolex (Greek) = a worm
spora (Latin) = a seed, spore.
umbrinus (Latin) = brown, umber.

7. Stereocaulon nanodes Solid stemmed, tiny as a dwarf.
Derivation: stereos (Greek) = solid, firm.
kaulos (Greek) = a spear-shaft, a plant stalk.
nanos (Greek) = a dwarf, midget.
-odes (Greek suffix) = like, resembling.

A.HENDERSON

Ole William Purvis



After an interview in early February, Dr William Purvis was appointed as post-doctoral research assistant to work for three years on the production of the new British Lichen Flora. Currently 26 years old, William has been aware of lichens since he was very young. He can remember at the age of 12 being challenged for trespassing in a wood whereupon he explained to a surprised land-owner that he was merely examining the lichens and

went on to talk about them at length. His first contact with other lichenologists came when he attended Sheffield University to study for a degree in Botany. Here William soon got into the habit of regular lichen fieldwork and on his first BLS field trip (Goatland, 1979) was responsible for the best discovery of the weekend - Cladonia fragilissima. A keen eye and an intuitive feel for lichens soon marked him out as something of a phenomenon and whilst still an undergraduate he was invited to join a number of collecting trips including a memorable expedition to investigate the lichens of Ben Alder where his knowledge of Norwegian lichens, obtained during school holidays spent in Hardanger, came in useful.

After graduating William was awarded a British Museum (Natural History) Centenary Studentship funded by BP International Ltd which involved studying the effect of mineralization on lichen communities with special reference to copper and iron minerals in Scandinavia and Britain. This meant working mainly with poorly known crustose species so a thorough training in taxonomy, including the description of new species, was obtained. He was awarded a PhD for this work, some of which has been published in the Lichenologist.

In addition to his special knowledge of lichens William is an all round botanist and an experienced alpine gardener. He is also something of a linguist and an accomplished musician, particularly on the viola. His wife, Diana, is completing her training in general practice as a doctor. Knowing them both it is difficult to say whether training as a medic or a lichenologist is the more demanding. We all wish William well in his work on the Flora.

The preparation of English orchil by George Davy in the 18th century

While Mr Cuthbert Gordon was discovering the use of cudbear as a substitute for Canary weed in the north (Bulletin 57) cloth manufacturers in Devon were thinking along similar lines. A letter sent to Mr Polwhele, author of The History of Devonshire, published in 1797, explains the process of collecting and fermentation.

Mr John Cadlick Davy, clothier of Crediton, was the person who first discovered Rock or Petrified Moss in Devon. He communicated his

discovery to his brother George in London, who procured a patent for the sole manufacturing of it into English orchil. The letter is from W.Davy, son of John Davy.

"Since my last I have had an opportunity of discovering that my father first collected moss at Sticklepath, Okehampton, and South Bovey, in the month of April 1763 and that year he got as much as

	32 tons	7 hogsheads	
1764	6 "	19 "	7lbs
1765	33 "	3 "	12 "
1766	11 "	2 quarters	5lbs
1767	3 "	14 hogsheads	1 quarter 9lbs
1768	4 "	13 "	1 " 20lbs
Total	91 tons	17 hogsheads	1 quarter 26lbs

This was nearly all that could be met with, and as it is calculated to require 50 years to produce another crop very little has since been collected. The price paid was one penny per pound and frequently in favourable weather the dexterous would, with their skinning knives, gather from 50 to 60lbs in a day. Large quantities were before this time obtained in Derbyshire and Wales for the manufacturers in this country and in Holland and two circumstances tended to procure it a ready and advantageous sale, viz. the excessive high price of Canary weed and the important discovery of a method of manufacturing the English moss into orchil so as to heighten and preserve its strength and beauty of colour, superior to any before practiced and for which a patent was granted to my uncle George in London who has almost the whole trade. Foreign weed was about this time at £120 per ton: its beauty and strength is however always two to one superior to the English in its highest state of perfection; its growth and form is also wholly different, ... the Canary grows on rocks, but from small fibrous roots, between crevices, proceed to a very short flat stalk, which produce a number of small flat (but very narrow) branches, from 1½...2 inches long, perfectly white (when of best quality) very elastic and rather fungous; the English moss, on the contrary grows parallel with the stone, adheres very close to it, and is very solid (the black and green light moss is of another quality and injurious), and it requires great care to take it off without

taking some parts of the stone with it; the sand, however, that after all will adhere to some, is not intrinsically injurious to the manufacturer only as he loses by its weight. The quality of the moss is certainly a strong vegetable alcali on which the spirits of urine so far operate as to produce a considerable fermentation (but no heat) as in some other fermentations of vegetables: the fermentation increasing in about a month the moss be-comes of a purplish hue; if the fermentation increases too rapidly, a quantity of slaked lime (and here is the acumen of the business) checks and regulates it, at the same time heightening and perfecting the beauty of its colour and in about three months it is fit to use, which is chiefly that of giving a beauty and lustre to the colour of all blue cloths, in dying crimsons and purples with other ingredients, very little being used for colouring by itself. The price of foreign weed is now as low as about £30 per ton, so that it has secured almost the whole consumption: this is I apprehend, manufactured in exactly the same manner as the English excepting that as the fermentation is not so violent and from its particular quality it does not require the assistance of slaked lime, as does the other, but as I never manufactured any of the latter, I cannot exactly ascertain whether it would not be advantageous.
Of the English I have manufactured at Fordton large quantities, and for my own manufactory am at this time making some."

(English orchil was obviously not a Roccella sp but probably the cudbear of the Leeds dyers the name of which may not have been in general use at the time of George Davy's letter.

BARBARA BENFIELD

Professor Rolf Santesson

At the Society's AGM last January, Professor Rolf Santesson of Uppsala, Sweden was unanimously elected to Honorary Membership of the Society. Although details of Prof.Santesson's contributions to lichenology over the last 50 years will be recorded in the Lichenologist, it is appropriate to record here some highlights of his career in lichenology, and also to trace the Uppsala-lineage in lichenology,

an extraordinary linking of Uppsala botanists with lichenologists from the 18th century to the present day.

Carl Linnaeus (1707-1778) named lichens in the collective genus Lichen a number of which are widely familiar to us today e.g. Parmelia saxatilis which Linnaeus called Lichen saxatilis. However, it was his last student, Erik Acharius (1757-1819), who made a detailed study of lichens, and the first on a world-scale when he divided the genus Lichen into c. 40 smaller genera, most of which are still in use today. From Linnaeus and Acharius, who is regarded as the founder of lichen taxonomy, lichens were studied by an unbroken stream of Uppsala botanists, viz. Elias Fries (1794-1878), Thor Magnus Fries (1832-1913), Rutger Sernander (1866-1944), Einar Du Rietz (1895-1967); Gunnar Degelius (1903-), and Rolf Santesson (1916-), with Santesson carrying on this distinguished tradition by being the teacher of many of the present generation of Swedish lichenologists, including Per Magnus Jorgensen, Roland Moberg, Leif Tibell, Anders Tehler, and Goran Thor.

Professor Santesson has travelled widely in search of lichens, throughout Scandinavia, Europe and Great Britain, and also most notably in South America where he botanised from 1939 to 1941, as well as more recently in the Middle East, East Africa, Sri Lanka, and Peru. His published work is very highly respected and encompasses a wide field of endeavour, the outstanding contributions of which are an encyclopaedic account of foliicolous lichens and the recent (1984) annotated catalogue of the lichens of Sweden and Norway.

Professor Santesson brings great credit to the British Lichen Society and we warmly welcome him to Honorary Membership.

D.J. GALLOWAY

The flora of copper lightning conductors

Churchyards may appear to be an overworked habitat, but one niche is generally overlooked. Most churches possess at least four metal lightning conductors. These broad strips of copper, regularly fastened to the building, descend from the highest points to the ground, often following the angle of a buttress. No lichens have been observed growing on the metal itself, but areas of stonework

which get flushed with copper-rich rainwater may support an unusual lichen flora. Normally the adjacent stone appears clean as if scrubbed - a sure sign of toxic washing. On St David's Cathedral, Pembrokeshire, however, the 'bare area' has been invaded by Acarospora smaragdula, present as its bright yellow-green copper morphotype. Away from the vicinity of the lightning conductor, the squamules are a brownish-grey colour but far less abundant. The colour change and copper tolerance of this species has been noted in recent copies of the Lichenologist, so this niche gives members all over Britain an opportunity to study lichen/copper interactions, for themselves. The Bulletin would be pleased to include further observations on the phenomenon. On a church in Oxfordshire, Psilolechia lucida appeared more abundant in the vicinity of a lightning conductor. Can anyone confirm this? On Chatsworth House, Derbyshire, the copper moss Pohlia proligera occurs where water which has flowed down the lightning conductor spreads out along a ledge, and nowhere else on the building.

Humpty Dumpty and the cracked areolate thallus

Do you now what 'rimose' means? Do you know how to say it? Does it rhyme with rime, as on a Physconia?

Duncan's opinion (1970, P.227) is that it means "with a rim". Stearn (1978, p.500) thinks otherwise. He reveals that 'rimosus' means "full of cracks, marked with numerous cracks", and Poelt (1969, p.48) elaborates to say that these fine to large cracks divide the thallus into irregular sharp-angled parts whose lateral walls are, at least initially, not clearly corticate. This may make a distinction from 'areolate' where (at least sensu Poelt) the angular divisions are generally corticate on their lateral faces as well as on top. This goes well beyond simple concepts restricted merely to superficial patterning.

We may now move on to 'effigurate'. Stearn (1978, p.420) translates 'effiguratus' as meaning "effigurate". This is a start. To this he adds "having a definite form or figure". A question arises: how

(Cont. page 26)

A TABULAR KEY TO YELLOW RHIZOCARPON SPECIES IDENTIFIED SO FAR IN THE BRITISH ISLES.

The yellow Rhizocarpon species are notorious for the problems they present in identification and published keys do not always agree in detail. In particular, ascospore sizes vary in magnitude, and the number of chemical tests given and the approaches to characteristic, anatomical and morphological description are variable.

The data presented here have been compiled from the sources given below. The ascospore sizes are an amalgamation of the ranges given by the authors. This may be unrealistic, but it is hoped that these parameters will be refined in future work. Indeed it is plain that much still remains to be done, both in checking and in extending the work.

An attempt has been made here to regularize the descriptions of the apothecia and areoles given by the authors; some of the detail has thus been lost. Runemark (1956) and Thomson (1967) give a much extended description of microscopic characteristics with additional chemical tests which could help in cases where identification is still uncertain.

Since the object of this key is to provide a rapid means for initial identification of species so far identified in Britain, it was felt that it would be more useful if the format was such that comparisons could be made across the whole range of species without the need to turn pages.

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VANESSA WINCHESTER

SUBSTRATUM	AREOLES Shape.								Colour, areolae Size mm.	APOTHECIA Shape & size in mm.								
Siliceous = Si. Calcareous = Calc. Parasitic = Para.	Angular	Round	Concave	Convex	Flat	Crescentic	Fissured		Green = g strong yellow = s.y light yellow = l.y whitish yellow = w/y yellow/green = y/g light y/g = l.y/g finely divided = f.d strongly divided = s.d prothallus = proth.	Angular	Round	Concave	Convex	Flat	Innate	Rimmed	Rimless	Fissured
± Siliceous. Hard rock.				±					y-w/y Scattered/close. ± verrucose & rough, margins ± crenullated. 0.3-1.5				-1.	Pruinose.		±		
± Calc., exposed alpine areas.									w/y-y/g Scattered/close. Smooth, ± pruinose. 0.4-1				0.5-1.1					
± Calc. rocks.				±					w/y-y Scattered/close. ± Farinose. Variable. ±1.5				0.4-1.2			±		
Si. ± Late snow, patches. Sloping, lower surfaces. Strong competitor.				±	±		V		w/y-s.y Scattered/close on proth. ± Massed at margin. Thick/thin, smooth/±undulant. 0.4-3				0.6-1.5		±		±	V
Para. on Lecidea & Aspicilia. Dusty, warm, sheltered.				±					y/g-g Smooth, matt. ± No proth. 0.3-1.2				0.4-1.			±		
± Si, Exposed rocks.									w/y-y Verrucose. s.d. Close/scattered. 0.4-1				0.5-1.			±		
± Si, Exposed rocks.									s.y-w/y Scattered/close. Smooth, ± glossy. 0.3-1				0.3-0.9					
Si. Damp, sunny, widespread.					±				g/y-s.y Elongated, matt, smooth. ± f.d. 0.3-1				0.3-0.9			±		
Exposed rocks.	±						V		s.y-g Smooth, glossy or matt. Thin, f.d. Close. 0.4-0.9				0.4-1.5					
Si. Dusty, damp, steep, sunny rocks.				±					s.y-y Grouped on strong black proth.							±		
Si. ± Dusty, wide ecological amplitude			±	±					g/y-y Not strongly subdivided. 0.4-1			±	±			±		
Si. Shade, often north facing.			±				V		y-y/g-w/g Strongly subdivided. 0.6-2.5			±	0.6-1.2					
Si. Exposed, also late snow patches.	±								s.y-g/y Thick, smooth ± matt. 0.4-2				0.5-1.5			±		
Si. including volcanics. Strong competitor.									w/y-s.y ± Elongated, smooth. ± Matt. 0.3-0.8				0.3-0.7			±		
± Si. Dusty, well lit, wet surfaces. ± Fe tollerant.		±							y-g/y rarely g/w ± Thick Scattered/close. ± Matt. 1-2 apothecia per areola 0.6-1.5	±			0.5-1.2		±			

A TABULAR KEY TO YELLOW RHIZOCARPON SPECIES IDENTIFIED SO FAR IN THE BRITISH ISLES

CHEMICAL REACTIONS	ASCOSPORES Septa numbers.	ASCOSPORE SIZES µm.	SPECIES (Distribution)
Yellow = y. Brown = b. Red = r. Red/yellow = r/y. Red/brown = r/b. Violet = v. Blue = b. Black = bl. Purple = p. Light = l. Strong = s. Epithecium = Epi.		Largest range selected from sources.	often, ⁴⁄₄ mostly = ³⁄₄ rarely = ¹⁄₄ more or less, partly = ±.
P⁺y/r, K⁺r. I⁻. Epi. dark.	1.	13-18 X 7.5-8.5	R. superficialis ssp. borealis (W. Arctic & Scotland)
P⁺y(⁻). K⁻. I⁻or b. Epi. K⁺y or r/v.	1.	21-30 X 10-12	R. inarense (Circumpolar & Scotland)
P⁺y(⁻). K⁺y/r(⁻). Epi. I⁺b. I⁺s.b.	1.	18-32 X 9-18	R. superiasoides (Circumpolar & Scotland)
P⁺s.y. K⁻. I⁻. Epi. K⁺r/br to r/v.	1.	18-35 X 9-16	R. alpicola (Montane) & Scotland)
P⁻ K⁻ I⁻ Epi. dark. K⁺r/v.	Few septa Muriform.	12-26 X 7-14	R. viridiatrus (Widespread, temperate areas)
P⁺y(⁻) K⁻ I⁺s.b. Epi. br. K⁺r/p.	"	22-30 X 10-16	R. geographicum ssp. arcticum (Arctic, alpine)
"	"	20-32 X 10-14	R. frigidum (Arctic & high mountains)
"	"	20-32 X 10-15	R. geographicum ssp. geographicum
"	"	22-32 X 10-14	ssp. prospectans (Maritime, & montane)
P⁺y. Epi. K⁻.	"	28-54 X 15-25	R. drepanodes (Alpine)
P⁺y(⁻). K⁻ I⁺s.b. Epi. K⁻.	Multiseptate Muriform.	24-40 X 11-15	R. geographicum ssp. lindsayanum (Widespread)
"	"	24-40 X 11-15	ssp. kittilense* (Europe, montane)
" Epi. K⁺r/v.	"	28-40 X 12-16	ssp. diabasicum (Widespread)
P⁺y(⁻) K⁺(⁻). I⁺s.b. Epi. br. K⁺r/p	"	25-40 X 12-22	ssp. linei (Mediterranean, & Europe)
P⁺r. K⁺y. I⁺s.b. Epi. K⁻.	"	27-45 X 11-19	R. lecanorinum (Temperate, widespread)

* Combinations proposed by Santesson, R.(1984) The lichens of Sweden and Norway. Stockholm & Uppsala: Swedish Museum of Natural History; but not validly published by him yet.

definite can a lichens's form (or vital statistics) be? Other authors such as Galloway (1985) have not been much worried by this - they tend to follow Stearn's usage (and also dictionary definitions, see e.g. Kirkpatrick, 1983) but Zimmer (1949) provided a lateral shift in meaning by translating 'effiguratus' as "figured, ornamental". Poelt (1969, p.31) produces an entirely different interpretation for 'effiguriert' - this he says, refers to thalli with elongated or at least clearly enlarged marginal lobes which are significantly different in form and size from the central lobes or areolae. This kind of organisation is summarised (though not referred to by name) by Jahns (1973, p.21), whilst Weber (1962, p.313) gives a fine contrast between the 'effuse' thallus which originates from an aggregation of individually-derived squamules, (each of which is potentially fertile), and the 'effigurate' thallus which starts as a single squamule, then grows to a rosette, which matures in the central area with the delimitation of fertile areolae. The effigurate thallus sensu Weber consequently has radiating sterile lobes at the outer edge, and is fertile only in the centre. This concept enlarges on that of Poelt, with the addition of localisation of reproductive potential.

Now, can juga be effigurate? Read on...
Is it being too pedantic to dwell upon these diverse meanings given to technical terms? I think not. Suppose you are trying to name Verrucaria spp with Fletcher's (1975) key, then you find that the thallus of V. internigrescens is "strongly rimose-areolate", whilst that of V. aethiobola is only "weakly rimose", and if using Taylor's (1974) key the juga of V. erichsenii and V. striatula are "effigurate" in contrast to those of V. ditmarsica which are presumably not. Well, can juga be effigurate?

An early task for the compilers of the new British Lichen Flora will be to standardise terminology.

KERY DALBY

(Ed. References available on application to the author).

For the well-travelled lichenologist

Francesca Greenoak recently photographed this unusual lichen community near the village of St Sauveur, about 20 km from Millau, Aveyron, France. Other cars of similar age were completely free from lichens, and there were few lichens on nearby rocks. The car had the best lichen growth in the area.

J.R.LAUNDON

Lichens return to central London

It is at least 150 years since foliose (leafy) epiphytic lichens were last observed on trees in central London, but this year (1986) they were seen to be well established on the Indian Bean tree (Catalpa bignonioides) in Chelsea Physic Garden. The trunk of this large leaning tree carries a spatter of at least two dozen small grey thalli of Hypogymnia physodes. Their size suggests that the largest, at 8mm diameter, may have been there since 1984. A careful search of the rest of the garden revealed one further, very small thallus on the Catalpa ovata.

A few other epiphytic lichens were present but none had the same sensitivity to SO_2 air pollution as H. physodes. The following is a complete list of lichens seen on trees in the garden on 6 March 1986.

Lecanora conizaeoides The most pollution resistant epiphyte in Britain. Greenish-grey thalli often in fruit, well established on at least a dozen trees, e.g. Magnolia, Populus, Catalpa, Koelreuteria, Diospyros.

Scoliciosporum chlorococcum. Scurfy dark thalli well established on the same trees as L. conizaeoides but mostly sterile.

Hypogymnia physodes Grey, leafy rosettes, see above.

Lepraria incana A powdery blue-grey crust. Abundant in several bark cracks between 1-2m, on the trunk of the Chinese Willow Pattern Tree (Koelreuteria paniculata). Also one thallus on the Date Plum (Diospyros lotus).

Lecanora dispersa Many small scattered pale fruiting colonies on the lower 1m 'knee' of the trunk of the Date Plum.

L.muralis Three thalli on the lower, soil contaminated 'knee' of the Date Plum together with the bryophytes Bryum argenteum and Ceratodon purpureus.

Phaeophyscia orbicularis One large patch on the 'knee' of the Date Plum.

Other specimens observed in the garden were the bark fungus Hysterium angustatum on the Chinese Honey Locust (Gleditsia sinensis)

and on Portland stone near the Embankment Road entrance there was a saxicolous lichen Lecania erysibe but this habitat was not investigated in any detail.

BSE cryptogam meeting at Aigas, 25-28 September 1985

In contrast to the previous year's meeting at Beinn Dearg, this was based in the luxurious surroundings of the Aigas Field Centre near Beauly, Inverness-shire. The main aim of the meeting was to investigate the cryptogams of the Glen Strathfarrer native pine forest, which was graded a site of international importance by the BLS Working Party. The lichenological contingent comprised Richard Brinklow, Emmanuel Serusiaux, Ray Woods and B J C, with William and Diana Purvis joining us for one day.

The first day began with a recce along the glen to the eastern end of Loch Monar, and our first stop was at the small gorge of Gob a 'Garbh-uisge' (28/217.311). We soon encountered, on a decorticate pine stump, fertile Hypocenomyce anthracophila, thus confirming its presence on the British list. It resembles H.scalaris in being sorediate, but is darker and more glossy, C-, PD + red, and its apothecia are pale brown - reminiscent of those of Cladonia caespiticia. Other noteable epiphytes included Cyphelium inquinans, Micarea hedlundii, Mycoblastus affinis and Trapeliopsis percrenata on pine lignum; Fuscidea arboricola ined. (PD + red soralia) on pine trunks; Arthonia aspersa, A. leucopellaea, Bactrospora corticola, Fuscidea cyathoides var. corticola, Lecidea vernalis, Parmelia discordans, Pertusaria ophthalmiza and Plastimatia norvegica on birch; and Bacidia biatorina, Lecanora farinaria and Ochrolechia pallescens on rowan. A crust with short lirellae in a rock underhang appears to be Encephalographa interjecta - if correct, then this name is not a synonym of E. (Poeltinula) cerebrina.

At Coille Garbh-leac (28/251.386) some aspens provided a change with eg Bacidia arceutina, Catinaria grossa, Collema furfuraceum, Lopadium disciforme, Parmeliella plumbea and Peltigera collina; and Arthopyrenia cerasi on young branches. A mossy rock face behind the aspens presented a puzzle: in addition to Nephroma laevigatum, N.parile and Psoroma hypnorum, there was a dark-coloured Peltigera with intermixed bright-green lobes of a member of the P.aphtosa group. Closer study proved that the latter was P. britannica (Gyelnik) Holt.-Hartw. & Tonsb., the former being

its bluegreen morphotype, recently discussed by Tonsberg and Holtan-Hartwig (Nordic J.Bot. 3: 681-688. The green morphotype of P.britannica can be distinguished from P.aphthosa by having loosely attached, often marginally extending, cephalodia. A quick scan through the P. aphthosa folders in E, suggests that most records of P.aphthosa (excluding P. leucophlebia) belong to P.britannica, which is a more oceanic species.

Further west, we stopped to examine rocks on the shore of Loch a'Mhuillidh (28/273.384) and were rewarded with Collema flaccidum, C. glebulentum, Placynthium flabellosum and Polychidium muscicola. Just above the shore, iron-rich boulders fallen from the cliffs behind revealed Acarospora sinopica, Huilia flavocaerulescens (sorediate), Lecanora epanora, Lecidea athroocarpa, L.atrofulva and Stereocaulon pileatum; also, and at an unusually low altitude (130m), Cornicularia normoerica, Pseudephebe pubescens and Sphaerophorus fragilis.

The following day's excursion began in mature pine-forest on the south side of River Farrar (28/32-3.39). Chaenotheca chrysocephala, Chrysothrix chrysophthalma, Hypocenomyce friesii, Lecidea cadubriae, L. hypopta, L.ochrococca and Parmeliopsis aleurites were among the characteristic pine-wood denizens, but most memorable were branches festooned with the pale grey wefts of Bryoria capillaris. The darker, small and shrubby B. furcellata was seen several times, especially on standing decorticate pine trunks. Additional on deciduous trees were: Arthonia aff. stellaris (epruinose) and Thelotrema subtile on hazel, Coniocybe sulphurea, on alder, Pertusaria coronata on birch, and Sticta sylvatica on rowan.

After crossing back over the river we explored the rock outcrops and scattered trees in the Charlie's Cave area (c. 28/330.397). Bryoria bicolor occurred on rock ledges, with abundant Lecanora altrosulphurea (resembling Lecidea sulphurea, but C + orange) on vertical faces below. Sheltered underhangs revealed Lecanactis umbrina and Psilolechia clavulifera. Several fallen decorticate pines were inhabited by Lecidea turgidula, several Micarea spp. and both species of Ptychographa. Old oaks by the road proved suitable for Lecidea epizanthoidiza, L. hypnorum s. lat. and Pertusaria hemisphaerica. Our day closed with a stop at the eastern most part of the glen, at Leishmore where roadside ash, elm, oak and sycamore bore many species of ± basic bark,

e.g. Bacidia beckhausii, Catillaria globulosa, Coniocybe pallida, Pannaria ignobilis, P. mediterranea and Wadeana minuta. Nearby, at Struy Bridge, a large patch of Leptogium saturninum was spotted from the car by R.K.B..

On Friday our venue changed to Glen Affric, most of the time being spent in the superb pine-wood of Pollan Buidhe (c. 28/19.22), especially noteworthy for the spectacle in stream valleys, of pines and birches clothed in Alectoria sarmentosa. Most of the characteristic pine-wood species encountered at Strathfarrar were seen here, and additionally present were Microcalicium ahlneri and M.subdisseminetum on pine lignum, and Cavernularia hultenii on birch. The walk back along the main track provided a good list of Cladonias, and in places gravelly soil was colonized by Stereocaulon condensatum and S. dactylophyllum.

Following the wining and dining in the splendid dining-hall of Aigas House, our evenings were spent sorting and identifying specimens, 'doing the cards' and being entertained with slide shows. Pine-wood fungi and lichens were the subjects of Roy Watling and B J C respectively; but most enlightening was an 'excursion' to see the lichens of the Namib desert with Emmanuel Serusiaux.

On Saturday after the other lichenologists departed, RKB investigated the lichens in the immediate vicinity of the Field Centre, including the adjoining conifer plantations. The list of 130 species while by no means complete, included none of the Caledonian Pine-forest species and emphasises the very restricted extent of these species and their communities.

Alan Bennell is to be congratulated for organizing yet another highly successful meeting, and Sir John Lister-Kaye and his staff are thanked for their hospitality. Thanks are also due to the various landowners for permission of access, and to Hugh Brown of NCC for much help and guidance.

BRIAN J COPPINS

Progress in the study of Wiltshire lichens

The south of the county has been fairly thoroughly covered, with 100 or more species recorded in most 10km squares. The centre and north are less well worked. More field records are needed before a satisfactory lichen flora can be published so any help that

BLS members can give in the coming months will be of great value.

The proposed layout will incorporate a new form of map (see figure). The dot matrix defines the 10 km squares, but in those squares where a species has been recorded we print the 10 km Eastings. Northings are printed in the column to the right. By this means we achieve a very readable 'map' and as the county extends less than 100 km from north to south no ambiguity is introduced by suppressing the 100 km codes. The data is stored on floppy discs feeding a Brother CE-70 typewriter. The discs are easily updated and a very high quality printout can be produced at any time.

. . .	9	Acrocordia gemmata
. . . . .	8	
8	7	On old trees with basic to weakly acid bark, especially
. . 9 . . 2 .	6	Sycamore, Ash and Elm, rarer on Oak; usually in well-
. . . . .	5	lit situations; locally common especially in S. Wilts.,
7 8 . 0 . .	4	in parks, old woods, and by roadsides; often with
. . 9 0 1 .	3	Xanthoria parietina.
. 9 0 1 2	2	
9 .	1	

. . .	9	Acrocordia salweyi
. . . . .	8	
. . . . .	7	On limestone walls, and on flat stonework in churchyards;
. 8	6	appears scarce, but has probably been overlooked
. . 0 . 2 .	5	in some areas.
. 8 . . 1 .	4	
. . . . 1 .	3	
. . . . .	2	
. .	1	

FRANCIS ROSE
EDWARD ELLIOTT

Secretary's report for 1985

The year started with a well attended A.G.M. and associated events. The previous evening a second successful Conversazione and Book Auction attracted 34 members and guests, the proceeds from which raised over £200. The theme of the lecture meeting was 'Travels with a Lichenologist' during which we were given tempting glimpses of lichen floras ranging from China to Saudi Arabia. At the meeting members were informed that Miss Ursula Duncan was unwell, and not long afterwards we received the sad news of her death on January 27th. The series of personal tributes in last summer's issue of the Bulletin reflect the extent of this loss to the Society.

During the year our newly appointed Assistant Treasurer, Mr.F.S.Dobson,

has spent innumerable hours chasing up members whose subscriptions were either in arrears or underpaid. This campaign, although reducing membership to 573 by the end of the year, has resulted in, we trust, a much more dedicated membership. Meanwhile 52 members were welcomed to the Society, a slight increase on the previous year. Council are grateful to Mr. Dobson for taking on this task in addition to other duties involving membership records.
Field meetings have been well attended, reflecting the success of the broadsheet circulated with the Bulletin. Dr C.J.B. Hitch was elected to the new office of Field Meetings Secretary, and is thanked for co-ordinating information and producing the broadsheet. Mr.F.H.Brightman, Mr.J.Carrington, Dr B.J.Coppins, Mr.V.J. Giavarini, Dr C.J.B. Hitch, Mr P.W. James, Mr J.R.Laundon and Dr F.Rose are all thanked for leading or arranging workshops and excursions.

Dr A.Fletcher will soon be leaving us for the U.S.A. Council are grateful for his five years' service as Conservation Officer during which he has co-ordinated two major site survey reports for the N.C.C. in addition to producing, at short notice, a report on Acid Rain for the House of Commons. We send him our good wishes for the future. Mr F.H. Brightman is thanked for representing the Society on the newly formed Conservation Association of Botanical Societies. We hope that their recently appointed Conservation Officer will be sympathetic towards lichens and liaison with the Society is anticipated.

Three parts of the Lichenologist and two numbers of the Bulletin were published during the year. Dr O.L.Gilbert and Prof.D.L. Hawksworth and his team are thanked for all their hard work as editors. Mr P.W.James is especially thanked as my co-author of the 'New Guide to Microchemical techniques' which was published as a supplement to the Bulletin. I would also like to thank Claire Dalby for producing the attractive greetings cards. The second of the series of conservation leaflets entitled 'Alternatives to Lichen Dyes' by Mr F.H. Brightman and Mr J.R.Laundon was also published and circulated to members. 1985 also saw the publication of the British Ascomycete checklist (by C.M.I.) which besides including nomenclatural changes that have occurred since the 1980 lichen checklist, includes considerable extra information. Preparatory work has also progressed on the second volume of the lichen atlas with the publication of a provisional first part by Dr M.R.D. Seaward which was sponsored by a computer company.

Perhaps the most exciting news of the year was received shortly before Christmas when the Society was informed that the application for a grant to finance the compilation of a new British Lichen Flora had been successful.
Prof.Moore, Prof.Hawksworth and Mr James are especially thanked for providing the necessary reports and submitting the application. We can now look forward to the final product at the end of the decade.

Finally I would like to thank all those in the Society who have supported me during my two years as Secretary, and in particular Mr Laundon. I look forward to continuing to serve the Society and feel sure that you will give my successor, Tim Moxham, your support and encouragement.

F. JOY WHITE

MISCELLANEOUS

Computerised mailing list

For some time the Bulletin mailing list has been computerised. Under the terms of the new Data Protection Act, members have to be informed of this and given a chance to object by writing to the Assistant Treasurer, Frank Dobson. Computerisation of this information is of inestimable benefit to the society as it allows rapid and efficient up-dating of members' addresses.

Provisional Atlas

About a dozen copies of volume 2, part 1 of the Provisional Atlas of the Lichens of the British Isles are available for sale to BLS members at £3.00, including postage and packing, from Dr M.R.D.Seaward, University of Bradford, Bradford, BD7 1DP.

Lichen Physiology and Cell Biology (ed.D.H.Brown) 1985

The above title has recently been published by Plenum press: ISBN 0-306-4200-X. Members can purchase it at the reduced price of £40 by sending remittance to: Madeline Carter, Plenum Publishing Co.Ltd., 88/90 Middlesex Street, London, E1 7EZ.

Request for material of Dermatocarpon

This is a request for fresh specimens of Dermatocarpon (including

Catapyrenium). One of my students, Mr.Harada, is studying the taxonomy of the genus for a doctoral thesis. The material is required to investigate more about the chemistry and ontogeny. Please sent to Prof.Zen Iwatsuki, Botanical Institute, Faculty of Science, Hiroshima University, Higashi-senda-machi, Hiroshima 730, Japan.

Course on Botanical Illustration 22-29 October 1986

Claire and Kery Dalby are running a course on Botanical Illustration at Nettlecombe Court, Somerset. It is intended for botanists who need to make illustrations, and for artists who would like to apply their skills to scientific illustration. Special emphasis will be laid on working for reproduction, particularly in black and white. Course members will be encouraged to work with both flowering plants and cryptogams. Further details from the Warden, Leonard Wills Field Centre, Nettlecombe Court, Williton, Taunton, Somerset, TA4 4HT.

New, rare or interesting British lichen records

Catillaria chloratiza V.C.8, South Wilts: on oak, Langley Wood, Hamptworth. A very rare British species, 1985. F.Rose.

Lemmopsis arnoldiana V.C.6, North Somerset; Brean Down, on a limestone fragment embedded in the turf, 1986. O.L.Gilbert

Leprocaulon microscopicum V.C.36, Kinver Edge, South West Corner of Staffordshire. On soil at the back of a roadside ditch beneath a sandstone bank, 1984. T.Duke

Lobaria pulmonaria V.C. 33, East Glos, Oakley Woods, Cirencester Park: on elm. First modern report from Glos.1985. K.Alexander

Parmelia centrifuga: New to Britain. Cairngorn Massif, Carn Aosda, 900 m, on north facing quartzite block with Rhizocarpon geographicum. 37/13-79-. 1985 C.J.B.Hitch

Parmelia soredians: Pembrokshire. On several gravestones on the sunnyside of St David's Cathedral. Third record from the Welsh mainland, 1986. O.L.Gibert

Placidiopsis custanii: North Somerset. Rare among broken limestone outcrops, Brean Down, 1986. B.J. Coppins. Locally abundant in limestone turf, Shute Shelve Hill, Nr Axbridge, 1986. Peggy Cayton. Note: much remains to be discovered in the Mendips.

Pseudevernia furfuracea: Norfolk. On a flat 20 years old roof covered with granite chippings, St.Olaves. The roof seems to be developing into a lichen heath as Coelocaulon aculeatum, Parmelia mougeotii and 10 Cladonias are also present. Peggy Cayton and C.J.B.Hitch

Porina sudetica New to Britain. V.C. 1, Cornwall. Near to mine shafts on rocky headland between Veor Cove and Porthglaze Cove, west of Zennor, St.Ives. This species is muscicolous and is close the P.mammillosa but differs in the spores which are 5-septate. On dry consolidated moss at shaft/cave entrance April,1986. Det.P.W.J. Vince Giavarini

Porocyphus rehmicus New to Britain. Ben Lawers. On vertical block of epidiorite near the summit. Thallus minute to 3 or 4 ical block of epidiorite near the summit. Thallus minute to 3 or 4 mm diam. Spores c. 14 x 10um. Prefers select company. Look for it between areoles of Lecanora frustulosa, Lopadium pezizoideum and Pannaria hookeri. Algae red-brown. August 1985. Det.P.W.James. Vince Giavarini

Thermutis velutina McGreggors Leap, Glen Lyon. A very distinctive though easily overlooked species. Look for it in association with Scytonema algae on boulders and wet rocks in the splash zone of fast flowing rivers especially in gorges and near waterfalls. August 1985. Det B.J.Coppins. First modern record. Vince Giavarini

Toninia fusispora New to Britain. Ben Alder Range, Coire Cheap. On crumbly sugar limestone. Superficially resembles T.aromatica but paraphyses not capitate and lax as in that species. Also recorded by O.L.Gilbert from Ben Lawers. Both 1985. Det B.J.Coppins Vince Giavarini

Umbilicaria hirsuta: Angus: on stone wall, Glen Isla, 1983. First record for Scotland, and for the U.K. outside Snowdonia. Numerous plants, including many small thalli, on a few stones only. This habitat is quite different from the more usual water seepage tracks on rock faces. Kery and Claire Dalby

New members

The following new members joined the Society between October 1985 and February 1986.

Assoc.Prof. Mrs M.Arianoutsou, Sector of Ecology, Div. of Biology, School of Sciences, University of Thessaloniki,540 06 THESSALONIKI, Greece.

Mr W. Brunnbauer, Naturhistoriches Museum, Botan, Abt., Burgring 7, A-1014 VIENNA, Austria

Mrs D. Downing, 44, Cleveland Road, MANCHESTER, M8 6QU.

Mr E. Edwards, Applegarth, KEMERTON, Glos., GL20 7JH.

Miss A.M. Fossa, Dalslandsgade 8, J804, 2300 COPENHAGEN 5, Denmark.

Mr L. Holmes, 11 Chesterfield Drive, RETFORD, Notts., DN22 6NP.

Mr M.Kuusinen, Kapytie 11 X, SF 00650 HELSINKI, Finland.

Dr J-H. H. Looney, Dept. of Botany, British Museum (Natural History) Cromwell Road, LONDON, SW7 5BD.

Mr R.W.Luxton, 7, Countess Walk, Stapleton, BRISTOL, BS16 1EU.

Ms D.Pinna, Centro di Restauro, Via D.M. Manni 67, 50135 FIRENZE, Italy.

Mr S. Pirintsos, Sector of Ecology, Div. of Biology, School of Sciences, University of Thessaloniki, 540 06 THESSALONIKI, Greece.

Mr G. Rambold, Wiesenstrasse 14, D-8300 ERGOLDING-WEST, West Germany.

Mrs V.E.Rampton, 106, Boxley Drive, West Bridgford, NOTTINGHAM,NG2 7GL.

Dr F. Rose,(Error in General Information Sheet)Phone Number should read 0730 893478.

Mr G.R.Smith, Oaktree Cottage, 3, New Street, Batcombe, DORCHESTER, Dorset, DT2 7BG.

Dr L.L. St.Claire, Dept. of Botany & Range Science, Brigham Young University, PROVO, Utah 84602, U.S.A.

Mr J.U. Tuck, 25 Sibthorne Road, Lee, LONDON, SE12 9DN.

Miss A. Zaharopulu, Sector of Ecology, Div. of Biology, School of Sciences, University of Thessaloniki, 540 06 THESSALONIKI, Greece.

Change of address

Please send any changes of address to the Membership Secretary, Mr Frank Dobson, 58 Parkway, London, SW20 9HF, who will ensure that the mailing lists are altered and that you will continue to receive all communications uninterrupted.

Lichenologist 18(1) was published on 12 February 1986 and 18(2) on 9 May 1986.

BARON, G. 1986. Hume herbarium lichen collections. South Lond. Bot. Inst. Gaz. 1: 1 - 2. [Account of lichen collections at the South London Botanical Institute (SLBI).]

BUBRICK, P. & GALUN, M. 1986. Spore to spore resynthesis of Xanthoria parietina. Lichenologist 18: 47 - 49.

CANNON, P. F., HAWKSWORTH, D. L. & SHERWOOD-PIKE, M. A. 1985. The British Ascomycotina. An Annotated Checklist. Commonwealth Agricultural Bureaux, Farnham Royal, Slough. [Checklist of British ascomycetes, including lichens, with habitat details.]

CULBERSON, C. F., CULBERSON, W. L. & JOHNSON, A. 1985. Does the symbiont alga determine chemotypes in lichens? Mycologia 77: 657 - 660. [Answer: no. Sporelings "from different chemotypes of the same morphology retain their integrity when lichenized with" algae from other lichens with different chemistries.]

ERIKSSON, O. & HAWKSWORTH, D. L. 1985. Outline of the ascomycetes - 1985. Systema Ascomycetum 4. University, Umeå. [235 families in 43 orders; 13 of Hafellner's 49 families are accepted.]

GILBERT, O. L. 1986. Field evidence for an acid rain effect on lichens. Envir. Poll. A, 40: 227 - 231. [Lichens with blue-green algae adversely affected by acid rain. The "increase in rainfall acidity is damaging rich areas of epiphytic lichen vegetation".]

GILBERT, O. L. & FOX, B. W. 1986. A comparative study of the lichens occurring on the geologically distinctive mountains of Ben Loyal, Ben Hope and Foinaven. Lichenologist 18: 79 - 93. [Descriptive account; the importance of rock mineralogy is emphasised. Lecanora chlorophaeodes Nyl. is new to Britain.]

HALE, M. E. & AHTI, T. 1986. An earlier name for Parmotrema perlatum "(Huds.) Choisy" (Ascomycotina: Parmeliaceae). Taxon 35: 133 - 134. [Parmotrema chinense (Osbeck) Hale & Ahti is a new name for the illegitimate Parmelia perlata Ach.]

HANKO, B., LEUCKERT, C. & AHTI, T. 1986. Beiträge zur Chemotaxonomie der Gattung Ochrolechia (Lichenes) in Europa. Nova Hedwigia 42: 165 - 199. [Chemistry of 16 species. Ochrolechia microstictoides Räsänen is maintained as a distict species.]

HAWKSWORTH, D. L. 1985. A redisposition of the species referred to the ascomycete genus Microthelia. Bull. Br. Mus. nat. Hist. (Bot.) 14: 43 - 181. [Extensive revision of all lichen-forming and non-lichenized species referred to Microthelia Körber. Monographs of Mycomicrothelia and Peridiothelia. New to Britain: Mycomicrothelia atlantica D. Hawksw. & Coppins and M. confusa D. Hawksw. Review of 144 excluded taxa.]

HENDERSON, A. 1985. Meanwood Valley survey. Part VII. Lichens. Leeds Naturalists' Club Scientific Assn. Newsletter 2: 27 - 42. [Detailed urban lichen study.]

INGRAM, G. A. 1984. Naturally-occurring agglutinins and lysins in woodland and maritime lichens of Wales. Nova Hedwigia 40: 263 - 272. ["It is probable that lichen agglutinins and lysins could serve as 'antibodies' ... to counteract substrate bacterial invasion and possibly give an overall protection against infection by other micro-organisms."]

INNES, J. L. 1985. Lichenometry. Progr. Phys. Geogr. 9: 187 - 254. [Review.]

KERSHAW, K. A. 1985. Physiological Ecology of Lichens. Cambridge University Press, Cambridge. [Review.]

LAUNDON, J. R. 1985. Desmococcus olivaceus - the name of the common subaerial green alga. Taxon 34: 671 - 672. [Desmococcus olivaceus (Pers. ex Ach.) Laundon is the correct name of the alga commonly called Pleurococcus viridis. "In early works it was regarded as a lichen."]

LAUNDON, J. R. 1986. Studies in the nomenclature of British lichens II. Lichenologist 18: 169 - 177. [The species called Buellia verruculosa should be B. ocellata (Flotow) Körber, whilst Rhizocarpon constrictum is a synonym of R. richardii (Lamy ex Nyl.) Zahlbr. and Rinodina fatiscens a synonym of R. aspersa (Borrer) Laundon. Aspicilia tuberculosa (Ach.) Laundon, Pycnothelia papillaria Dufour, and Rinodina atrocinerea (Hook.) Körber are also discussed.]

MAYRHOFER, H. & POELT, J. 1985. Die Flechtengattung Microglaena sensu Zahlbruckner in Europa. Herzogia 7: 13 - 79. [Microglaena s. lat. contains three genera: Chromatochlamys Trevisan, Protothelenella Räsänen, and Thelenella Nyl. Chromatochlamys larbalestieri (A. L. Sm.) Mayrhofer & Poelt, C. muscorum (Fr.) Mayrhofer & Poelt, C. muscorum var. octospora (Nyl.) Mayrhofer & Poelt, Protothelenella corrosa (Körber) Mayrhofer & Poelt, P. sphinctrinoidella (Nyl.) Mayrhofer & Poelt, P. sphinctrinoides (Nyl.) Mayrhofer & Poelt, and Thelenella modesta (Nyl.) Nyl. are reported from the British Isles.]

McCARTHY, P. M., MITCHELL, M. E. & SCHOUTEN, M. G. C. 1986. Lichens epiphytic on Calluna vulgaris (L.) Hull in Ireland. Nova Hedwigia 42: 91 - 98. [63 species.]

MOBERG, R. 1986. Lichen Exsiccatae and some other Collections in UPS. University, Uppsala. [List.]

SÉRUSIAUX, E. 1986. The nature and origin of campylidia in lichenized fungi. Lichenologist 18: 1 - 35. [Campylidia occur on foliicolous lichens and produce conidia which are dispersed together with algal cells.]

J. R. LAUNDON

A CHEMICAL CHECKLIST OF BRITISH LICHENS : Part 1

by F.Joy White and P.W.James

Introduction

As indicated in our recent updated 'Guide to Microchemical Techniques', published in Bulletin 57 (suppl.), December 1985, we envisaged the eventual compilation of a comprehensive chemical checklist to the British lichen flora. Already much work has been compiled on this aspect in conjunction with the new flora project. However, it is felt, since this information is already available, that it should be accessible in the interim period to B.L.S. members via the Bulletin, at least for major macrolichen genera.

Data presented for each species are based on personal observations from TLC assays, and often records characteristic additional accessory substances, some of which still remain to be identified. Full chromatographic characteristics of all substances are given. Occasionally information given may correct previous reports in the literature which required further verification. Additional notes are provided as an aid to identification.

During the preparation of this first part an additional solvent system was used which, originally designed to separate perlatolic and stenosporic acids, was also found to improve the separation of many substances of high Rf class as well as being more stable. The components of this solvent system, indicated as "HEF", are given in the legend.

LEGEND

underlining indicates predominating substances
± before substance = sometimes present, sometimes absent
? before substance confers some doubt on the identity of that substance
+ to +++ after substance indicates quantity of substance (arbitrary by visual definition only)
(+) or (++) variability of amount from specimen to specimen
tr-+ trace to small quantity of substance
uv+ a positive UF fluorescence before charring
uvc+ a positive UV fluorescence after charring

(glass) after substance indicates a fatty acid only revealed by running of coated glass plates

a = acid

y-r (crystals) A special result of the K test with norstictic acid in which numerous blood-red, needle-shaped crystals are formed as seen in microscope preparations

or = orange, r = red, y = yellow

tr = trace of substance

C, K, PD etc. = standard reagents

"HEF" hexane : ethylacetate : formic acid; 139:83:8 ml

EA = solvent system EA (see White & James, 1985)

PARMELIA

acetabulum	norstictic a ++(+), connorstictic a +(+). No atranorin detected. Medulla K+ y-r (crystals), PD+ or.
afrorevoluta	atranorin ++, ±? lecanoric a tr, gyrophoric a +++. A compound corresponding to lecanoric acid is revealed by EA in small quantity in most specimens. See also P.britannica and P.revoluta. Medulla C+ or with red tinge.
arnoldii	atranorin ++(+), α-collatolic a ++(+), alectoronic a +++. ±UV+(+) ice-blue accessory compounds (up to 4) are sometimes also present. Medulla UV+++ ice-blue, KC+ pink.
borreri	atranorin ++(+), gyrophoric a +++. No lecanoric acid or other related depsidones revealed by EA. Medulla C+ or with red tinge.
britannica	atranorin +++, ±? lecanoric a tr, gyrophoric a +++. See under P.afrorevoluta. Medulla C+ or with red tinge.
caperata	usnic a ++(+). caperatic a ++(glass), protocetraric a ++. See P.soredians. Medulla PD+ rust-r.

centrifuga

atranorin ++, usnic a ++, +∝C-collatolic a tr, alectoronic a +++. The partial juxtaposition of atranorin and usnic acid on the tlc plates produces a bright purple spot at the interface. Medulla UV+++ ice-blue, KC+ pink. This specie has only recently been recorded from Britain.

conspersa

usnic a ++(+), hypostictic a tr, norstictic a +(+), sticta a +++, Cryptostictic a +, ± unknown (PCr4) tr, unknown UV+ (+) ice-blue +, ± unknown (PCr1) tr, ± connorstictic a tr, constictic a +++, ± unknown (PCr2) tr, unknown (PCr3)+. Norstictic acid is usually present in conspicuous amount; hypostictic acid is best seen as a UVC+ cherry-red spot. Salazinic acid containing specimens (rare) are referable to P.tinctina (cf.) Medulla K+ or-r (crystals), PD+ or.

crinita

atranorin ++, hypostictic a tr, norstictica tr, stictic a +++, mengazziaic a +, cryptostictic a+, ± unknown (PCr4) tr, unknown UV+ ice-blue +, ±unknown (PCr1) tr, constictic a +++, +unknown (PCr2) +, unknown (PCr3) +, Medulla K+or.
See White & James 1985 Fig 3 p.36.

delisei

+perlatolic a tr-+, glomelliferic a +++, glomellic a +++, gyrophoric a tr.
Both glomelliferic and glomellic acids are UVC +++ pale bluish after charring; the upper UVC spot, glomelliferic acid, soon fades to UVC+ slate-blue, but the lower spot, glomellic acid retains its UV +++ fluorescence for several days.

discordans

+atranorin tr-+, lobaric a. ++(+), protocetraric a ++(+). Medulla PD+ rust-r. Protolichesterinic acid was not detected.
cf. P.omphalodes. Medulla PD+ rust-r.

disjuncta	perlatolic a ++(+), stenosporic a +++, ±gyrophoric a tr-+(+). The faint KC+ pink reaction sometimes obtained may be due to very small amounts of gyrophoric acid.
elegantula	No lichen substances detected.
endochlora	atranorin+(++), barbatic a ++(+), 4-o-demethylbarbatic a +, norobtusatic a +++, entothein (yellow pigment)+++, ±echinosporic a tr-+(+), ± unknown accessory to echinocarpic a tr. Best separation achieved in "HEF" or G or a two-way assay of these solvents. No obtusatic acid was detected, cf. P.laevigata. Medulla KC+ pink. The medulla is pale primrose-yellow.
exasperata	No lichen substances detected.
exasperatula	No lichen substances detected.
glabratula, inc. subsp.fuliginosa	lecanoric a +++, ± rhodophyscin (orange pigment, K+ violet) +(+). Medulla C+red, cf. P.subaurifera.
horrescens	atranorin++(+), lecanoric a ++, gyrophoric a +++, up to 8 UVC+ green-black depsidones tr-+++. Medulla C+red.
incurva	usnic a ++(+), ± ∝collatolic a tr, unknown UV+(+) ice-blue accessory substance tr-+, alectoronic a +++, ±protocetraric a + (++). Medulla KC+ pink, PD- or rust-r. Protocetraric acid only occurs in some specimens.Cf.P.centrifuga
laciniatula	No lichen substances detected.
laevigata	atranorin ++(+), barbatic a +++, obtusatic a ++, 4-o-demethyl-barbatic a+, norobtusatic a +, ± unknown UV+ blue compound +. Best separation is achieved in "HEF" or G or a two way assay of these solvents. Medulla KC+ pink-or.

loxodes	±perlatolic a tr-+, glomelliferic a +++, glomellic a ++, ± gyrophoric a tr-+. Medulla KC± pink. Cf. P.delisei: this species and P.loxodes are only separated by the presence of scattered glomerule-clusters of isidia (cauliflower-like) in the latter.
minarum	atranorin ++(+), ±? lecanoric a tr, gyrophoric a +++, No other related depsidones were detected in EA, cf. P.horrescens. Medulla C+ red with an or tinge.
mougeotii	usnic a++(+), hypostictic a tr, norstictic a tr-+, stictic a +++, cryptostictic a +, ±unknown (PCr4) tr, unknown UV+ ice-blue +, ±unknown (PCr1) tr, constictic a ++(+), ±unknown (PCr2) tr, unknown (PCr3) tr. Medulla K+ or, PD+ or.
omphalodes	±atranorin tr-+, lobaric a +++; ±unknown, faint yellow spot revealed only after charring +, salazinic a ++(+), consalazinic a+ Medulla K+ or, PD+ or. Cf P.discordans.
pastillifera	atranorin ++(+), lecanoric a +++ No gyrophoric acid or other accessory depsidones observed. Medulla C + carmine - r.
perlata	atranorin ++(+), hypostictic a tr-+, norstictic a tr-+, stictic a +++,menegazziaic a +, cryptostictic a +, ±unknown (PCr4) tr, unknown UV+ pale blue +, unknown (PCr1) tr-+, constictic a ++(+), unknown (PCr2) +, unknown (PCr3) +. Medulla K+ y-or, PD+ or.
pulla	± stenosporic + (++),± divaricatic + (++), ± gyrophoric a tr-+ Both major substances are usually present together; specimens in which stenosporic acid

predominates outnumber those in which divaricatic acid predominates by 10:1. Gyrophoric acid accounts for the occasional C+ pink reaction in c. 25% of specimens.

quercina — atranorin ++(+), lecanoric a +++.
No gyrophoric acid or other accessory depsidones detected with EA.
Medulla C+ carmine - r.

reddenda — atranorin ++(+), up to 5 unknown fatty acids (glass), rf range TDA 3-5, "HEF" 3-4, G 2-4.
Medulla C-, cf. P.borreri and P.subrudecta.

reticulata — atranorin + (++), salazinic a +++, consalazinic a +
Medulla K+ or, PD+ or.

revoluta — atranorin ++(+), +? lecanoric a tr-+, gyrophoric a +++ Cf P.afrorevoluta,
Medulla C+r with an or tinge.

robusta — atranorin ++ (+), +usnic a tr, protocetraric a ++(+). Medulla PD+ rust-r. Cf. P.perlata.

saxatilis — atranorin +(++), + norstictic a tr, +lobaric a +, + unknown. UV+ pale, UVC pale pink-or tr-+, salazinic a +++,consalazinic a +(+).
No fatty acids detected. Medulla K+ or, PD+ or.

septentrionalis — fumarprotocetraric a ++, +unknown (Cph1) tr-+. Medulla PD + rust-r.

sinuosa — usnic a + (++), norstictic a tr-+, stictic a tr, cryptostictic a tr, salazinic a ++, constictic a +++, consalazinic a +.
Medulla K+ or, PD+ or; note the unusual combination of salazinic acid and constictic acid which appears to be standard in British material.

soredians	usnic a ++(+), norstictic a +++, connorstictic a. + Medulla K + red (crystals), PD+ or. Cf. P.caperata.
stygia	i)fumarprotocetraric a ++, protocetraric a tr ii) no lichen substances detected In British material race ii predominates; no fatty acids were detected. The medulla in race i is PD + rust-r.
subargentifera	lecanoric a+++. No additional related substances revealed with EA. Medulla C+ carmine -r. Cf. P.subaurifera.
subaurifera	subauriferin (yellow pigment, K-, in soralia),+(+), lecanoric a +++. No additional related substances revealed with EA. Medulla C+ carmine -r.Cf P.glabratula.
subrudecta	atranorin + (++), lecanoric a +++. No additional related substances revealed with EA. Medulla C+ carmine -r. Cf P.borreri.
sulcata	atranorin ++(+), unidentified pigments, UV + dull r to or +(++), ± unidentified UV+ pale, UVC pale pink-or tr- +, salazinic a +++, consalazinic a + (+). No fatty acids detected. Medulla K+y -or, Pd+y -or.
taylorensis	atranorin ++(+), lecanoric a +++, evernic a + (++). Medulla C+ carmine-r.
tiliacea	atranorin ++(+), lecanoric a +++ No additional substances revealed with EA. Medulla C+ carmine-r.

tinctina

usnic a ++ (+), norstictic a + (+), unidentified UV+ pale blue (in G rf 3), salazinic a ++(+), consalazinic a+.
Cf. P.conspersa.

verruculifera

divaricatic a ++ (+), ± unknown (TE1 of Esslinger, 1977) tr, ± gyrophoric a tr-+.
No British material contained stenosporic a and gyrophoric a is rarely present (5%).
Medulla rarely KC ± pink.

ALLANTOPARMELIA

alpicola

alectorialic a ++(+), unknown accessory substances (upto 4) tr-+(+), barbatolic a +(++), unknown fatty acids (up to 4, one major, the rest ±) (glass) + (++).
The rf values for the main fatty acid are TDA 3, 'HEF' 2-3, G 2-3. The unknown accessory substances occur as flesh-coloured to rose-pink spots and are related to alectorialic a.
Medulla C+ carmine-r, P+ y-or.

MENEGAZZIA

terebrata

atranorin + (++), norstictic a tr-+, stictic a +++, mengazziaic a + (+), cryptostictic a +, unknown (PCr4) tr-+, unknown UV+ice-blue+, unknown (PCr1) tr, constictic a +++, ± unknown (PCr2) tr-+, unknown (PCr3)+.
Medulla K+ y-or, PD+ y-or. The slate-grey spot signifying mengazziaic a is usually distinctive.

APPENDIX

Additions and corrections to: F.J.White & P.W.James, a new guide to microchemical techniques for the identification of lichen substances, Bull. Brit.Lichen Soc. 57 (suppl.): 1-14 (1985)

Table 4 Identification of common lichen products by TLC.

1. The heading to the fourth column under "Rf Class" should be "G" not "D" as this refers to the code for the solvent system used (Sheets 1-6).

2. For "unknown PCr 2" (sheet 1) "Notes" should read as follows: "with stictic a., best in G or 2-way."

3. For hypoprotocetraric acid (sheet 3) UV fluorescence before charring should read "+ blue".

4. For picrolichenic acid (sheet 3) Rf class in solvent G should read "3-4".

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