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C O N T E N T S

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THE SPRING MEETING, 1984, BRECON

From the initial get-together in the bar at the Castle, this promised to be a memorable meeting and the enthusiasm both of the members and the weather subsequently made this a reality. All sites visited were in v.-c. 42.

The chosen sites all lay within the Brecon Beacons National Park and it was thought to be appropriate that on the Thursday morning, **12 April**, an introduction to the area's geography and geology should be given at the mountain centre at Libanus. In the event, the member of the NP staff who was to have given the talk was not available and Ray Woods, our local member and assistant Regional Officer for the Nature Conservancy Council in Breconshire, gave a brief introduction to the week's programme.

A short distance away was the first site, Traeth Mawr, a small raised mire with peripheral wet flushes, managed as a reserve by the Brecknockshire Naturalists' Trust. Here Scorpidium scorpioides was much in evidence in the peaty flushes along with Drepanocladus revolvens, *D. exannulatus var. exannulatus and Plagiomnium elatum. The raised mire supports seven common species of Sphagnum growing amongst which was noted Odontoschisma sphagni and Mylia anomala, now scarce species in mid-Wales due to the general decrepitude of peatlands. Find of the week was possibly Joan Appleyard's *Dicranum leioneuron previously only known in Wales from raised mires in Cardiganshire. Lunch was a rewarding experience for some of us, taken on a roadside verge surrounded by Hypnum lindbergii and Archidium alternifolium.

After lunch, a move was made to the River Usk, a few miles east of Sennybridge, where we were joined by a number of members from the Reading area and the afternoon was spent searching the river-banks and boulders, the latter well exposed due to the low water level. Orthotrichum rivulare was abundant on riverside trees, from where Tortula subulata var. subinermis was also recorded. An old record for Epipterygium tozeri was confirmed and Ulota phyllantha, a scarce species in mid-Wales, was also seen.

13 April. The River Nêdd at Pont-melin-fach below Ystradfellte was the venue. This wooded valley is owned by the Forestry Commission but the area near the river is relatively undeveloped. Downstream from the bridge the rock is Millstone grit with a characteristic 'acid' bryophyte flora, and luxurious patches of Jamesoniella autumnalis and Dicranum fuscescens were not uncommon on the trees and rocks. On a stump was found Dicranum flagellare, a second county record, and other notable species included Dicranodontium denudatum and fruiting Diphyscium foliosum. Lunch was delayed to allow a visit to be made to a most impressive waterfall a few hundred yards further downstream.

Upstream, in complete contrast, the rocks were flushed with lime-rich water and prolific growths of Neckera crispa hung in curtains from the outcrop, providing a very different impression of a plant familiar to those living near the chalk grassland of the south-east. Eucladium verticillatum and Cratoneuron commutatum var. commutatum had reacted with the water to produce large deposits of tufa, forming a substrate for Cololejeunea calcarea. The high relative humidity and possible absence of recent disturbance was reflected in the presence of Bazzania trilobata and both Wilson's and Tunbridge filmy ferns.

14 April. Saturday found the party, now 28 in number, at Craig-y-Rhiwarth in the River Tawe valley near Craig-y-nos Country Park. The initial climb up the hill from the carpark was through dry limestone woodland. Nowellia curvifolia was seen in an uncharacteristically exposed position whilst logs elsewhere in this wood proved fruitful with Dicranodontium denudatum, Tritomaria

exsectiformis and Lophozia incisa recorded, the latter two by Jean Paton.

Lunch was enjoyed in brilliant sunshine, sheltered by the ridge from a cutting east wind. A descent through a natural rock arch resulted in the rediscovery of the near century old record Tortella nitida made by the Rev. A. Ley. On shaded, wooded cliffs Seligeria acutifolia was noted, here in a new locality remote from all its previously known Brecknock sites. Other species of note seen during the day included Scapania aspera, Riccia warnstorfii and Orthothecium intricatum.

Time allowed a short vist to the National Trust-owned Henrhyd Waterfall; the gorge of the Nant Llech here cut into coal measure shales and sandstones. Intrepid members examined the rocks behind the falls and in the gorge below. The abundance of Leiocolea bantriensis and Blepharostoma trichophyllum was notable, together with Tetrodontium brownianum on damp shaded rocks. Fissidens celticus was observed on a steep bank by the path.

15 April. On Sunday the banks of the River Usk were again visited, at Llangynidr Bridge, where the character of the river is quite different and large sandstone boulders are a feature. A search above and below the bridge produced Schistidium alpicola var. alpicola, Bryum gemmiparum (a national rarity not seen in the county since 1914), Pohlia lutescens, Epipterygium tozeri, Fissidens crassipes (second county record), F. rufulus, Barbula trifaria and B. spadicea. On trees bases Orthotrichum sprucei, O. rivulare and Scleropodium cespitans were frequent.

In the afternoon, the nearby Tal-y-bont reservoir was the centre of attention but the banks proved unrewarding and the party split up to examine the head water streams and cliffs of Craig-y-fan Ddu. Richard Fisk's discovery of Splachnum sphaericum on sheep dung, apparently not previously noted from the Beacons, was the only notable find.

16 April. Monday saw a return to the limestone, to the cliffs and quarries of Dyffryn Crawnon. Hail showers pursued the party up the valley, where part of the steep, predominantly ash, woodland is a Naturalists' Trust reserve. The quarries above, which had been worked in the recent past for limestone, proved disappointing owing to the extreme dryness; however, the line of the tramway above and below less disturbed cliffs was followed round the head of the valley until the transition to the Old Red Sandstone was indicated by the abundance of fruiting Bartramia pomiformis. Species of note on the limestone included Seligeria pusilla, S. acutifolia and Encalypta vulgaris. The party split, those returning to the valley floor noting beneath a limestone face, Orthothecium intricatum and Plagiopus oederi. A more wide-ranging group recorded Lophozia excisa, Riccardia palmata, R. sinuata, Cephaloziella hampeana and Mnium marginatum. Marcus Yeo collected a Scapania which Jean Paton confirmed to be *S. lingulata, new to Wales. The ash woodland provided few notable epiphytes, Pterogonium gracile being the exception.

P.J. PORT & R.G. WOODS

17 April. Although the wind had changed to the South for the last day, it was still cool and became cloudy, after a clear start. The approach to the Pen-Moel-Allt woodlands involved a circuitous and somewhat alarming convoy through the back streets of Merthyr. The clay-and-gravel track had Archidium alternifolium, and soon limestone appeared in the banks and walls with large cushions of Ctenidium molluscum, Barbula recurvirostra, well-grown Neckera crispa, and other species for the recording card. Soon, our party - of thirteen - cut down through very dense Larch to the north end of the Pen-Moel-Allt cliffs, a north-east facing scarp of Carboniferous limestone overlooking

the Afon Taf Fawr. The scarp consists of a series of low limestone cliffs above steep - and rather slippery - slopes of clay and scree, with open Ash, Wych Elm, Oak and Hawthorn on and between the outcrops. To southward the slope steepens, and a tall cliff at some 300m altitude forms the major outcrop. In the many dry and damp habitats present bryophytes were abundant, with such species as Scapania aspera, Thamnobryum alopecurum, Plagiochila britannica and fruiting Ctenidium molluscum. Small species of the bare rock were Seligeria acutifolia, Cololejeunea calcarea and Tortula intermedia. In cracks and on soil-covered ledges was a rather confusing form of Trichostomum brachydontium. In general the cliffs were dry, and in only a few places was water-seepage evident, with Orthothecium intricatum and Jungermannia atrovirens. On trees were good growths of Lejeunea cavifolia, and one alert member spotted two patches of Ptilidium pulcherrimum on an oak-trunk. Besides the 105 species of bryophytes we saw fine colonies of all three Polypodium ferns, and Mr Nethercott pointed out Sorbus leyana, a Whitebeam microspecies completely restricted to this valley, and the local S. rupicola.

Later in the afternoon on the return to Brecon we stopped at a gully on Craig Y Fro, a frowning rough cliff by the road just north of the pass. The time available, however, proved totally inadequate, and we retreated with fine fruiting Isopterygium pulchellum as perhaps the best find. The richness of this area was in fact revealed by a "splinter-group" of three members, who spent the whole day on the nearby - and much more extensive - Craig Cerrig-gleisiad, recording 150 species. Among many good finds were Eremonotus myriocarpus, Anoectangium aestivum (c.spor.), Grimmia torquata, and Isopterygium pulchellum.

In the evening eleven remaining members were made welcome at a restaurant in Brecon. We had a room to ourselves, and a most pleasant meal, amongst other things memorable for the sight of certain ladies of the group in evening attire, and for the production, from somewhere, by one of these ladies, of a pocket-lens to identify an ambiguous object in someone's sweet-course. The meal proved a very satisfactory way to round off the week: we toasted the health of the hard workers who had arranged for us such a varied and successful week - especial thanks to John Port, local secretary, and Ray Woods, NCC representative, who chose the sites so well.

F.J. ROBERTS

THE SUMMER MEETING, 1984, WOOLER

Northumberland was last visited by the BBS in 1963, and it had been well studied by Miss Lobley and J.B. Duncan before that time. It is therefore well known bryologically and we did not expect new records to be found easily. However, it is a county with a good range of different habitats even though the rainfall is not so high as more westerly areas. The rainfall was particularly low for some months before the meeting, and the six members attending found the bryophytes were mostly very dry. Weather that is bad for bryophytes is not necessarily so for bryologists, and if the drought caused some inconvenience it also brought the benefits of fine warm days for all of the excursions. All localities visited, except Grasslees Wood (v.-c. 67), were in v.-c. 68.

19 July. The Henhole, Cheviot. The party began by exploring the peaty banks and flushes of the College burn below Henhole, where Meesia uliginosa was found with sporophytes. The weather was overcast and cool enough to allow easy climbing up to the rocks on the North facing side of the valley. Here Peter Martin discovered Rhabdoweisia crenulata, while Grimmia torquata and Funaria obtusa were also found on and among the rocks. The saprophytes Tetraplodon

mnioides and Splachnum sphaericum were noted on the screes and Robin Stevenson found *Hygrohypnum dilatatum in the stream. As might be expected, the flushes were rather dry which perhaps led us to overlook some species, particularly the hepatics. Barbilophozia barbata was found, however, and the three more common species of Gymnomitrion, G. concinnatum, G. crenulatum and G. obtusum. The day ended in warm sunshine with the party exploring the crags of Braydon hill. These yielded more Splachnum sphaericum but were too dry and acidic to support a very varied flora.

20 July. Below the ruins of Norham Castle, the River Tweed forms a natural boundary between England and Scotland. Here the party explored the boulders and wooded banks on the Northumberland side of the river, in search of the elusive Hyophila stanfordensis and other rarities. Although known from the area it was not found, and Tortula muralis var. aestiva which had been expected (and promised) also failed to materialise. This variety has long been known to occur at Norham and was collected as recently as 6 months before the meeting. In all of the places that I had previously seen T. muralis var. aestiva, however, only the var. muralis could be seen! I suspect that the dry summer may have resulted in a change of phenotype, but my observations continue. Marcus Yeo justified the visit by finding Barbula nicholsonii and Gyroweisia tenuis on boulders by the river before the party moved on to Holy Island to eat a packed lunch by the sea.

In the afternoon bryology was hampered by several factors. Firstly, all the bryophytes were quite dry except in the wettest of the dune slacks and secondly, being almost on the beach on such a glorious summer afternoon, everyone felt the attractions of traditional seaside pursuits. Nature was against us too, and had produced a fine display of Orchids (including Epipactis palustris) and butterflies (Dark green fritillaries, blues and Graylings) to distract us. The group displayed great single mindedness and compiled a reasonable species list. They were rewarded with Catoscopium nigritum, Petalophyllum ralfsii and Moerckia hibernica. *Campylopus introflexus was no doubt previously overlooked as it was noted in several other localities during the week. Giles Clarke, Marcus Yeo and I left to spend the remainder of the afternoon at Newham Fen, an ancient woodland fragment now managed by the Nature Conservancy. The fen was almost inpenetrable in parts with dense undergrowth which precluded the development of a diverse bryophyte ground flora. A central clearing proved to be rich in orchids (and horseflies) and provided more species for the rather meagre list. It was rumoured that the remainder of the party were delayed in a Lindisfarne Tea Room. In any event the rest of the week was beset with seditious talk of cream teas!

21 July. The Bizzle, Cheviot. Joined for the day by David Long, the group enjoyed a full and energetic day of bryology. The Bizzle was found to be the meeting's richest locality and proved an interesting comparison with the adjacent Henhole. In contrast to the peaty flushes in the lower parts of the Henhole, the lower reaches of the Bizzle burn had earth banks and provided different habitats. David Long soon located *Fossombronia fimbriata (new to England) and *Haplomitrium hookeri here, and further upstream more basic rock was found than on the Henhole excursion. *Cololejeuna calcarea was collected on the rocks at the northern end of the crags, together with Grimmia incurva and Schistidium strictum. Further along the crags some species seen at the Henhole were found again, but *Scapania aequiloba, *Leiocolea heterocolpos, Dryoptodon patens, Philonotis arnellii, *Anomobryum filiforme var. concinnatum, Pseudobryum cinclidioides and Radula lindenbergiana were new. Undoubtedly, many of these finds were due to the additional expertise of David Long, but the overall impression was that good bryophyte habitats in the Bizzle were more abundant than in the Henhole. Near the head of the ravine several members collected Kiaeria blyttii on boulders, Marchantia alpestris in a flush and Blasia pusilla on a soil bank. At this point, overwhelmed by new finds, half

of the party decided to descend, while the other pressed on to the summit of Cheviot. This proved to be only a few hundred yards away and Pohlia ludwigii and Sphagnum fuscum were found on route.

22 July. A more relaxing day, the morning of which was spent at Black Lough, a bog on Alnwick Moor. The peaty hollows, surrounding farmland and a hillside flush provided a respectable list of species but no rarities. Again drought was a problem and much of the Sphagnum surrounding the pool was so dry that it disintegrated when touched. A nearby pasture was chosen for lunch, after which Richard Libby found he had been sitting on Leptodontium flexifolium, which was a welcome addition to the species list.

Callaly Craig, a north-facing sandstone escarpment, was investigated in the afternoon. The acid sandstone boulders provided enormous quantities of Orthodontium lineare, and also Dicranum fuscesens, D. majus and D. scoparium growing side by side. Like a textbook demonstration, the three species were easy to distinguish by eye. At the summit of the ridge Lepidozia cupressina was very abundant growing with Bazzania trilobata. *Kurzia sylvatica was found here on a damp shaded ledge, the only new record of the day.

23 July. An active day began exploring the River Alwin in the Kidland Forest where Orthotrichum rivulare and Schistidium alpicola were found on boulders by the river. Following Allerhope burn upstream to Raven's Crag, we recorded a considerable number of saxicolous moss species, most notably Encalypta ciliata, Cynodontium bruntonii, Amphidium lapponicum and Grimmia donniana. Robin Stevenson also found Apometzgeria pubescens in rock crevices. Somewhat reluctantly the group moved on to the waterfall at Linn bridge where Eric Watson and party were already bryologising. The riverside rocks and rock ledges were bound to be rather dry, but Eric Watson found Grimmia affinis, Marcus Yeo Orthotrichum rupestre and Peter Martin *Fissidens rufulus.

Grasslees Wood (v.-c. 67) a semi-natural birch-alder woodland near Elsdon was visited in the afternoon. A comprehensive species list was obtained for the Northumberland Wildlife Trust who now manage the wood as a wildlife reserve. Giles Clarke discovered Ptilidium pulcherrimum and Dicranum montanum on birch trees, while crags above the wood supported Lepidozia cupressina and Bazzania trilobata.

24 July. The morning was spent at Roddam Dene, a steep-sided wooded valley on conglomerate rock. The rocks and fallen trees made access difficult but *Hypnum mammillatum, Barbula spadicea, Nowellia curvifolia and Gyroweisia tenuis were noted. Unfortunately early records of Rhabdoweisia crenulata and Ulota drummondii were not confirmed.

In the afternoon another Cheviot locality, the Harthorpe Valley, was visited. We were again joined by Eric Watson, who explored Harthorpe burn while the main party concentrated their attention on Easter dene near Langlee. The dene contained many basic rock faces which supported Distichium inclinatum and Gymnostomum aeruginosum. Cynodontium jenneri was quite abundant on rocks and turf ledges but no trace was found of Rhodobryum roseum previously recorded from this locality.

The meeting was suitably concluded with a substantial five course meal at the Ryecroft Hotel.

PHILIP LIGHTOWLERS

THE PAPER-READING MEETING, 1984, BIRMINGHAM

In the attractive setting of the Manor Hall of Residence, about fifty members enjoyed what can be fairly described as a bryological compendium, for the programme encompassed a vast range of current activity in the subject. They heard how some of the most modern and sophisticated of techniques have been brought to bear on the meaning of oblique cross walls in caulonemata and of endophytic fungi in hepatics. They heard, also, a critical and useful assessment of additions to the British flora that have been identified by astute observers. Our fascination with the British flora, however, was ably transferred overseas by one of our honorary members, who described his long-standing and continuing interest in liverworts of Africa, and by another speaker, who introduced us to the bryophytes of the Adirondack Mountains. The audience politely accepted a substitute paper on bryophyte sex-chromosomes, and all of us were enchanted by the joint presentation, by two further speakers, of stereoscopic photographs. Summaries of all these papers follow.

Dr. J. DOONAN (John Innes Institute): "The microtubule cytoskeleton of Physcomitrella patens."

Indirect immunofluorescence can be used to visualize the microtubule cytoskeleton of cells within intact colonies of Physcomitrella patens. Microtubules are proteinaceous fibres which - by providing a cytoplasmic scaffold - play key roles in many morphogenetic processes in all eukaryotes. Studies on microtubules in mosses have concentrated on their role in the control of tip growth of protonemata, and how the re-orientation of cross-walls is related to development.

Protonemata grow solely by tip growth: therefore the mechanism by which tip expansion, as opposed to uniform expansion of the entire cell surface, is of interest in terms of morphogenesis. At the tip, microtubules extend into and completely fill the apical dome where they appear to end as foci. When treated with a carbamate herbicide (CIPC) which supposedly interacts with microtubule-organising centres (MTOCs) the tips become swollen, at the same time as the microtubules display aberrant distributions such as asters and starbursts. Disruption of MTOCs, therefore leads to misshapen tip cells.

Caulonemata possess oblique cross-walls whereas chloronemata have transverse cross-walls. The process of cross-wall re-orientation, is foreshadowed at anaphase by a large increase in the numbers of spindle pole to cortex microtubules. These are associated with a tilting of the mitotic spindle and this oblique device is then separated by a correspondingly oblique cross-wall. Treatment with anti-MT drugs prevents their appearance, and also prevents the re-orientation. The orientation of the cross-wall is controlled by the direction of light, such that the leading edge of the oblique cross-wall is closest to the light source. During side branching in sub-apical cells, the nucleus returns to the cross-wall and divides so as to form a side branch on the side wall nearest the leading edge of the cross-wall. The side branch is thus initiated in the direction of the light source present when the mother cell was formed. The microtubular cytoskeleton plays a major role in re-orientation of the cross-wall, migration of nucleus to the site of division as well as in division itself.

The study of the cytoskeleton may lead us to a fuller understanding of how the morphology of plants is controlled at the macro-molecular level.

Mr A.C. CRUNDWELL (Headley Down): "The introduced bryophytes of the British Isles."

We shall never have a complete knowledge of the bryophyte floras of past ages nor learn exactly how those species that did not survive the Ice Age within the British Isles reached these shores. For practical purposes we may accept as native all species that were here before about 1500 A.D., when traffic with North America and South Africa started to become significant.

The evidence that a particular species is an introduction is never direct, but always circumstantial. This evidence is of six kinds:

1.) Absence of a subfossil record.

2.) Evidence of a change in geographical distribution. This may take the form of persistence for a few years in one or two localities, followed by disappearance; or of presence in well searched localities where it was not seen before; or of increase in the number of localities, especially when these radiate from a single point.

3.) Anomalous geographical distribution, either on a world scale, such as the occurrence in England of a Southern Hemisphere species, or locally, such as the occurrence of a species in only one field when there is no conceivable ecological reason why it should not be in others.

4.) Association with some means of introduction, such as a botanic garden or a port.

5.) Less than the normal amount of genetic variation in the British population; sometimes in dioecious species only one sex is present.

6.) Association with open, disturbed or temporary habitats.

Of course none of these criteria is absolute, and there is plenty of room for dispute about the status of individual species.

Thirteen species may be definitely accepted as introductions, or at least as recent immigrants: Riccia crystallina, R. rhenana, Telaranea murphyae, Lophocolea bispinosa, L. semiteres, Atrichum crispum, Campylopus introflexus, Tortula amplexa, T. rhizophylla, Grimmia crinita, Orthodontium lineare, Bryum apiculatum agg. (found on St Mary's, Scilly, in 1977) and Eriopus apiculatus. There are four more that may well be introductions, but less certainly: Tortula freibergii, Hyophila stanfordensis, Trichostomopsis umbrosa and Gyroweisia reflexa. The four following have been suggested as introductions but are more probably native: Fossombronia incurva, Telaranea nematodes, Campylopus pyriformis and Tortella inflexa. Fissidens lindigii (Hampe) Jaeg. (F. orrii (Lindb.) Braithw.) probably never grew out-of-doors in the British Isles.

A total of seventeen certain or possible introductions is very small in comparison with the large number of introduced angiosperms. This is no doubt mainly because very few foreign bryophytes are deliberately cultivated. Also relevant are the much wider geographical distribution of most bryophyte species, so that incoming propagules must often be those of native British species, and the fact that ports and docks, such a prolific source of alien angiosperms, are relatively inhospitable places for bryophytes and are rarely visited by bryologists.

At least seven of these seventeen species seem to have been introduced independently more than once - perhaps they are associated in their native haunts with favourite horticultural or other imports. Thirteen of them are dioecious and in no less than seven both male and female plants have been introduced; and these grow together except in Telaranea murphyae. Introduction is evidently not always by the single propagule. It is remarkable that seven of these species are found on the Isles of Scilly, five of them

being present on the island of Tresco. Planting shelter-belts and making fields and gardens on a barren island creates new ecological niches with no native plants to occupy them but available for colonisation by any bryophytes accidentally brought in when foreign vascular plants are imported.

Dr M.E. NEWTON (University of Manchester): "Sex chromosome evolution in bryophytes."

Sex chromosomes in bryophytes are of two types; (1) morphological, of which the X is larger than the Y and also possesses more heterochromatin, and (2) structural, which are seen to differ only in that the Y includes more heterochromatin that the X. In diploid dioecy, where a larger X than Y chromosome occurs, it is usually ascribed to differential erosion of parts of the Y as a result of an increasing genetic load and the absence of crossing-over during meiosis. Difficulties in applying the theory to haploid dioecy have led to the development of several new theories. That of Bull (1978) suggested preferential addition to the X. Like Blute's (1983) theory, however, it took no account of structural sex chromosomes. Smith's (1978) theory of Y chromosome deletion, however, while adequate for structural sex chromosomes, did not address the problem of morphological X chromosomes having more heterochromatin than the Y.

A theory to accommodate all known facts relating to bryophyte sex chromosomes (Newton, in press) was therefore put forward. It recognizes the possibility that dioecism may have arisen more than once, essential steps in the argument being that (1) a monoecious gametophyte must have the potential to initiate and develop male and female sex organs, (2) once dioecism arose, the developmental potential of the opposite sex could be seen as redundant and might be suppressed in the form of facultative heterochromatin, (3) there may be more secondary sexual characters associated with femaleness; more heterochromatin could therefore be expected to occur in the male-borne Y-chromosome than in the X, (4) these structural sex chromosomes would be expected to include equal amounts of achiasmate heterochromatin in the sporophyte generation, (5) accumulation of blocks of constitutive heterochromatin could be expected to protect sex-specific genetic information, of which there may be more in females than in males, (6) erosion of redundant facultative heterochromatin could be expected, there being more in males than in females, (7) the result would be morphological sex chromosomes.

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Dr E.W. JONES (Oxford) and **Dr A.J. HARRINGTON** (British Museum, Nat. Hist.): "African hepatics."

The coastal regions of West Africa from the Congo to Gambia are in the zone of high rainfall forest: mountains are few. In the forest hepatics are practically confined to tree boles, branches in the canopy, rotting wood, and the leaves of phanerogams and pteridophytes. Some of the species (e.g. Lophocolea spp., Riccardia spp., Aneura, Cephalozia spp.) will be readily

recognised by a temperate bryologist as belonging to familiar genera, but the dominant forms belong to genera which will be unfamiliar, with a great preponderance of Lejeuneaceae; out of 67 species collected in the Benin forests in 1947-8 47 were Lejeuneaceae. Species of Plagiochila belonging to sections of the genus characterised by terminal branching (absent from cool temperate climates) are also conspicuous. Further north and south in climates with a strong dry season is savanna, which has been unduly neglected by bryologists. Here the hepatic flora is indeed poorer than that of the forest zone, but the species are different; they include ephemerals of genera such as Riccia and Fossombronia which grow on the ground during the rainy season.

By contrast the East African lowlands are dry even on the coast, but there are numerous groups of often spectacular mountains arising abruptly out of the arid plains to misty heights where the boughs of forest trees are thickly clothed in Herberta spp., Plagiochila spp., Bazzania spp., and many Lejeuneaceae. Thus the East African hepatic flora is predominantly that of wet mountains whereas that of West Africa is prodominantly a flora of wet lowlands; this latter element is almost absent from East Africa.

Some readily recognised and characteristic species of these various floras were illustrated by slides (many of them provided by the British Museum) and also, in an exhibit, by specimens. The exhibit also showed some historic specimens from the British Museum, including those collected by Palisot de Beauvois in Nigeria in 1787-8, the first hepatics ever to be brought back from Africa.

Dr and Mrs H.L.K. WHITEHOUSE (University of Cambridge): "Stereoscopic photography of bryophytes."

Stereo-photography involves taking two photographs of the subject from slightly different viewpoints. This can be achieved either by using a two-lens camera, or by taking two photographs in succession with an ordinary single-lens camera and displacing the camera between the exposures. Photographs taken by both methods were shown. The displacement method has the disadvantage that any movement of the subject in the interval between making the two exposures becomes evident. On the other hand, standard stereo cameras available on the market have the lenses set at the average human eye separation, which results in distortion if the subject is closer than 2 m. Yet it is close-up stereo photography that is so rewarding and which is needed in any case for small objects such as bryophytes. The lens separation then needs to be one thirtieth of the distance of the subject. Thus, with a moss 15 cm from the lens, the camera needs to be moved laterally 5 mm before taking the second photograph. Many of the close-up photographs shown were taken with a home-made stereo camera with adjustable lens separation.

For showing stereo-photographs a twin-lens projector was used containing polarized filters and the audience wore spectacles with complementary filters. A metallic screen is necessary. A diverse range of bryophytes was shown, including views of the habitat of some species. Stereo-photography is valuable in enabling one to become familiar with the field appearance of the plants, both when wet and when dry. It also allows one to visualize how species compete: for example, Eurhynchium striatum, Brachythecium rutabulum and E. praelongum were seen in one photograph interwoven in a complex way on a woodland floor. In conclusion, a few stereo-photographs of bryologists were shown.

Dr K. POCOCK and Prof. J.G. DUCKETT (Queen Mary College, London) "The alternative mycorrhizas: fungi and hepatics."

By contrast to the lack of intimate relationships between mosses and microorganisms, endophytic fungi are widespread in hepatics. Light and

electron microscope studies have revealed these associations to be of three main types which almost certainly evolved independently in different groups of liverworts.

Basidiomycetous mycelia are invariably present in the stems and rhizoids in the majority of British members of the Jungermanniaceae and in other genera scattered through other families in the Jungermanniales (Marsupella, Saccogyna, Harpanthus, Southbya, Ptilidium). Amongst thalloid taxa this type of association is limited to the Aneuraceae and is highly developed only in Cryptothallus. The hyphae, with dolipore septa, but lacking clamp connections, form intracellular coils or pelotons within liverwort cells. Unlike the mycorrhizas of higher plants the fungus does not spread between the host cells (most likely a reflection of the absence of intercellular spaces in hepatics) but penetrates directly through the cell walls in the stems and extends into the substratum only via the rhizoids. Meristematic tissues, gemetangia and sporophytes remain free from fungus. The distribution of the fungus is characteristic of each species. In Southbya it is restricted to a strand of cells running down the centre of the stems but in Tritomaria and Lophozia the ventral side of the stems contain a mosaic of infected and uninfected cells. A notable feature of the last two genera is the production of papillae projecting into uninfected cells from the walls contiguous with those containing the fungus. These wall ingrowths consist of fungal hyphae surrounded by liverwort wall material. The hepatic-fungus interface is highly reminiscent of that in vascular plant mycorrhizas with both partners possessing a normal complement of organelles.

The fungi found in British Marchantiales (except Ricciaceae where they are absent), and in Fossombronia, Petalophyllum and Pellia (Metzgeriales) are closely similar to those forming vesicular arbuscular mycorrhizas in vascular plants. An intramatrical mycelium comprises large trunk hyphae which give off profusely branched arbuscules. The fungi possess the distinctive reticulate vacuolation found in Zygomycetes and many vacuoles containing polyphosphate granules.

In the third kind of association, found in the Lepidoziaceae, Calypogeiaceae, Cephaloziaceae and Mylia anomala, the fungus is largely restricted to the rhizoids. The hyphae in Calypogeia proliferate in the basal parts of the rhizoids whose adjacent stem cells possess numerous wall ingrowths each comprising a hypha overgrown by hepatic wall materials. In other genera the fungi form dense coils within swollen rhizoid apices. These are especially numerous on underground axes which extend to depths of up to 20 cm in peaty substrata.

Mr A.R. PERRY (National Museum of Wales): "Incursions into the North American bryoflora."

Remarks were mostly confined to a comparison of the mosses of the British Isles with those of New York State, more specifically the Adirondack Mountains. The history of bryophyte study and collection in the State goes back to about 1830, but the first published work did not appear until 1866 when C.H. Peck listed 274 mosses and 66 liverworts. Over one hundred years later, in 1980, E.H. Ketchledge published his Revised Checklist of the Mosses of New York State which includes about 500 taxa. No similar published checklist of hepatics of New York is known to exist though Schuster's The Hepaticae and Anthocerotae of North America, when completed, should provide one. A quick count in Ketchledge's List reveals about 180 species not recorded in the British Isles. Taking the moss flora of the British Isles as about 700 taxa these figures indicate that there are about 380 taxa in the British Isles not recorded in New York State.

There is, though, a considerable common element in their moss floras and a British bryologist visiting New York State for the first time will experience a certain amount of familiarity with its bryoflora. There are, however, some pitfalls for the incautious. For example the common Hypnum is not H. cupressiforme nor H. mammillatum but H. pallescens (Hedw.) P. Beauv., though the differences may be subtle; the common woodland Thuidium is not T. tamariscinum (which is not recorded) but T. delicatulum; Mnium hornum is present, but is essentially montane; there are two species of Climacium, C. dendroides and C. americanum Brid., the latter rather commoner; Paraleucobryum longifolium, seen recently in the British Isles only on Cairngorm, is common on acid rocks in lowland forest; Thamnobryum alopecurum is absent, being "replaced" by T. alleghaniense (C.M.) Nieuwl.; Pseudoleskeella nervosa, a very rare montane saxicole in Britain is frequent on tree bases and logs in lowland forest in New York State.

Several genera absent from the British Isles are represented. For example, Thelia, placed by Crum & Anderson in their magnificent Mosses of Eastern North America (Columbia University Press, 1981), in the Leskeaceae with, i.a., Anomodon and Pterigynandrum, is characterized by laminal cells with very long and often branched papillae and usually spinose to ciliate leaf margins. Its three species grow usually on tree bark where they form light- to glaucous-green creeping mats. Forsstroemia, represented in the area by F. trichomitria (Hedw.) Lindb., is probably related to Cryphaea and like it usually grows on tree bark, but it superficially resembles a Leucodon. Drummondia, named after the Scottish botanist Thomas Drummond, is represented by D. prorepens (Hedw.) E.G. Britt. It is a member of the Orthotrichaceae but has long creeping stems with ascending branches. A species that may occur in the British Isles is Anacamptodon splachnoides (Froel. ex Brid.) Brid., commonly called the "knothole moss" from its propensity for growing in often wet or water-filled knotholes on tree trunks, often on Fagus spp. Its gametophyte is nondescript and therefore easily overlooked, resembling a rather scruffy Amblystegium; but it is frequently fertile when its capsule offers distinct features for recognition. Another possible British species is Sphagnum pylaesii which in the northern part of its range is often submerged in shallow pools near sea-level, but farther south, as in the Adirondacks, is often in montane habitats on granite rocks wet by seepage but not submerged.

The Annual General Meeting was held afterwards (Minutes in Bulletin 46) and was succeeded in the evening by a conversazione, during which the demonstrations listed below were displayed. Throughout the whole of the meeting, Dr D.C. Lindsay rendered invaluable service as local secretary. That he did so with unfailing good humour is a matter for admiration, and the Society is greatly indebted to him.

Dr R. Alexander: Some bryophyte microhabitats in the Burren.
Mrs J. Appleyard, Dr M.O. Hill and Dr H.L.K. Whitehouse: Leptobarbula berica (De Not.) Schimp. in England.
Prof. E.G. Cutter: Scanning electron microscopy of bryophytes.
Mr R.J.Fisk: Reading Circle.
Dr S.W. Greene and Mr L.T. Ellis: B.B.S. bryohistorical project.
Miss J. Ide: Mosses with 8-year olds.
Dr E.W. Jones: African hepatics.
Dr M.E. Newton: Liverwort chromosome banding.
Dr M.C.F. Proctor: Scanning electron micrographs of peristomes.
Dr M.C.F. Proctor: Waxy cuticles on leaves of Polytrichaceae.
Mrs P.M. Whitehouse and Dr H.L.K. Whitehouse: Stereoscopic photographs of bryophytes.

M.E. NEWTON

After torrential rain on the day of the Paper-reading meeting, participants in the field excursion on Sunday were able to enjoy a day of fine weather. About 25 members gathered, and were guided by Mr Peter Thomson to sites in the Wyre Forest, an area which has been fairly thoroughly investigated for bryophytes. Most people spent the morning searching along the banks of the stream in Park Brook valley and saw: Frullania tamarisci, F. dilatata, Trichocolea tomentella, Pellia endiviifolia, Hypnum lindbergii, Ulota crispa, Amblystegium tenax and a patch of Ctenidium molluscum assigned to the "woodland taxon".

Members gradually emerged from the stream valley to have lunch beside the path of the old railway line, before a somewhat depleted party set off at a more rapid pace towards Dowles Brook and Lords Wood valleys. The excursion provided several members with an opportunity to return to old haunts: Drs Longton and Greene visited a site where 15 years before, sporophytes were produced by Pleurozium schreberi following the transplantation of male plants, finding no trace of either sporophytes or male plants, but Martha Newton was able to locate a fine colony of Bazzania trilobata on a well-remembered boulder beside the path to Dowles Brook. Additional species recorded in the afternoon included Cephaloziella divaricata, Saccogyna viticulosa and Plagiothecium undulatum, and the list was enhanced by a new Vice-county Record provided by Jean Paton who discovered Jamesoniella autumnalis on a Sorbus torminalis trunk in the valley below Lords Wood.

A. BURTON

HELP! BRYOPHYTE SYSTEMATICS

The librarian lent the BBS library copy of Bryophyte Systematics, edit. Clarke & Duckett, 1979, to a member during 1984 -- he thinks at a BBS meeting?? -- without making a firm note of who it was. Would whoever it was please let him know as soon as possible.
Dr K.J. Adams, 63 Wroths Path, Baldwins Hill, Loughton, Essex IG10 1SH

LIBRARY XEROXING

Several members have been taking undue advantage of the BBS Library xeroxing service, which is offered on a personal basis by the librarian, by asking for several hundred copies at a time. As the librarian has to make these copies himself and finds it very time consuming, in future there will be a limit of 50 copies per member (£5.00 worth).
Members do of course have the option of borrowing the items concerned and making copies for themselves. The service was started to save members the postage when they wanted just a few pages of information from a large book. Where copies of reprints in the library are required it would clearly be cheaper to post the actual item than produce a xerox copy at 10p per page.

QUESTIONNAIRE

If you have not already done so, please return the questionnaire you received with the last **Bulletin** - it only takes a few minutes to complete, and will provide the Society with useful information.

COUNCIL NEWSLETTER - NUMBER 1

At its meeting in Birmingham in September, 1984, BBS Council recommended that a Council Newsletter should be initiated as a regular feature of the Bulletin. Its function will be to report the more important discussions of Council and to draw attention to matters under consideration. It is hoped that these reports will encourage an active dialogue between Council and other members, who are encouraged to comment freely on any aspect of the Society's activities by writing to the General Secretary or a relevant officer. It is not planned to publish full Minutes of Council Meetings for reasons of economy, but Minutes are available to any member for examination on request. This first newsletter relates to the two Council Meetings held in 1984.

Finance

The Treasurer reported to the September meeting that the Society had made an operating profit of £2,403 in 1983. Despite uncertainty about printing costs of Journal of Bryology and other items, he was able to present a budget for 1985 based on assumed income at current subscription levels. The Membership Secretary drew attention to the position of a small number of active members in eastern bloc countries and elsewhere who find it impossible to pay their subscriptions because of foreign exchange controls and related restrictions. The possibility of such members being sponsored by UK members was raised, and a Council member offered to pay the subscription of the foreign member cited as an example by the Membership Secretary. Any member willing to sponsor an overseas bryologist in this way is invited to contact the Membership Secretary.

Journal of Bryology

Council has adopted a recommendation of the Editorial Board that plates in future issues of the Journal should be reproduced by offset litho, a process now employed my many comparable publications, and one giving acceptable results with most types of illustration. It is anticipated that this change will result in savings of about £80 per plate. Authors will have the option of having photographs reproduced by the traditional method at their own expense. It has been agreed that Vol. 4, part 4 should be reprinted as stocks are running low, and that the prices charged by the Society for back issues should be revised in line with those charged by Blackwells.

Series of drawings of bryophytes and portraits of distinguished bryologists are to become a feature of the Journal. Members with suggestions regarding suitable material should contact the series coordinators: for drawings, Dr S.R. Edwards, Manchester Museum, The University, Manchester, M13 9PL, and for portraits, Mr T. Blockeel, 20 Heathfield Close, Bingley, West Yorkshire, BD16 4EQ.

Proposal for a Computerized Bryological Bibliography

Council has agreed that the Society should explore with the International Association of Bryologists (IAB) the possibility of producing, through IAB, an international, computerized bryological bibliography to replace the lists at present being published independently in a number of journals, including Journal of Bryology. If a satisfactory system can be developed it should be possible to reduce printing costs and the time involved both in compiling and scanning the several current bibliographies, as well as providing the ease of access to the data base that computerization can bring. It is envisaged that any such international bibliography would be distributed to BBS members free of charge. Members with comments or suggestions concerning this initiative should contact the Treasurer.

Bryophyte Site Register Scheme

Council has agreed that the Society should collaborate with the Nature

Conservancy Council (NCC) in preparing a Bryophyte Site Register, which will list and grade sites of bryological importance, initially in England and eventually throughout Great Britain. An ad hoc committee, with Dr H.L.K. Whitehouse as Chairman, has been appointed to coordinate the Society's side of the work. As a pilot scheme, a register for two counties, possibly Cambridgeshire and Somerset, will be prepared during January-March, 1985 by a bryologist supported by a short-term contract from NCC. The register will be based on herbarium and literature data and records held by bryologists familiar with the areas concerned, supplemented by field studies where necessary. Subsequently, all members will be encouraged to contribute data to the broader national survey. Dr Whitehouse can be contacted at: Department of Applied Biology, Pembroke Street, Cambridge, CB2 3DX.

Publicity and Publications

Several activities have recently been initiated as a result of the open discussion on the future direction of the Society held at the Jubilee meeting in September, 1983 under the chairmanship of Dr S.W. Greene. The Publicity Officer has been particularly active in his attempts to stimulate a wider interest in Bryology, and a report on his work can be found in BBS Bulletin **44**, p. 12. An ad hoc Publications Committee has also been established with a view to facilitating the publication of bryological material aimed both at the committee bryo-freak and at the wider community. Among projects currently being pursued are a series of techniques handbooks, semi-popular field guides to bryophytes of particular habitats, and a coffee-table moss-book illustrated by colour photographs. Members interested in contributing to these or other bryological publications are urged to write to the Committee Chairman, Miss Jennifer Ide, Roehampton Institute, Whitelands College, West Hill, London SW15 3SN.

Matters under Consideration

A number of other initiatives are under discussion as a result of the Discussion at the Jubilee Meeting. Several concern meetings of the Society, and consideration is being given to holding a winter meeting at a Mediterranean location and special topics workshops on, for example, cytological techniques or bryophyte photography. The possibility of increasing the educational value of field meetings is being investigated.

It has been agreed to assess the degree of support that may exist for the formation of a Tropical Bryology group within the Society (see page 21), and to explore the possibility of preparing a reference herbarium of bryophyte specimens to be made available to members for a private study, perhaps on a long-term basis. Consideration has also been given to the appointment of a Projects Officer to stimulate and coordinate the development of research projects to be carried out by members either individually, or collectively. It was pointed out in discussion that several projects are now in progress, and that others, such as the preparation of biological floras of selected species, could profitably be undertaken. A counter view was also expressed, namely that the Society should continue to concentrate on mapping and other distributional studies, and that a Projects Officer is not needed. A decision was deferred and the views of members would be most welcome.

Resignation from Council

Mr G.G. Geyman (Membership Secretary) and Dr M.O. Hill (Recorder for Mosses) have indicated that they wish to resign from Council at the end of 1985 following many years of enthusiastic and efficient service. Nominations for replacements will be requested in the July 1985 Bulletin. Meanwhile, any member interested in taking on one of these jobs should contact the General Secretary.

R.E. LONGTON

FUTURE MEETINGS OF THE SOCIETY

SPRING FIELD MEETING, 1985, Chichester, West Sussex, 17 - 24 April.

Organizer & Local Secretary: Mr R.C. Stern, Botany Bay, Main Road, Fishbourne, Chichester, West Sussex, PO18 8AX.

Headquarters: Bishop Otter College.

Bookings: All bookings at the College should be made not later than January 31 through the local secretary, who will supply forms on request. The cost of full board is £14.00 (+ service charge and V.A.T.) per day, but has been broken down and itemized for the convenience of members attending for only part of the time.

Full details of the bryological diversity of West Sussex and of extra-curricular attractions in the area have been published in Bulletin 44.

SUMMER FIELD MEETING, 1985, Bavarian Alps, 28 July - 4 August.

Organizer and Local Secretary: Prof. Dr. R. Duell, Universität-Gesamthochschule Duisburg, FB6 (Botanik), Lotharstr. 1, D-4100 Duisburg, West Germany.

Accommodation: Hotel "Altwirt" in Lenggries, a small town, about 60 km south of Munich. All rooms are double rooms with bath/shower and toilet. Price per bed & breakfast about £8.00. This is the price for the winter-season now. A little change is possible but not probable. Cancellation 8 weeks before the beginning of the excursion.

Arrival: 28 July in Munich.

There is a train which leaves London Victoria Station on Saturday 27 July at 9.40 a.m.. It goes directly to Munich via Harwich and Hook of Holland (train no. D 317). Arrival in Munich Sunday 28 July at 6.53 a.m. The price at the moment is £128 return. This train does not run on Sundays.

It is much better to go by plane:

Departure: By Apex, from London Heathrow Airport, Sunday, 28 July at 9.25 a.m. (or 9.40 a.m.).

Arrival: Airport Munich-Riem, Sunday, 28 July at 12.05 p.m. (or 12.25 p.m.)

The price is £94 return.

You have to book and pay a fortnight before the leaving date for Apex flights. There are Super Pex flights available with different flight times. Super Pex flights have fewer restrictions than Pex flights and are more versatile but cost £142 return.

In Munich you will be picked up by private cars or a coach.

Clothes: for mountains you need mountain-shoes, warm and waterproof clothes.

**** For the reservation of rooms Prof. Duell needs to know by 15 March. Please ** contact Roy Perry (address below) who will kindly act as local secretary for ** the British bryologists.** He will collect the details and send them to Prof. Duell who will then make the necessary bookings. If you wish to buy one or more of the mentioned maps (see below) please let him know that too. The maps then will be reserved for you in Lenggries.

Address: A.R. Perry, Dept. of Botany, National Museum of Wales, Cardiff, CF1 3NP (tel. 0222-397951 ext. 267 (office): 0222-515531 (home)).

Proposed programme

28 July: arrival in Munich, transportation to Lenggries.

29 July: excursion to "Arzbachtal" near Arzbach and "Längental"; up to 1000 m high.

30 July: by cabin-lift from Lenggries up to the mountain "Brauneck". Alpine

tour to "Benediktenwand"; it is a climb from 1500 m to 1700 m. Downwards to Längentalalm and Arzbach. Alternative: climbing up from Lenggries to "Brauneck" and "Benediktenwand". Downwards by cabin-lift to Lenggries.

31 July: "Eibsee"-area east of Garmisch. In the afternoon "Partnachklamm" and "Ferchenbachtal" near Garmisch.

1 August: mountains "Kreuzeck" and "Hirschbichl" near Hammerbach which is near to Garmisch. Climbing up from 1700 m to about 2200 m. Up to the mountain "Kreuzeck" by lift, downwards on foot or by lift.

2 August: moorland near Ettal and/or Oberau. In the afternoon around Jachenau: "Reichenbach"-valley and/or "Grosses Lain"-valley.

3 August: Unterberg, north of Lenggries. Steinbachtal/Sonnersbachtal. Climbing up to 900 m.

4 August: In the morning eventually excursion in the "Isartal" near Lenggries: alluvions with many alpine plants.

Maps: L 8334, L 8532 and L 8530 topographical maps 1:50 000 are recommended. Price for each of them: 5,80 DM (about £1.50).

Some of the species recorded from the area are: Athalamia hyalina, Bazzania flaccida, Frullania jackii, Lophozia wenzelii, Peltolepis quadrata, Porella baueri, Sauteria alpina, Scapania apiculata, S. paludicola, Amblystegium subtile, Anoectangium sendtneranum, Anomodon rostratus, A. rugelii, Barbula bicolor, B. crocea, B. enderesii, Brotherella lorentziana, Bryoerythrophyllum alpigenum, B. rubrum, Callicladium haldanianum, Cyrtomnium hymenophylloides, Desmatodon latifolius, D. systylius, D. wilczekii, Geheebia gigantea, Entodon schleicheri, Homalothecium phillippeanum, Hypnum pallescens, Orthothecium chryseon, Paraleucobryum enerve, P. sauteri, Tayloria froelichiana and T. rudolfiana.

For determination of your collected bryophytes you can use FRAHM & FREY (1983), Moosflora: Stuttgart, Ulmer-Verlag; or in many cases SMITH, A.J.E., The Moss Flora of Britain and Ireland. A bryogeography of this area does not exist. The ecology of a big part of the bryoflora occurring in the alps is described in Duell, R. (1980), Moosflora des Rheinlandes, Decheniana-Beihefte 24, Bonn. The distribution of German mosses you can find in Duell, R. (1977), Die Verbreitung der deutschen Laubmoose, Bot. Jahrb. Syst. 98, 490-548. The distribution of liverworts is published in Duell, R. (1972), Vorläufige Übersicht zur Verbreitung der Lebermoose Deutschlands, Herzogia 2, 359-384.

ANNUAL GENERAL MEETING AND PAPER-READING MEETING, 1985, National Museum of Wales, Cardiff, 21 - 22 September.

Local Secretary: Mr A.R. Perry, Department of Botany, National Museum of Wales, Cardiff, CF1 3NP

Accommodation has been reserved in one of the University halls of residence, but the meeting itself will be held in the Museum in which the B.B.S. herbarium is housed. Full details of the programme will appear in the next Bulletin.

TAXONOMIC WORKSHOP, 1985, Gilbert White Museum, Selbourne, 2 - 3 November.

Local Secretary: Dr J.E. Chatfield, The Gilbert White Museum, "The Wakes", Selborne, Alton, Hants., GU34 3JH. (Tel. Selborne (042 050) 275, work; Alton (0420) 82214, home.)

At the invitation of its curator, Dr Chatfield, this meeting will be centred on the Museum. It is proposed to concentrate on the larger, common bryophytes of woodlands, with particular attention being given to the guidance of beginners. Mr A.C. Crundwell, Dr F. Rose and Mr R.C. Stern have kindly agreed to act as leaders and tutors. Full details of the programme and of accommodation and transport facilities in the vicinity can be obtained from the local secretary; please send a stamped, addressed envelope.

SPRING FIELD MEETING, 1986, Norfolk.
Local Secretary: Mr R. Stevenson, 111 Wootton Road, King's Lynn, PE30 4DJ. Mr Stevenson and Mr R.P. Libbey, who are kindly making arrangements for this meeting, will be pleased to supply full details, to be published in a future Bulletin.

SUMMER FIELD MEETING, 1986, West Scotland.
Local Secretaries: Mr D.G Long, Royal Botanic Garden, Edinburgh, EH3 5LR, and Mr G.P. Rothero, Benmore Centre, By Dunoon, Argyll, Scotland.
Lasting a fortnight in total, it is proposed that each week should be spent in a different centre. Fort William and the Isle of Mull are being considered for this purpose and it is hoped to provide further details in the next Bulletin.

ANNUAL GENERAL MEETING AND PAPER READING MEETING, 1986, Leeds University.
Local Secretary: Prof. D.J. Cove, Department of Genetics, University of Leeds, Leeds, LS2 9JT.
Full details of the programme will be available in a later Bulletin.

TAXONOMIC WORKSHOP, 1986.
It has been proposed that this might form the first BBS workshop to be devoted to bryological techniques; in this case, those used in bryophyte culture. If possible, it will be arranged at either Reading or Cambridge University. Details will appear in a future issue of the Bulletin.

OTHER BRYOLOGICAL MEETINGS, 1985–1987

13 - 20 March, 1985: Bryophytes. Mr Brian Brookes, Kindrogan Field Centre, Enochdhu, Blairgowrie, Perthshire, PH10 7PG.
The courses (for details of other course see below) at Kindrogan are run by our member Brian Brookes who is the Warden and both of them are suitable for beginners. He welcomes individual adults and small groups at Kindrogan, either to participate in advertised courses or on an assisted basis. The fee for each Bryophyte course is £103, which is inclusive of board, accommodation and all academic facilities. He would be pleased to provide copies of the full programme and further details of any 1985 courses on request. S.a.e. please.

4 - 10 July, 1985: Third International Congress of Systematic and Evolutionary Biology, University of Sussex, Brighton. Details are available in Bulletins 43 and 44.

5 - 10 August, 1985: I.A.B. Conference of Bryoecology, Vácrátót and Budapest, Hungary. Details are available in Bulletin 44.

9 - 16 August, 1985: Mosses and Liverworts. Dr M.E. Newton, Preston Montford Field Centre, Montford Bridge, Shrewsbury, SY14 1DX. Details from the Warden, Mr J.A. Bayley.

12 - 14 August, 1985: 4th Meeting of Central and East European Bryologists, Eger, Hungary. Details are available in Bulletins 43 and 44.

20 - 27 September, 1985: Bryophytes. Mr Brian Brookes, Kindrogan Field Centre; for details and full address see above.

July or August, 1987: I.A.B. Bryological Methods Workshop, Mainz, Germany. Details are available in Bulletin 44.

B.B.S. LIBRARY SALES AND SERVICE 1985

FOR LOAN:

Members wishing to borrow books or papers are advised to consider whether a xerox copy of the appropriate pages would suffice instead of the original in view of current postal rates. The current charge is 10p per exposure. Limit 50.

(a) Approximately 220 bryological books, journals and several thousand offprints of individual papers. A catalogue of the books and journals is available from the librarian, price £1.00.

(b) Transparency collection, list available (S.A.E.). 630 slides in the collection. Loan charge (to cover breakage) 50p plus return postage. Only 50 slides may be borrowed at a time to minimise possible loss or damage.

(c) Microscope stage-micrometer slide for calibration of eyepiece graticules. 10µm divisions. Loan deposit £15. (N.B. L201 microscopes no longer available due to slump in trade)

FOR SALE:

British Bryological Society Bulletins: Back numbers from No 23 @ 60p each.

Transactions of the British Bryological Society / Journal of Bryology:

Vol. 1	parts 1-5 (£2.40 each) £12	
Vol. 2	parts 1-4 (£3.00 each) £12	
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Vol. 7	parts 1-4 (£5.00 each) £20	renamed Journal of Bryology
Vol. 8	parts 1-4 (£5.00 each) £20	
Vol. 9	parts 1-4 (£5.00 each) £20	
Vol. 10	parts 1-4 (£8.00 each) £32	
Vol. 11	parts 1-4 (£10.00 each)£40	
Vol. 12	parts 1-4 (£11.50 each)£46	
Vol. 13	part 1 (£15.00)	(Revised prices 1984)

Census Catalogues:

Duncan,J.B.	Census Catalogue of British Mosses, 2nd edition	1926	(20p)
Sherrin,W.R.	Census Catalogue of British Sphagna.	1946	(20p)
Paton,J.A.	Census Catalogue of British Hepatics, 4th edition	1966	(20p)
Warburg,E.F.	Census Catalogue of British Mosses, 3rd edition	1963	(20p)

Corley,M.F.V. & Hill,M.O. Distribution of Bryophytes in the British Isles 1981
(A Census Catalogue of their Occurrence in Vice-counties)
Price incl. P. & P. Non-members (£6.00) Members (£5.00)

Other items:

Corley et al.	Mosses of Europe and the Azores. An Annotated List of Species, with Synonyms. Price including P. & P.	1981(£2.50)
Grolle,R.	Hepatics of Europe and the Azores. An Annotated List of Species, with Synonyms. Price including P. & P.	1983(£2.50)
Pearman,M.A.	A Short German-English Bryological Glossary.	1979(50p)

Swift x20 Handlens and Leather Case (Revised price 1985) (£8.00)
Idealteck No 3 Stainless Steel Forceps (£3.00)

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REFEREES (January, 1985)

Specimens sent to the referees should have a 4- or 6- figure grid reference in addition to the locality description. THEY SHOULD ALWAYS BE ACCOMPANIED BY A STAMPED, ADDRESSED ENVELOPE, EVEN IF MATERIAL IS SENT FROM UNIVERSITIES OR INSTITUTIONS. If anyone has difficulty in getting a specimen named they should send it to the appropriate Recorder - Mr Corley for hepatics or Mr Hill for mosses (addresses below).

The general referee will help beginners who are having difficulty in placing their material in a genus. The numbers refer to genera in Distribution of Bryophytes in the British Isles by M.F.V. Corley and M.O. Hill (1981).

GENERAL REFEREE: Mrs A.G. Side, 82 Poplicans Road, Cuxton, Rochester, Kent, ME2 1EJ

HEPATIC REFEREES:

1,2,15–17,38,53–55,64–67,69: D.G. Long, The Herbarium, Royal Botanic Garden, Edinburgh, EH3 5LR

3–10,13,14,18–24,36,37,39–44: T.L. Blockeel, 20 Heathfield Close, Bingley, W. Yorkshire, BD16 4EQ

11,12,58: Mrs J.A. Paton, Fair Rising, Wagg Lane, Probus, Truro, Cornwall, TR2 4JU

25–35,45–47,59–63: M.F.V. Corley, Pucketty Farm Cottage, Faringdon, Oxfordshire, SN7 8JP

48–52,78–86: M.J. Wigginton, Nature Conservancy Council, Northminster House, Peterborough, PE1 1UA

56,57,68,70–74: Prof. J.G. Duckett, Plant Biology & Microbiology, Queen Mary College, Mile End Road, London, E1 4NS

75–77: G. Bloom, 15 Tatham Road, Abingdon, Oxfordshire, OX14 1QB

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2–10,143: M.O. Hill (address above)

11–36: M.F.V. Corley (address above)

37,38,62–66: Dr A.J.E. Smith, School of Plant Biology, University College of North Wales, Bangor, Gwynedd, LL57 2UW

39,67–81,96–104,106–109,112–138: E.C. Wallace, 2 Strathearn Road, Sutton, Surrey, SM1 2RS

40–61: Dr D.F. Chamberlain, Department of Botany, Royal Botanic Garden, Edinburgh, EH3 5LR

82–90,105: Dr E.V. Watson, Little Court, Cleeve, Goring on Thames, Reading, Berkshire, RG8 ODG

91–95: Dr P.D. Coker, School of Biological Sciences, Thames Polytechnic, Wellington Street, London, SE18 6PF

110,111: M.J. Wigginton (address above)

139–142,144–175: Mrs J. Appleyard, Sunnyside, West Horrington, Wells, Somerset, BA5 3ED

READING CIRCLE

The Reading Circle circulates copies of the contents lists of the leading bryological journals. Any articles that are of interest may be requested, and a photocopy is supplied. For details of the scheme, and charges, please apply to the Reading Circle Secretary, Richard Fisk, 20 The Paddock, Tarporley, Cheshire (Tel.: (08293) 3405 (home); (0565) 54511 (office).

TROPICAL BRYOLOGY GROUP

The urgent need for an acceleration of studies on tropical bryology by workers in Europe, North America and Japan, arising from the imminent threat to the destruction of tropical forests combined with the dearth of specialists resident in the tropical countries, has been stressed repeatedly, for example in my contribution to the Proceedings of the BBS Diamond Jubilee Meeting. It is my view that the British Bryological Society has a moral obligation to attempt to stimulate studies of tropical bryology in this country. One approach would be to form a Tropical Bryology Group within the Society, and the purpose of this note is to assess the level of support that may exist for such an initiative.

The British Isles is clearly not the ideal location for studies of tropical bryology, but it is abundantly clear that bryologists working in the tropics will require the assistance of colleagues in temperate regions if the immense task of documenting the indigenous floras is to be accomplished before countless species are lost in the face of bulldozers and the woodsman's axe. Despite the problems of distance there is much that could be done here; we are well-endowed with herbaria rich in tropical specimens, and a number of British bryologists already specialize in tropical work, having established valuable contacts with tropical institutions and individuals.

The following are among the many advantages that could stem from the formation of a Tropical Bryology Group:

1. It would demonstrate a commitment on the part of the Society to assisting with the urgent task on hand.

2. It would provide a forum for the exchange of ideas, specimens, and information on travel opportunities and possible sources of funds.

3. It would open up opportunities for amateur members to engage in the study of tropical groups by facilitating the loan of specimens and specialist literature, and the establishment of valuable contacts in the international bryological community.

These are only a few of the functions that a Tropical Bryology Group could serve, and I would urge any members interested in seeing the formation of such a group to write to me at the Department of Botany, The University, Reading, RG6 2AS.

R.E. LONGTON

A complex of Three Philonotis Species from a Welsh Waterfall

In June, 1984, some material of Philonotis was collected from the vicinity of a waterfall at Tanygrisiau, near Blaenau Ffestiniog, Gwynedd (v.-c. 48) by Mr D.P. Field and forwarded to me for detailed examination. Lens and microscopic study of the material have revealed an intricate association of three species of Philonotis, P. fontana, P. caespitosa and P. arnellii. Furthermore, the surface of this complex was liberally sprinkled with detached propaguliferous branchlets of all three species. These were also studied microscopically.

I have not previously reported an intricate mixture of three Philonotis species. Previous to this, I have occasionally encountered complexes of P. fontana with P. caespitosa and P. caespitosa with P. arnellii. Prolonged culture experiments have supported the distinctness of the species involved in these previous finds.

J.H. FIELD

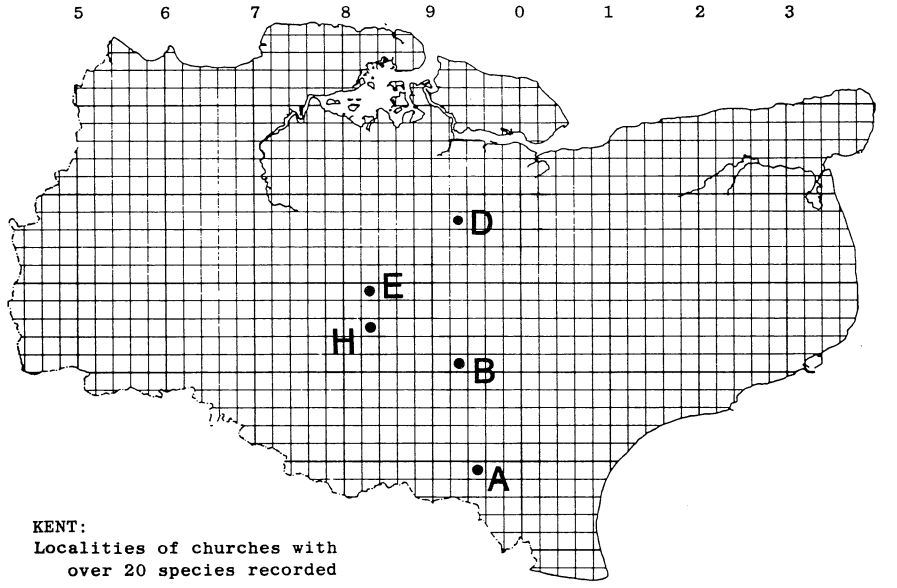
A NOTE ON THE BRYOPHYTES OF SOME CHURCHYARDS IN KENT

by A.G. Side

An interest in the bryophytes to be found on old church walls was fostered by the Wall Tours held annually by the British Lichen Society in conjunction with the Kent Field Club. These have been led by Jack Laundon and Frank Brightman, the latter choosing the walls to be visited. All the plants found on these chosen walls have been listed under the headings of Vascular Plants, Bryophytes and Lichens. It has been my pleasure to list the bryophytes on most of the Wall Tours. My interest was continued during a period of being unable to take long walks, for churches are easy of access, public, quiet and with seats available if necessary. They make ideal sites for bryophyte hunts.

In counting the species all man-made buildings are included in the term "wall". These are the churchyard wall, the tombstones, the steps leading to furnaces below ground-level and the drainage channel adjoining the church wall and running round the building. Care has been taken to include only species growing entirely on these man-made bases but it is well known that wind-blown dust can collect on wall tops and can stay there. Many lists have been made over the years, some surprisingly short, those in the drier regions near the north coast of Kent usually being shortest. Four sites on the estuary of the River Medway produced an average of only 5 species per site. The recent finding of 26 species in one churchyard has prompted the writing of this article and the ransacking of notebooks.

To bring some order into a short note just 24 lists have been taken and the species analysed. Three new vice-county records have been found in the hunt; Hygrohypnum luridum found by Mr E.C. Wallace in a drainage channel, watered by the rainfall from a church roof; Grimmia laevigata taken from a low church roof with the aid of a stick and Racomitrium aciculare in abundance on a flat, damp tombstone against a shady church wall and far from any mountain stream.



KENT:
Localities of churches with over 20 species recorded

The average number of species from the 24 sites is 15, the lowest having 5 and the highest 26. On the map are dotted 5 sites which have had more than 20 species each. They seem to have no apparent connection with each other in Kentish space. The most northerly one was sheltered with trees nearby, while the church with the highest number was exposed on high ground in the village in full sunshine when the count was made. The names of the species and varieties found on the 24 sites are given in alphabetical order below. They number 52, showing that even the church with 26 species had only half the potential number. The initial letters of the sites with more than 20 species have been entered in the list against the name of the bryophyte found there. A = Appledore; B = Bethersden; D = Doddington; E = East Sutton; H = Headcorn.

BRYOPHYTES FOUND IN A COUNT OF 24 KENTISH CHURCHYARD WALLS:

Amblystegium serpens A,B,D,E
Anomodon viticulosus E
Barbula convoluta A,D
B. cylindrica A,E
B. fallax B,D,H
B. recurvirostra H
B. revoluta
B. rigidula A,B,D
B. trifaria A,D,E,H
B. unguiculata B
B. vinealis D,E
Brachythecium rutabulum A,B,E,H
B. velutinum B
Bryum argenteum A,D,H
B. arg. var. lanatum B,D
B. bicolor
B. caespiticium A,B,E,H
B. capillare A,B,D,E,H
B. radiculosum D
Ceratodon purpureus A,B,D,H
Cirriphyllum crassinervium D,E,H
Dicranoweisia cirrata B,E,H
Dicranum scoparium
Encalypta streptocarpa
Eurhynchium praelongum A,B,E,H
E. swartzii
Funaria hygrometrica
Grimmia pulvinata A,B,D,E,H
Homalothecium lutescens B
H. sericeum A,B,D,E,H
Hypnum cupressiforme A,B,D,E,H
H. cup. var. lacunosum H
Neckera complanata E
Orthotrichum anomalum A,D,H
O. diaphanum A,B,D,E,H
Oxystegus sinuosus B,D,E,H
Pseudoscleropodium purum B
Racomitrium aciculare E
Rhynchostegiella tenella B,D
Rhynchostegium confertum A,B,D,E,H
R. murale B,D
Schistidium apocarpum B,E
Tortula intermedia A,B,D,E,H
T. latifolia H
T. muralis A,B,D,E,H
T. papillosa H
T. ruralis
Zygodon viridissimus A,B,D
Z. viri. var. stirtonii
Lophocolea cuspidata A
Lunularia cruciata E
Porella platyphylla D,E

It is unusual to find Pseudoscleropodium purum on a wall but it was there on top in full sunlight. Metzgeria furcata has been seen on a few old garden walls but on the whole walls in Kent are too dry for many liverworts. Lunularia cruciata is found in damp places near the base of the buildings. It was very pleasing to find it on one occasion with fertile archegonia some of which were persuaded to grow on at home to produce ripe capsules. Tortula papillosa has been found in five churchyards and T. latifolia in two. Leucodon sciuroides was found in two places not included in the list above. Zygodon viridissimus is often on walls, having recently been found in Kent as often on rock as on trees.

This note, written rather in retrospect and lacking somewhat in scientific content, may show to those amateurs who are looking for a purpose in their bryophyte hunts how interesting churchyard sites can be. There are many churches to visit. Botanists interested in vascular plants, too, often look to churchyards for species sheltered there. It is to be hoped that those whose duty it is to maintain the buildings will have a care for the plants also and that those who hunt for the plants will respect their right to sanctuary and will not collect them.

*B O O K S H E L F * B O O K S H E L F * B O O K S H E L F * B O O K S H E L F*

Bryologische Beitrage

Since 1982 a new bryological journal named "Bryologische Beitrage" has been published in Germany. The editor is Prof. Dr R. Duell, Duisburg (W-Germany). Editorial board: Prof. Dr J. Szweykowski, Poznan (Poland), Prof. Dr T. Pócs, Vácrátót (Hungary), Dr J. Váňa, Prague (Czechoslovakia). To date 4 volumes are available. Contents of these volumes:

Vol.1. : Original papers in German (with English summary) or English, plus literature list with abstracts.
Vol. 2 : Distribution of the European and Macaronesian Liverworts (Hepaticophytina) by R. Duell. In English.
Vol. 3 : Original papers as in vol. 1, plus literature list with abstracts.
Vol. 4 : Distribution of the European and Macaronesian Mosses (Bryophytina), part 1, by R. Duell. In English. (The first new list since Podpěra 1954.)
Vol. 5 : will be published during May 1985. Continuation of vol. 4.

Subscription-price: 25,-DM before publication
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Price per volume for non-subscribers:
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For members of the BBS:

If you wish to subscribe now you can get volumes 1 - 4 altogether for 100,-DM. If you wish to buy only e.g. vols. 2 and 4 you will get them for 30,-DM each. If you wish to subscribe or to buy single volumes, please write to: Roy Perry, National Museum of Wales, Cardiff, CF1 3NP, who is acting as British agent for Bryologische Beitrage. You will be able to pay him in £sterling (exchange rate in operation at that time) and thereby save hefty bank charges.

A German Bryophyte Flora

Those members hoping to attend the 1985 Summer Meeting in Bavaria may like to know that a new bryophyte flora of Germany is now available, and includes keys, descriptions and illustrations. Moosflora by J.-P. Frahm and W. Frey (1983, publ. Eugen Ulmer, Stuttgart), covers all the mosses and liverworts of Germany and neighbouring parts of central Europe, but excluding those restricted to the high Alps. Over 1000 taxa are covered.

The book is available by mail order from:
Mail Order Kaiser,
Postfach 40 12 09,
8000 München 40,
W. Germany
for a cost of DM 29 (about 4 DM to the £). They will mail the book with an invoice for the correct amount, including post and packing.

.....and one for West France

Another recent publication that may be of interest to European travellers is a key to bryophytes of the centre-west of France:

R.B. Pierrot (1982). Les Bryophytes du Centre-Ouest: classification, détermination, répartition.

Send your order to:
R.B. Pierrot, "Les Andryales", Saint-Andre, F17550 Dolus d'Oberlon, France, with a payment of FF 60 (about 11 FF to the £). Cheques should be made payable to : "Société Botanique du Centre-Ouest".

New publication

INDEX TO THE MOSS HERBARIUM OF WILLIAM STARLING SULLIVANT (1803-1873).

Geneva Sayre. 1984. Farlow Herbarium

William Starling Sullivant has been called "the father of American bryology". He worked or corresponded with the major figures in the 19th Century bryology in America and Europe. His herbarium is worldwide in scope, reflecting the travels of the many botanists and collectors who sent him specimens for determination or in exchange. The Sullivant collection came to Harvard via Asa Gray in 1874.

The Index covers the main Sullivant herbarium of approximately 10,800 specimen, including specimens from W.P.Schimper, Richard Spruce, J.D. Hooker, J.F.C. Montagne, C.F. Schwaegrichen, and Carl Mueller. It also includes Sullivant's exsiccata Musci Alleghanienses. Not covered in the Index are other exsiccata sets and several special collections, comprising another 8000 specimens and some Sullivant bibliographic types.

The Index is arranged alphabetically by species, with references to sheet number and genus. The publication is 8½ x 11", 117 pages. Price is $5 plus postage (.50 U.S., $1.00 elsewhere). Please make cheque payable to Farlow Herbarium, and mail to 20 Divinity Avenue, Cambridge, MA 02138, U.S.A.

Back copies of Buxbaumia

There are still some back copies available of Buxbaumia (1947-1969), together with the Index. The Index (covering all issues) costs Dfl 7.50 (surface mail, post and packing included). Those parts of the journal still available cost Dfl 4.60 each for members of the Dutch Bryological and Lichenological Working Group, or Dfl 10.60 for non-members (post and packing included). Xerox copies of non-available parts can be made at 7p per sheet, plus post and packing.

Contact: Fred Bos,
Bocholtsestraat 49,
7102 BT Winterswijk,
Netherlands.

Bryophytes of the Avon Gorge

Some years ago a provisional list of bryophytes that had been recorded in the Avon Gorge (v.-c.s 6 and 34) was prepared by the undersigned for a BBS meeting. A small number of copies of these (in which the two vice-counties are separately listed) is available on a first come-first served basis by sending a s.a.e. (17p stamp, long envelope) to:

Dr C.M. Lovatt, 2 Great Ostry, Shepton Mallet, Somerset, BA4 5TT

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ADDITIONS AND AMENDMENTS TO THE MAILING LIST

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REQUEST FOR LIVING MATERIAL

If anyone would be good enough to send me samples of any of the following liverwort species, I should be very grateful indeed. The material, for chromosome studies, is required from as many parts of the country and from as many different habitats as possible. It need not be fertile but should amount to enough to fill either the side of an horizontally placed pound jam jar or the base of a vertical one. This will, of course, depend on the size of individual plants. The former would be appropriate for species of Pellia, for instance, and the latter for such as Gymnocolea inflata. Packed in polythene bags, with habitat details and a six-figure grid reference, the specimens should reach me in good condition and I should be happy to refund postage. (Dr.M.E. Newton, Department of Botany, University of Manchester, Manchester, M13 9PL.)

Pellia endiviifolia
P. epiphylla
P. neesiana
Moerckia hibernica
Plagiochila asplenioides
(P. asplenioides var. major)
P. porelloides
(P. asplenioides)
Chiloscyphus pallescens
C. polyanthos
Frullania dilatata
F. tamarisci
Barbilophozia floerkei
Gymnocolea inflata
Ptilidium ciliare
Pleurozia purpurea
Odontoschisma denudatum
O. sphagni
Mylia anomala
M. taylorii

W.E. NICHOLSON

I am preparing a profile of the bryologist W.E. Nicholson (1866-1945) who lived for most of his life in Lewes, Sussex and who was a solicitor. His herbarium and diaries are kept at the Botany School, University of Cambridge but I am anxious to obtain:-

1. Copies of letters to or from him
2. Vignettes of his life
3. Details of herbaria in which there are substantial collections by him

I would appreciate hearing from members who can assist me.

Dr. Philip E. Stanley, 35 Luard Road, Cambridge, CB2 2PJ (Tel: 0223-210589)

BRYOPHYTE FLORA OF LEICESTERSHIRE

I would be most grateful to know of any BBS Member whom I have not yet contacted in this context, who would be interested in the compilation of a Bryophyte Flora of Leicestershire (less Rutland) on a tetrad basis. The similar Rutland Flora is approaching publication. The proposed Leicestershire Flora is a much greater undertaking and any help would be appreciated. Any records at all, old or new, rare or common, multiple or single, would be appreciated. Please contact me if you are interested.

Dr P.E. Jackson, Griffons, North Street, Stamford, Lincs. PE9 1AA

Edited by

A. R. Perry, Department of Botany, National Museum of Wales, Cardiff CF1 3NP, UK
