

# BRITISH LICHEN SOCIETY

## BULLETIN

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President: O. L. Gilbert, Ph.D.

### Dyers threaten lichen flora

Nobody knows when weaving was invented, but among the pieces of prehistoric cloth that have been preserved in bogs or by the heat of the deserts are some in which the natural variation of colour of wool has been exploited to make patterns. The cave paintings of Lascaux show that man has long appreciated the use of colour, and, when it was discovered that dyestuffs from plants and animals could be used to decorate cloth, the secrets of how to use these dyes were carefully guarded. The Phoenicians, amongst others, made and traded cloth dyed with Tyrian Purple, obtained in very small amounts by crushing large numbers of sea snails (Murex brandaris) collected from Mediterranean shores. Roccella tinctoria was also collected, from the rocky shores of Crete, but the lichen purple that could be prepared from it was unstable, and faded to brown after several years. However, cloth dyed with lichen purple and then Tyrian Purple was more richly coloured than if either were used alone. Because of the great effort expended in collecting enough Murex or Roccella, such cloth was very expensive, and only magistrates and the children of wealthy families could afford to wear the status symbol of the purple-bordered toga praetexta. As the Roman Empire declined, the edges of such togas were dyed with lichen purple alone, in an attempt to maintain standards despite rising costs.

Until 1856, when W. H. Perkin discovered how to make a mauve dye from coal tar, all dyes were obtained from natural sources. The 18th century cudbear industry of Scotland produced as much dye as possible from the species of Cehrolechia and Parmelia growing locally, but when demand outstripped the available supply of lichens they were imported from Scandinavia. Perkin's discovery, and synthetic dyes that were copies of natural ones, relieved the lichens of Scotland from the onslaught of dyers because the synthetic dyestuffs could be made in virtually unlimited amounts. Many new dyes were produced industrially that were of very similar chemical structure to their natural counterparts.

When Julius Caesar came to Britain he found that the inhabitants knew how to ferment the leaves of Isatis tinctoria to produce woad (containing indigo), with which they dyed themselves blue. The Tyrian Purple on his toga was 6,6'-dibromoindigo, although he could not have known of the close chemical similarity between the dyestuffs on his clothing and on the 'barbarians' attacking him from the forests. Only Perkin's successors could appreciate the similarity, though their attempts to synthesize Tyrian Purple industrially were unsuccessful. In 1907 Engi discovered how to synthesize 5,5'-dibromoindigo (Midland Vat Blue R), a similar compound that is a better dye than Tyrian Purple.

The technique of thin-layer chromatography (see Bulletin 34: 3 (1974)) that is so useful to the lichen taxonomist also shows which species contain substantial amounts of the chemical compounds (e.g. lecanoric, gyrophoric and fumarprotocetraric acids) that are 'active' in lichen dyeing. However, the 'inactive' compounds also present and the fungal hyphae of any thallus

so modify the effect of the 'active' ones that intact lichens produce richer colours than any obtained using pure lichen acids. There are so many synthetic red, brown and purple dyes that it is unlikely that it will be commercially desirable to make a family of dyestuffs based on lecanoric acid, even though in 1973 several Japanese microbiologists patented a method for obtaining lecanoric acid, using a selected strain of Piricularia (see Chemical Abstracts 80: 2315g (1974) & 81: 165443g (1974)). This fungus normally causes leaf-spot disease on the Sino-Japanese grass Muhlenbergia japonica, and the fact that something other than a lichen mycobiont can make a 'lichen substance' might surprise some lichenologists, even if it pleases industrial chemists.

Contemporary Britain, with its high population density and its industrialisation, has engendered an interest in natural dyes and fibres among many people. Some of these might eschew a packet of Midland Vat Blue R because it is 'not natural', and lichen dyeing appeals to them because the materials are safe to use and no mordants are needed. There are probably many kitchens in which woad or cudbear is fermenting alongside the home-made wine and the leavening dough, though few of these will be the kitchens of competent lichenologists.

There must be many lichenologists who would ruefully admit to having accidentally collected rare species that should have been left in situ, such as by collecting an interesting patch in the middle of a Peltigera that is almost out of reach and then finding (too late) that it's a Sticta. A lichenologist can often detect that another has previously passed through a wood because of the small pieces of bark carefully removed from trees. By contrast, the ravages inflicted by a novice dyer, who has discovered just how many dry lichens constitute a weight equal to that of the wool to be dyed, and who has yet to learn that not all foliose species are effectual, are obvious to all. Experienced dyers, who appreciate the need to collect only the species that are of use to them and know of the very slow regeneration rate of the lichen flora, may have read of a method of producing black wool that involves dyeing with indigo and then boiling the cloth with water and Lobaria pulmonaria. Apart from air pollution and the changes of forestry practice, it may be that over-collection by pharmacists and dyers of previous centuries has deprived most Britains of the opportunity of finding sufficient Lobaria to try this recipe.

Members of the British Lichen Society have been active campaigners against avoidable increases in air pollution and the unnecessary clearance of old woodlands. Perhaps they should promote research into 'kitchen-table' methods of growing Piricularia, so that the demand for natural dyes by the dyeing dilettanti could be satisfied without eradicating elements of the British lichen flora. Of course, should air pollution so increase that Lecanora conizaeoides became pandemic, lichenologists and dyers would find their field of study severely restricted, though there is a crumb of comfort for the latter: L. conizaeoides contains fumarprotocetraric acid.

B. J. STARKEY

### Meetings 1978

Provisional arrangements for the Society's meetings in 1978 include the annual general, lecture and exhibition meeting on 7 January at the British Museum (Natural History), London, the spring field meeting in Tenerife (Canary Islands), the summer field meeting in Brecon (Powys) and Worcester, and the autumn field meeting at Whitby (North Yorkshire). In addition day excursions to Kent and the New Forest (Hampshire) are planned.

### Autumn field meeting at Kettering 1977

The autumn field meeting will be held in Northamptonshire from Friday evening 21 October until Sunday afternoon 23 October 1977 under the leadership of Mr J. R. Laundon. Northamptonshire has been lichenologically neglected in recent years, but still retains many varied habitats, and it is expected that a representative sample of these will be visited during the weekend. The localities to be studied are in the most beautiful parts of the county (Fawsley Park, Rockingham Forest, Welland Valley) so the meeting will be of scenic as well as lichenological interest. During the weekend special emphasis will be given to the demonstration of common lichens for the benefit of beginners. The Kettering & District Natural History Society will also take part in the excursion, and they have very kindly placed their meeting rooms at our disposal. These are fully equipped with microscopes, library, tables, etc., as well as having kitchen equipment for refreshments. The George Hotel will be the headquarters hotel and members should book their own accommodation then complete the form at the end of this Bulletin and return it to Mr Laundon; anyone having difficulties with booking should contact Mr Laundon (telephone: 01-589 6323 ext. 552). Kettering is easily accessible by public transport, it being on the St Pancras to Leicester railway, and accommodation at modest cost is available. The programme will be as follows:

Friday 21 October. 19.30. Meet outside George Hotel, Sheep Street, for short journey to clubrooms of Kettering & District Natural History Society at 183A Rockingham Road, Kettering, for lecture.

20.00. Lecture; G. F. PETERKEN (Nature Conservancy Council, Huntingdon): WOODLAND HISTORY IN ROCKINGHAM FOREST. Illustrated with slides and maps.

Saturday 22 October. 9.30. Field excursion to Daventry area. Meet outside George Hotel, Sheep Street. Bring packed lunch. Places to be visited include Old (lichens on ironstone walls), Fawsley Park (corticolous lichens in ancient picturesque parkland) and Clipston (roadside trees). Specimens will be studied in the clubrooms in the evening.

Sunday 23 October. 10.00. Field excursion to Rockingham Forest and Welland Valley. Meet outside George Hotel. Bring packed lunch. Places to be visited include Old King's Wood (corticolous lichens of Rockingham Forest - now much depleted by pollution from Corby), Cottingham (limestone walls) and Pipewell (old ironstone workings). Disperse in late afternoon.

Accommodation at Kettering is as follows, all being in the proximity of the town centre:

George Hotel, Sheep Street (headquarters) (telephone: Kettering 2705), 36 single, 15 double. Bed & breakfast £7.99 single, £10.75 double (including VAT). Evening meals £2.93 + VAT. AA two-star.

Angel Hotel, Carrington Street (telephone: 2582). Double rooms only - members may need to share. Bed & breakfast £3.25; bed, breakfast & evening meal £3.75 (including VAT).

Talbot Hotel, Meadow Road (telephone: 4565). 1 single, some double. Bed & breakfast £3.75 (including VAT).

Strathmore Guest House, 97 Broadway (telephone: 3072). 2 single, some double. Bed & breakfast £3.50 single, £6.50 double (including VAT).

Jones, M., 29 Green Lane (telephone: 4322). 2 single, 2 double (all with hot & cold water). Bed & breakfast £3; bed, breakfast & evening meal £4.

### Spring field meeting in Tenerife 1978

The spring field meeting will be held in Tenerife, Canary Islands, in April 1978, probably from 2 - 9, under the leadership of Mr P. W. James, with Mr C. L. Champion as local Secretary. Members may be able to stay on for a second week on an informal basis. It is hoped to arrange for members to go as a "package" and therefore those interested must return the form at the end of this Bulletin to the Secretary in order to receive full details as soon as they are available. Bookings may be necessary before the issue of the next Bulletin.

### Course on lichens as pollution monitors

A course of six evening meetings on "Lichens as pollution monitors" is being given by Dr D. L. Hawksworth for the Workers' Educational Association at Danesfield Adult Education Centre, Grange Road, Woking, Surrey, starting on Tuesday 26 April 1977 at 19.30. Most aspects will be discussed and no previous knowledge is assumed. For further details contact the WEA Woking Branch Secretary, Mr R. A. Ludlow, 49 Orchard Drive, Woking, Surrey GU21 4BW (telephone: Woking 4366).

D. L. HAWKSWORTH

### Local collections conference at Liverpool

The Biological Curator's Group, Geological Curator's Group and Systematics Association are holding a conference entitled "the function of local natural history collections" at the University of Liverpool Halls of Residence 22-23 September 1977. The meeting will assess the relevance of the wealth of botanical, zoological and palaeontological material held by varied provincial institutions. It is hoped to stimulate co-operation nationally. Speakers will include those involved professionally in organising collections and a wide variety of users. Details, programme and registration form are available from Mr E. F. Greenwood, Assistant Director (Academic), Merseyside County Museums, William Brown Street, Liverpool L3 8EN.

E. F. GREENWOOD

### World Wildlife Fund

In 1976 lichen work supported by money from the World Wildlife Fund was undertaken in Cornwall, Devon, Ireland, Isle of Man and north-west Yorkshire. The balance remaining is £245 and applications for support in 1977 should be made to Dr O. L. Gilbert, Department of Landscape Architecture, The University, Sheffield S10 2TN. Any survey, mapping or autecological work will be considered but to ensure that the maximum number of people benefit, grants will normally not be for more than £40 so members should not expect the full cost of any project to be covered.

O. L. GILBERT

### Subscription increase next year

The Annual General Meeting on 8 January 1977 decided that the subscription for ordinary members should be £7, with a sum of \$15.00 for those who pay in U.S. dollars, from 1 January 1978. The subscriptions for junior associate at £1 and family membership at £0.25 remain unchanged. Will those members who pay by bankers' order kindly complete the form at the end of this Bulletin and send it to their bank.

Subscriptions should be sent to the Assistant Treasurer, Mr P. W. Lambley, British Lichen Society, c/o Castle Museum, Norwich NR1 3JU, United Kingdom, except for members living in North America, who should send theirs to the Regional Treasurer (North America), Dr J. W. Sheard, Department of Biology, University of Saskatchewan, Saskatoon, Saskatchewan S7N 0W0, Canada. The 1977 subscription is £5 per year for ordinary members, £1 for junior associate members and £0.25 for family members. Reading circle subscriptions are £1 per year. The dollar rate is \$12.50 for ordinary membership. Please note that acknowledgments are not sent unless requested because of postage costs.

### Lichenologist published

Part 2 of volume 8 of The Lichenologist was published on 13 November 1976. Any paid-up ordinary member for 1976 who did not receive a copy should inform the Assistant Treasurer, Mr P. W. Lambley, British Lichen Society, c/o Castle Museum, Norwich, NR1 3JU.

## Lichen photography

Most lichenologists, at some time, find the need to photograph specimens to send to illustrate papers, record rare species, or communities, etc. The purpose of these notes is to help to obtain the standard of reproduction required if the photographs are to have much scientific value.

Photographs of communities and large habitats may be obtained with almost any camera, but due to the small size of many lichens, a camera capable of producing an image of at least 2 lifesize is really essential to photograph individual specimens.

It could be said that the best results can be obtained with large format cameras (e.g. 5" x 4"). These cameras offer a wide range of movements which, with some difficult specimens, offer the only way to obtain sufficient depth of field. The high price of each sheet of film also exerts a discipline to make sure that the details are as required before you release the shutter. The large image obtained helps to reduce the problems of grain size on enlargement. Unfortunately these cameras are expensive and their large size and weight make them impractical to use in the field.

The smaller 6cm x 6cm single lens reflex cameras produce excellent results but again are very expensive. Twin lens reflex cameras such as the Rollei are used by many people and with close-up lenses enable a reasonable sized image to be obtained. When these or any other camera which does not have a "through the lens" viewing system, are used at close range the problem is parallax, in that the image seen through the viewfinder differs from that reproduced on the film. This may be overcome by fixing a simple wire frame projecting from the front of the camera to give the limits of the image on the film. Supplementary (close-up) lenses give reasonable results but in many cases the slight lack of sharpness of the image reduces the value of the photographs. The "power" of a supplementary lens is measured in dioptries (the reciprocal of the focal length of the lens measured in metres.) These values are additive so that a 3 dioptry plus a 2 dioptry lens has a power of 5 dioptries. The following tables give the results obtained with various lenses:

Lens	Focal length	Distance focused on lens setting	Object area at 90cm	Object area at 90cm
1 dioptry	100 cm	100 cm	47.6cm	72 x 148 cm
2 dioptry	50 cm	50 cm	32.4cm	36 x 24 cm
3 dioptry	33.3 cm	33.3 cm	24.3cm	24 x 16 cm
4 dioptry	25 cm	25 cm	19.6cm	19 x 12 cm
5 dioptry	20 cm	20 cm	16.4cm	14 x 10 cm

The most versatile camera for lichen photography is probably the 35mm single lens reflex camera. It is compact and usually has interchangeable lenses, these greatly extending the range of subjects for which it can be used. It is also possible to see exactly the area and depth of field that will appear in the photograph. There is a wide range of cameras of this type and second-hand ones can be obtained at a very reasonable price. The cost of film is also low enough for it to be possible to take several different photographs of the same subject without undue expense.

Due to the mirrors and prisms in the viewing system, the image is viewed the normal way round and in most cameras at eye level. Some makes of camera have either an additional or integral waist level viewfinder and this can be very useful when photographing a lichen close to the ground.

As it is possible to fit various lenses to these cameras they are usually fitted with a focal plane shutter to prevent the film from being fogged. On some cameras it will be found that the action of the mirror and shutter is rather violent and on the long time exposures that are often required, it is difficult to prevent camera movement.

As the lens will not normally focus at the short distances required for much lichen photography, this is overcome by the use of extension tubes or bellows. Extension tubes usually come in sets and this enables the correct permutation of length to be chosen to give the required size of image. Flare from light reflected from the side of the tube can be a problem as it degrades the quality of the photograph.

The problem can be prevented by using a deep lenshood; this may be made from a tube of black paper.

A standard lens is not designed for use at short range and it may prove impossible to get the whole image sharp. The quality obtained may be improved by using a reversing ring which enables you to fit the lens "back to front". It will then be closer to the design specification. If much macrophotography is to be done the only real answer is to purchase a macrolens. The result is not only very much better, but the range of focus of the lens enables much photography to be done without the need for extension tubes. They also make excellent enlarger lenses.

For work in the laboratory the less sturdy bellows are often better than extension tubes. They have an infinite range between their maximum and minimum and are much faster to alter than tubes when a magnification change is required. The shape of the bellows also almost eliminates flare. However the minimum extension is fairly long and the gap in image size between this and the size obtained with the lens directly in the camera may give problems. If an auto iris is fitted in the camera it will not work with the bellows unless a double cable release is used.

It will be found that with any method, that focusing is difficult when photographing at about life size. At this point it will be found easier to focus by moving the whole lens and camera in relation to the subject.

The focal length of the lens is important as if a lens of less than 50mm is used it may be found that at large magnification the lens is so close to the subject that it is almost impossible to illuminate the specimen. It should be noted that, at a given magnification, the depth of field will be the same regardless of the focal length of the lens. However the distance from film to subject will vary. In most cases maximum depth of field is required and this is obtained by stopping down to at least f22. It is probable that the definition of the lens drops off if it is stopped down past about f16. This is normally less important than the extra depth of field obtained. An exception is in the case where a simple supplementary lens is used. Here the loss of definition may be more than can be tolerated. There is also a shift in the point of focus in some lenses if they are stopped down and this must be allowed for from experience.

In the field natural daylight may often be used for illumination but for close-up work this means long exposures. This in turn brings the problem of reciprocity failure where outside the normal exposure range (about  $\frac{1}{8}$  second to  $\frac{1}{1000}$  second) the speed of the film is not constant. This may be overcome in monochrome with experience of the film concerned. In colour photography the sensitive layers of the film may react differently and cause a colour cast in the finished result.

Many single lens reflex cameras have built-in exposure metres which work through the lens. This is a great advantage as you obtain a correct reading even if bellows or extension tubes are used. This system is even better in those cameras where it is possible to obtain the exposure required for only the centre of the image. If this system is not used and extension tubes or bellows are fitted, the exposure with a 50mm lens must be increased as shown in the following table:

Extension	Focused on	Subject area	Magnification	Exposure (factor)	Increase (stops)
5mm	55	cm 36 x 24 cm	0.1	1.2	$\frac{1}{4}$
10mm	30	cm 18 x 12 cm	0.2	1.4	$\frac{1}{2}$
15mm	21.6	cm 12 x 8 cm	0.3	1.7	$\frac{3}{4}$
20mm	17.5	cm 9 x 6 cm	0.4	2.0	1
25mm	15.0	cm 7.2 x 4.8 cm	0.5	2.3	-
30mm	13.3	cm 6 x 4 cm	0.6	2.6	$1\frac{1}{3}$
35mm	12.1	cm 5.1 x 3.4 cm	0.7	2.9	$1\frac{1}{2}$
40mm	11.2	cm 4.5 x 3.0 cm	0.8	3.2	$1\frac{2}{3}$
45mm	10.5	cm 4.0 x 2.7 cm	0.9	3.6	-
50mm	10.0	cm 3.6 x 2.4 cm	1.0	4.0	2

The correct exposure is found by multiplying the shutter speed by the appropriate factor, or by increasing the aperture by the given number of stops.

On many occasions it will be found that natural illumination is not sufficient. In the laboratory, overrun tungsten lighting can be used but it is hot and it can be very awkward with macrophotography to get it onto the subject as required. Flash is therefore the answer in many cases. Flash bulbs are expensive, and little used, as it is now possible to obtain a low power electronic flashgun for well under £10. As most of the work will be at a few inches its power is quite sufficient. There is also an increase in sharpness of the fine detail when using flash. A sheet of thin paper in front of the flash will slightly soften the edges of the shadows and give a more pleasing result. This may be assisted, if there is weak daylight falling on the subject from another direction, by giving an exposure of up to  $\frac{1}{2}$  second. In most instances, if the flash is fired at 45 to 65 degrees to the subject this produces a good result without very dark shadows. In some very flat crustose lichens, just skimming the light across the surface will give a depth to the photograph that would be otherwise lacking. It is possible to fit brackets onto the camera to position the flash gun and also, on the other side of the camera, either a white board reflector or a lower power flash gun. If both flash guns are of the same power, one of them should be held at 2 to 3 times the distance of the first to prevent strong double shadows. Care must be taken if photographing on glass or with wet specimens that the flash does not reflect into the lens. Circular flash guns that fit around the lens may be an advantage where it is difficult to light the subject but it will be found that the result given by these flash guns is too lacking in shadow contrast to be of use, especially in monochrome photography.

If flash is not being used the long exposures that are often required means that a tripod is an essential. A tripod also enables you to compose the photograph with more care than can be done with a hand held camera. The tripod should be as rigid as possible but not so heavy that you are reluctant to take it out into the field. Any tripod is very much better than no tripod: a central column with a rack and pinion movement and adjustable head is vital as this is often the only convenient way of obtaining the small movements of the camera required. If this column is reversible so that the camera can be brought close to the ground between the tripod legs, so much the better. Although slower in operation, screw collar adjusted legs give greater flexibility and rigidity than snaplock legs and are to be strongly recommended. The use of a cable release or even better the self-timer helps to prevent camera movement.

There is little choice in photographing herbarium specimens which are glued down and may not be removed, and background shadows and the colour of the base card will have to be accepted. Where possible, the most adaptable arrangement is to photograph the specimen on a sheet of clear glass raised a few inches above the bench. This eliminates shadows and allows you to easily slip different coloured backgrounds underneath without disturbing the camera or specimens. It also enables you to work at a height above the bench at which you can use the rack adjustment on the tripod. The use of coloured backgrounds or coloured filters will greatly increase the contrast obtained in monochrome photography. Plasticine will be found to be invaluable as it enables the specimen to be positioned at the correct angle for depth of field, lighting etc. It can also be used to join the tripod to the glass background and if bellows are being used, the bellows to the tripod. This will damp down vibration and any remaining will vibrate in sympathy throughout the system and movement on the photograph will be reduced.

For most work the sometimes long exposures do not prove an inconvenience and filmspeed is not important. The fine grain of a slow monochrome film is more useful than speed, as frequently to obtain the depth of field required, a smaller image has to be accepted and this then has to be enlarged. If in doubt it is always worth over-exposing rather than under-exposing as without shadow detail the photograph is often almost worthless, whilst an acceptable print can usually be obtained from an over-exposed negative.

It is helpful to experiment with combinations of film and developer to find the one that gives the type of photograph you require. When possible use only this combination, as very often an unrepeatable photograph under difficult circumstances will be needed, and it is a great help to have confidence in the system being used.

Colour film for transparencies has much less latitude in exposure than monochrome or even colour negative film. It will be found that it requires rather flatter lighting using the colour contrast of the subject to give the best result. The make of film is a matter of experiment as each one gives a different result and is a question of personal preference. With all makes it must be remembered that in the early morning or late evening the light is much more red and although it may not be noticeable by eye in the field, it may give an unacceptable colour cast to the transparency.

It is possible to change the type of film in use in the camera. To do this you must standardise your threading technique and note the last number exposed, then rewind the film, taking care that the leader is not wound right into the cassette. If when the film is replaced you wind on one extra frame (having released the shutter with either the lens cap on or your hand over the lens) there should be no overlap of photographs.

A colour transparency may sometimes need to be copied to produce black and white prints. Equipment can be purchased for this purpose but unless a great deal of this work is required it is not usually economical to do so. The slide can be photographed on to fine grain film in an enlarger if the enlarger will focus down to the required size. If a camera is used the final result will depend on the quality of the lens used. The slide to be photographed should be mounted in an aperture in a piece of stout matt black card. This should be illuminated by light reflected from a piece of white card positioned behind the slide, or it may be possible to use the sky through a window, the light must be even over the slide and no other light should enter the lens or the image will be degraded. Vibration is a difficulty and care must be taken that the exposure is made at a time when it is at a minimum.

Although it may add to the difficulty, photographs of many foliose and fruticose species are best done in the field. If the specimen is only very slightly squashed or loses some of its soralia this will become very apparent in the photograph. If "gardening" has to be done, you should remove as little as possible of the surrounding vegetation being careful to leave no cut ends in the photograph. Look for out-of-focus objects in the background: these you often do not notice in 3 dimensions but may appear as distraction in the 2 dimensional photograph. Although not so important as when photographing flowering plants, if a rare species is photographed you should replace all vegetation to avoid drawing attention to the specimen. This also helps to restore the plant's micro climate.

Even with a good specimen it will be found that it is often difficult to get all the important characteristics in one photograph. It is however well worth the effort in order to obtain a photograph that has "the feel of the plant" both from a scientific and aesthetic point of view. It is hoped that these notes may inspire a few more lichenologists to discover the rewards of lichen photography.

F. S. DOBSON

#### Additions to list of regional experts

The following additions to the list of regional experts given in Bulletin 38: 8 (1976) should be noted:

Geographical areas: Irish Republic, south-west: P. McCarthy, Department of Botany, University College, Cork.

Counties/Vice-counties: Anglesey: A. Fletcher, Department of Marine Biology, University College of North Wales, Marine Science Laboratories, Menai Bridge, Anglesey, Gwynedd.

The Systematics Association's Special Volume No. 8 entitled Lichenology: Progress and Problems, edited by D. H. Brown, D. L. Hawksworth and R. H. Bailey, was published in April 1976. The volume gives papers from the international symposium held at the University of Bristol in April 1974. There are chapters on ultrastructure, algal morphotypes, lichen algae, developmental morphology, chemotaxonomy, dispersal, distribution, ancient woodland indicators, growth rates, urban studies, maritime ecology, ecosystems, sulphur dioxide and mineral uptake, nitrogen metabolism, symbiosis, etc. The publishers are Academic Press, London, and the book is £19.00, but is available for £14.25 to members of the British Lichen Society from Emily Wilkinson, Academic Press, 24 Oval Road, London NW1 7DX.

The Richmond Publishing Co. Ltd., Orchard Road, Richmond, Surrey TW9 4PD, issued in 1976 limited facsimile editions of MICHELI, P. A. 1729. Nova Plantarum Genera (£32.50 + £0.80 postage) and DICKSON, J. 1785-1801. Plantarum Cryptogamicarum Britanniae (£18.00 + £0.80 postage). Early ordering is advisable because the editions are very small. The company have recently increased the price of Duncan's Introduction to British Lichens (1970) to £5.50 or £6.05 including postage. They are shortly publishing Hawksworth and Seaward's Lichenology in the British Isles 1568 - 1975 which will be available for £16.65 if ordered before 30 September 1977, then £21.30. This work incorporates the data in the duplicated A Preliminary Bibliography of British Lichens (1976) by Hawksworth, Reid and Seaward.

Les Champignons Lichenicoles Non Lichenisés by G. Clauzade and C. Roux (1976) is available for 15 francs from Université des Sciences et Techniques du Languedoc, Laboratoire de Systématique et Géobotanique Méditerranéenne, Institut de Botanique, 5 rue Auguste-Broussonet, Montpellier, France. The book comprises a key to all known lichenicolous non-lichenised fungi.

The book Lichens as Pollution Monitors by D. L. Hawksworth and F. Rose was published by Edward Arnold in 1976 for £1.40 paperback and £2.80 hard back. It forms the Institute of Biology's Studies in Biology No. 66. As no previous knowledge is assumed, the book is especially valuable for those who wish to study the effects of pollution but have little lichenological knowledge. It deals with the collection and naming of lichen specimens, as well as their use as monitors.

A new edition of The Observer's Book of Lichens is scheduled for publication later this year and will be on sale in many bookshops.

A few copies of A. L. Smith's A Monograph of the British Lichens, edition 2 part 2 (1926) are now available from the Society for members only for £5.00 by hand or £6.00 post free. It may be ordered on the form at the end of this Bulletin. This work is available to non-members from Asher for fl.100 (nearly £24).

#### Ursula Duncan elected to honorary membership

The Annual General Meeting on 8 January 1977 elected Dr Ursula Katharine Duncan, an Arbroath farmer, to honorary membership of the Society. Several members paid tribute to her work and enthusiasm for lichens, and the help she has given to all, both through her books, the latest of which is the standard taxonomic work, and also at a more personal level through individual help in the field.

The Council decided in 1973 that the number of honorary members should be limited to five. The four other honorary members are Madame V. Allorge (elected to honorary membership in 1959), Professor Emeritus G. Degelius (elected in 1976), Dr Elke Mackenzie (formerly Lamb, elected in 1974), and Mr A. E. Wade (elected in 1971).

Report on lecture and exhibition meeting, 1977

The lecture and exhibition meeting, held after the Annual General Meeting on Saturday 8 January 1977 at the British Museum (Natural History), London SW7 5BD, was attended by 46 persons, including several non-members. The following exhibits were displayed:

DOBSON, F. S. More lichen photographs.  
DOBSON, MRS MARY T. V.C.44 Carmarthen lichens.  
GUTTERMAN, J. D. Herbarium catalogue.  
LAUNDON, J. R. & JAMES, P. W. Unique 18th century lichen drawings.  
RICHMOND PUBLISHING COMPANY: Bookstall.  
TOPHAM, PAULINE B. Cladonia delessertii and C. uncialis.  
TOPHAM, PAULINE B. Edinburgh computer mapping.  
WALLACE, E. C. An arctic lichen Dactylina arctica (Hook.) Nyl.

At the lectures in the afternoon, which were devoted to lichenologists past and present, the Vice-president, Mr Brightman, reported that the President, Dr Gilbert, was ill and confined to bed, and was regrettably therefore unable to conduct the meeting and to give his talk. Mr Coppins was unable to get to London and his lecture was therefore cancelled. Mr Wade felt unable to undertake the journey, but had kindly sent his talk to be read.

Mr P. W. Lambley spoke about some East Anglian lichenologists and their travels. He told how James Edward Smith brought the Linnaean collections to Norwich and how the "Norfolk School of Botany" developed, which mostly revolved around Dawson Turner and his relatives. Next Dr M. R. D. Seaward spoke on clerics and medics in 19th century lichenology, citing Rev Graham and Dr Swinscow as present examples of this tradition. He explained that the clergy studied botany because they had the time, books and education, and were observers of nature for use in their earthy sermons, whilst the medics continued the herbalist tradition having had a botanical education, were familiar with optical equipment and had a passion for diagnoses which fitted them well for botanical observations. James Dalton, James Gilchrist, Hugh Macmillan and Edward Woodruffe-Peacock were quoted as examples. Mr Brightman then read Mr Wade's paper, in which he reported on lichenologists and lichenology in Britain 1920 - 39. Mr Wade mentioned all persons who had worked on British lichens during this bleak period following the collapse of the Lichen Exchange Club which floundered for lack of support. He told how the publications of Miss A. L. Smith did much to raise the academic level of lichenology in Britain, and that her lichen exhibition drawers in the British Museum (Natural History) constituted the first public lichen exhibit displayed anywhere in the world. Following Miss Smith's death Walter Watson dominated British lichenology and provided considerable help to all workers in this field. Mr Wade contrasted the stable nomenclature of this period with the chaos of today.

Following the tea interval Dr D. J. Galloway spoke on lichenological exploration in the South Pacific 1770 - 1970, dealing entirely with New Zealand. He showed slides of the site of the birth of the Resolution in Dusky Sound in 1772 where the first published lichens were collected. Mr C. Knight was one of the most important 19th century collectors and sent his specimens for description to Nylander, but on account of the latter's rudeness later switched his loyalty to Müller. He mentioned that the largest and best collection of New Zealand lichens had been made by Du Rietz, and he concluded by paying tribute to the work of William Martin who had recently died.

## Picnic at Castellfullit de Riubregós

Jagged limestone hills covered with Pinus trees emerged from the mists below as the Trident came into land at Barcelona airport. It was warm and sunny as I stepped on to the tarmac, to be driven gently away down a winding coastal road to the tourist resort of Sitges to begin the British Lichen Society's field meeting in Catalonia (Spain) in September 1976. The European members mostly arrived by train, the British people flew, whilst David Richardson arrived by boat having sailed all the way from England. About 17 people took part in the meeting.

The party stayed at the Bahia Hotel in Sitges which was comfortable with pleasant if unadventurous food. I shared my room with a party of tiny ants which were nesting in the wall and took a liking to my fruit juice. The tap water was salty and undrinkable, but fortunately bottles of water were available for sale in the shops.

On the afternoon of the day of arrival, a short visit was made down the coast road to Cunit in the direction of Tarragona. Here Xavier Llimona showed us Diringa ceratonia dominating the bark of the leguminous tree Ceratonia siliqua. The next day, 2 September, was spent studying some massive sandstone outcrops at Penya del Moro in remote and isolated country, although almost on the outskirts of Barcelona, with spectacular views over the multiple green of the woods and browns of the field cultivations, with the trilling of alpine swifts overhead.

The next day we undertook a long drive to Montserrat in hired cars; the party did its best to rearrange itself according to those who preferred the journey with the windows open, and those who preferred them closed. A stop was made at Elsa A Brucs, a little to the west of Montserrat, to collect from lichen-rich areas on calcareous earth dominated by the sweetly aromatic Thymus vulgaris. Here we saw the delightful reindeer lichen Cladonia mediterranea on Pinus halepensis litter, as well as a fine covering of Lecidea decipiens and various species of Cladonia, Diploschistes, Fulgensia and Squamarina making a colourful terrain. Montserrat forms a spectacular massif of pudding-stone rising vertically to 1236 m above the plain. The rocks form striking regular conical shapes of immense height which appear smooth and bare when viewed from a distance, but were covered with lichens in sheltered places. The ascent and descent was made by cable-car.

On Saturday 4 September a long drive was undertaken to Castellfullit de Riubregós to visit terricolous communities on gypsum. Here the landscape was rather bare with old gypsum workings of hill and dale extending for mile after mile. The lichen flora was unique and quite remarkable, for a number of peculiar species are confined to gypsum. Species of Acarospora, Diploschistes, Fulgensia, Lecidea, Lepraria and Squamarina covered the crumbling calcareous rock and earth, the ground appearing too dry for a continuous cover of phanerogamic vegetation. After a stop in a gorge at Tora de Riubregós we began the long car journey back to Sitges. After a mile or two, near Artesa de Segre, there was a sudden crash and my lap was filled with glass: the windscreen of our hired car had shattered. A lengthy stop followed for the removal of the broken glass, and we then went to some shops in the next village in order to buy sunglasses so that David Richardson could continue to drive the damaged car the 140 km (c. 90 miles) back to Sitges. As the evening wore on the four of us became colder and colder and hungrier and hungrier. Margaret Blackwood and Pauline Topham covered themselves with newspapers to keep warm, whilst a huge bunch of ripe juicy black grapes mysteriously appeared through the car window-space in order to sustain us. Darkness fell and navigation became quite difficult as we tried to follow the map by the weak light of the moon. We reached Sitges at 22.00 after a most memorable journey some two hours behind schedule, to find the rest of the party still awaiting us before beginning their evening meal.

The next day was spent at Prades near Montblanch where the woodland was very rich in lichens, including species of Lobaria. On Monday 6 September the drive to the Pyrenees was undertaken; an excellent dinner was obtained at Vich on the journey. The ascent to the monastery at Nuria was undertaken on cog-wheel railway

and the contrast in weather, hot, sunny and dry below and cold, thick mist, rain and darkness above at the other end of the short line had to be experienced to be appreciated. At the monastery the accommodation was amongst the most primitive and dirtiest in Europe, where even the bottles of drink were encrusted with mice droppings, and where one member had all their money stolen. A stay at Nuria was guaranteed to convert the best Christians to fervent atheists. Next day we were up just after six and ate some scraps for breakfast in our bedrooms before beginning the long walk up to the mountain summits. An eerie stillness surrounded us as we stumbled and slithered over the icy hillsides in the dark. Soon the sun rose and a glorious day followed as we collected arctic-alpine lichens on the top of the Pyrenees on the Spanish - French border.

The meeting was most enjoyable and a wealth of interesting lichen material was seen and collected. All those taking part owed a great debt of gratitude to Dr Xavier Llimona for arranging and leading the meeting, to Dr Jean Margot for acting as Treasurer and for doing many difficult financial calculations, and to Dr Llimona's students for acting as drivers and having to put up with some nervous passengers. All who took part considered it one of the most interesting lichen meetings that they had been privileged to undertake. It is expected that Dr Llimona will be able to write a scientific account of the meeting for publication elsewhere.

#### Kuopio meeting on air pollution

A most successful meeting on 'plant damages caused by air pollution' was held at the University of Kuopio, Finland, from 16 - 18 August 1976 under the direction of Professor Lauri Karenlampi. One day was devoted to lower plants, when eight papers of direct interest to lichenologists were given. These included valuable accounts of synergistic effects, the use of infra-red colour photography, further information on the importance of habitat factors in modifying the relative effects of air pollution, physiological and structural work, and the behaviour of Bacidia chlorococca in Wien, this being particularly stimulating. The proceedings have been published jointly by Kuopion korkeakoulu (University of Kuopio, P.O.B. 138, SF-70101 Kuopio 10) and Kuopion Luonnon Ystävien Yhdistys. Copies may be obtained from the librarians of the publishers in exchange for reprints of a botanical and ecological nature; one has been donated to the BLS library. During the meeting Lecanora conizaeoides was found on a birch tree in Kuopio, the first record for central Finland.

O. L. GILBERT

#### P - a new danger?

The toxicity of para-phenylenediamine is already well known to lichenologists but recent research into the possible side-effects of hair dyes (many of which contain phenylenediamines) has shown that it is also carcinogenic to laboratory animals (see Venitt & Searle 1976). While there is as yet no direct evidence that P is either carcinogenic or mutagenic to man, it would be sensible to take extra precautions when using it as an indicator in lichen chemistry. It is advisable for regular users to wear rubber gloves to avoid the possibility of absorption through the skin, and from the safety point of view a solution, rather than crystals dissolved in alcohol, minimizes the danger of inhaling para-phenylenediamine dust. For a solution Hale (1976) suggests 100 ml. water:  
10 g sodium sulphite: 1 g para-phenylenediamine: 40 drops of any liquid detergent.

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J. L. CLEDEN

## Lichen Society outstrips BBS

The study of lichens is now more popular than the interest in mosses if the membership figures of the British Lichen Society and British Bryological Society are any guide. The Bull. Br. Bryol. Soc. 28: 2 (1976) remarks that the membership of the British Bryological Society at 31 December 1975 was 486, including 36 institutional and 9 exchange members, thus implying that the BBS has 441 individual members. By the same date the individual membership of the British Lichen Society was 460.

The British Pteridological Society had a comparable membership in 1976 of about 440 individual members out of a total of c. 520, including institutions. Other botanical societies are well ahead: British Phycological Society: c. 600 members, British Mycological Society: c. 1500 members and Botanical Society of the British Isles: c. 2400 members. Apparently cryptogamic plants are more popular than flowering plants, for the combined membership of the cryptogamic societies far outstrips that of the BSBI.

## Death of William Martin

William Martin of Dunedin, New Zealand, died on 6 July 1975. He was born at Fairfield plant nursery, Dunedin, on 23 October 1886. As a young man he adopted a rigorous daily routine, teaching at Ravensbourne School during the day which involved a cycle ride of 38 miles, and attending university classes on his way home; he would sit down to dinner at 20.00 and do school work and 'swot' until midnight. After graduation he continued his teaching career and gained great distinction as an educator, without the intervention of a single day's illness. On retirement at 60 he took up the study of mosses having concentrated on flowering plants before this time. It was not until he was 70 that he began to consider lichens seriously, when he decided to specialise in the genus Cladonia. He published several important papers on this genus, and finally, in collaboration with John Child, brought out the book Lichens of New Zealand in 1972. His lichen collections are preserved at Christchurch (CHR). He probably did more than other persons to popularise New Zealand botany. An obituary, by D. J. Galloway, has appeared in Bryologist 79: 374 - 376 (1976), and another, together with a bibliography, is published in N.Z. J. Bot. 14: 367 - 374 (1976).

## Tasmania: copper smelting and pollution

"The countryside around Strahan is covered with dense vegetation but such is not the case when one approaches Queenstown either from Strahan to the south-east or over the Lyell Highway. The traveller is quite stunned with the barrenness of the landscape. The whole area once abounded with trees, but they were cut down to supply fuel to the smelters and various chemical pollutants did the rest. With the disappearance of all the trees and grass, the topsoil was washed away leaving only rocky outcroppings. It is said that when free trips are being offered to the moon the Queenstown population will decline firmly, saying that they have already experienced lunar landscape. Despite the fact that all vegetation is gone and this seems to include even lichens, although there are reports that some of this is slowly returning to the rocky surfaces - the whole scene is not without beauty. The colour of the rock formation, a glowing pink in certain lights, is quite unusual." (pp. 170 - 171).

JACKMAN, S. W. 1974. Tasmania. David & Charles, Newton Abbot.

R. O. MILLAR

## New Members

- The following new members joined the Society between October 1976 and March 1977.
- F.M. = Family member.
- Mr J. W. Case, Department of Biology, University of Calgary, CALGARY, Alberta T2N 1N4, Canada.
- Dr J. A. Elix, Department of Chemistry, SGS, Australian National University, P.O. Box 4, CANBERRA, A.C.T. 2600, Australia.
- Dr T. L. Esslinger, Department of Botany, North Dakota State University, FARGO, North Dakota 58102, U.S.A.
- Mr G. Guy, 63b Braids Road, St Andrews, HAMILTON, New Zealand.
- Mr T. D. Harrison, 6 Sunnyside, West Lavington, DEVIZES, Wiltshire.
- Mrs M. Harrison, 6 Sunnyside, West Lavington, DEVIZES, Wiltshire. (F.M.)
- Mr A. D. Hodgkiss, 34 Wilton Crescent, ALDERLEY EDGE, Cheshire SK9 7RG.
- Mr V. John, Bau 2 Botanik, Universität des Saarlandes, D-6600 SAARBRÜCKEN - 15, Germany.
- Mr L. Källsten, Karlsrogatan 1 nb, S-752 38 UPPSALA, Sweden.
- Mr P. R. Kaucher, 1008 Gaskins Road, CINCINNATI, Ohio 45245, U.S.A.
- Mrs J. H. J. Krüger, Dorpsstraat 20, COTHEN (U), Netherlands.
- Mr J. R. Mason, Borden Laboratories, Shell Research Ltd., SITTINGBOURNE, Kent.
- Dr P. Morisset, Department de Biologie, Faculté des Sciences, Université Laval, QUEBEC, Québec G1S 2C1, Canada.
- Mr T. Moxham, 592 Wellsway, BATH, Avon BA2 2HE.
- Mr E. J. Redshaw, 7 Fennell Road, Pinchbeck, SPALDING, Lincolnshire PE11 3RP.
- Mr J. D. Rowson, 10 Redacres, Tettenhall, WOLVERHAMPTON, West Midlands WV6 9PE.
- Mrs C. K. Schmitt, One Cedar Lane, SCOTIA, New York 12302, U.S.A.
- Ass. Professor Dr W. Seitz, 16.1. Botanik, Universität des Saarlandes, D-6600 SAARBRÜCKEN - 15, Germany.
- Mr T. Tønsberg, Botanisk Institutt, Universitetet i Trondheim, Norges Laererhøgskole, 7000 TRONDHEIM, Norway.
- Mr S. L. Toyn, Lower Branscombe House, Ebford, Topsham EXETER, Devon.
- Dr R. Türk, Botanisches Institut, Lk II Univ. Salzburg, Lasserstr. 39, A 5020 SALZBURG, Austria.
- Ms V. E. Williams, Craneswood, Cornwood, IVYBRIDGE, Devon.

## Military victory for lichens

In February 1797 Wales was invaded by a French army which, under the direction of an American Colonel Tate, sailed up St George's Channel and landed at the port of Fishguard, intent on wrecking havoc and destruction. This surprise attack went almost unopposed but the French army mistook the red, cudbear (lichen) - dyed cloaks of a number of distant Welsh women mounted on hill ponies for the uniforms of advancing battalions of regular soldiers. This optical delusion greatly influenced their decision to surrender, which they did to Lord Cawdor without striking a blow. The important role of lichens in this bloodless victory appears to have gone unrecorded except for a few lines on p.204 in Rambles in Search of Flowerless Plants by Margaret Plues (1864).

While on military matters it is interesting to recall that the vernacular name for Cladonia cristatella in Pennsylvania, U.S.A., is "British soldiers", the red fruits recalling the colour of the once-feared British soldiers' uniforms.

O. L. GILBERT

Literature on lichens - 28

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## Report of the Conservation Committee for 1976

The activities of the committee during the last year were dominated by preparation for a revision of lichen sites. A new proforma was prepared with the aid of our Nature Conservancy Council members. Regional Officers of the NCC have been advised of our revision and all have responded with useful comments. These are valuable because there have been few submissions from the members of the Lichen Society, and hence the committee has had to rely on the knowledge gained by Peter James and Francis Rose on their peregrinations round Britain. It is hoped that a leading article by them will be published in a future Bulletin.

The modern cult of the expert is perhaps reflected in the difficulty of finding members willing to evaluate threats to localities brought to the attention of the committee. Sometimes such sites are not investigated, for, with our experts predominantly based in London, both time and money are at a premium when it comes to visiting remote rural areas. Not all requests require a species list from the site and under such circumstances even a purely geographical report, with the type of lichen assessment made in the pollution survey done by schools, would be valuable.

The committee Secretary occasionally receives requests for information about the location of sites of special interest within counties. Such information is not divulged by the committee without personal knowledge of the individual and their aims. The preservation of a locality has ultimately to be the responsibility of the NCC, National Trust, and voluntary local bodies such as the county trusts. We inform all such bodies of any site we think is of interest in their area, and, as a national society, try and add weight to their activities when such sites are under threat.

F. N. HAYNES

## Secretary's report for 1976

The membership is now 492, the highest in the history of the Society. The previous record was 480, which was reached in 1972. Fifty-nine new members joined during the year which is the largest number since 1966. This is particularly encouraging in view of the general economic climate at a time when living standards are being reduced.

The Society's meetings went according to plan and were reasonably well attended. Mr F. H. Brightman, Dr O. L. Gilbert, Dr X. Llimona, Mr R. O. Millar and Mr K. C. Side are thanked for arranging and leading these excursions. One of these was held in Spain where the lichen floras of the Mediterranean and Pyrenees were studied.

Two parts of The Lichenologist were published, and both maintain the high standard for which the journal is renown, thanks to the Editor Mr James, Assistant Editor Dr Hawksworth, the authors and the publishers Academic Press. Two numbers of the Bulletin were issued, including an address list of all members. The Royal Society is thanked for a grant towards the binding of the F. A. Sower bequest in the Society's library. I would like to conclude by thanking all officers and members for their help and co-operation during the year.

J. R. LAUNDON  
Honorary Secretary

(This report was presented at the Annual General Meeting on 8 January 1977)

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