

# BRITISH BRYOLOGICAL SOCIETY

PRESIDENT: Dr M.O. HILL



## BULLETIN

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## SUBSCRIPTIONS

Subscriptions became due in 1 January. If you have not yet paid please do so as soon as possible to save the Society unnecessary expenses, by using the slip accompanying this Bulletin.

North American members paying in \$US (\$23 : \$12 : \$2) should remit directly to Professor Ronald Pursell, Department of Biology, Buckhout Laboratory, Pennsylvania State University, University Park, PA 12802, U.S.A. All others should pay the Membership Secretary at the address below. Members in EEC countries may pay by Eurocheques in £ sterling. Other foreign members should also pay in £ sterling by cheques drawn on a London bank, or by Giro (BBS Account No. 33 799 9805).

Please note that the Membership Secretary is now:

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## WARBURG MEMORIAL FUND

The British Bryological Society and the Botanical Society of the British Isles are able to offer small awards under the terms of the Warburg Memorial Fund. Whenever funds are available, the awards take the form of travel grants of up to £75 for botanists under the age of 25. Preference will be given to candidates who intend to undertake a project involving fieldwork in the British Isles or elsewhere.

Applications should include the following:

- 1) Curriculum vitae.
- 2) Brief details of the proposed project, with an estimate of costs, and information relating to the candidate's relevant experience and other qualifications.
- 3) Names and addresses of two referees.

Applications should be sent to Dr M.E. Newton, Department of Botany, William Brown Street, Liverpool, L3 8EN, and labelled "Confidential". Successful candidates will be expected to submit a report on completion of the study.

## PROCEEDINGS OF THE BRITISH BRYOLOGICAL SOCIETY

### SPRING FIELD MEETING, 1989, SALISBURY

Wiltshire is one of those counties that bryologists travel through. It contains no famous bryological localities; no new species have been described from its soil. Its moss flora has not been interesting enough to stimulate any of its native sons or daughters to study it in detail. Mention Wiltshire to the average British bryologist and he will immediately think of Salisbury Plain and conjure up a vision of rolling chalk grassland, chewed up by military vehicles and quite inaccessible to the civilian public. Nevertheless on the evening of 5 April a goodly gathering of BBS members assembled in Salisbury to see what they could find in South Wiltshire (vice-county 8).

On the morning of Thursday 6 April we had our first excursion, to Prescombe Down National Nature Reserve, an area of chalk grassland and scrub. To start with we wondered if we had been wise to come, for the ground was snow-covered. However, it was not very deep, we paddled through it and looked first at the scrub, where we found Cryphaea heteromalla, Bryum flaccidum, Metzgeria temperata, M. fruticulosa and Tortula papillosa. In the turf, which was almost clear of snow when we left, were Brachythecium glareosum, B. mildeanum, Dicranum bonjeanii, Neckera crispa, Fissidens cristatus, Weissia microstoma and Rhodobryum roseum.

In the afternoon we visited Little Langford Down, a Wiltshire Trust for Nature Conservation reserve, again consisting of chalk grassland with some scrub. The moss flora was rather similar to that of Prescombe Down but included Bryum pallens (or at least what passes for this on southern English chalk), Encalypta streptocarpa, Fissidens adianthoides, Seligeria paucifolia, Weissia longifolia and also Bryum torquescens, new to v.-c. 8, found by Nick Hodgetts. The surrounding Grovely Wood (Forestry Commission) proved disappointing. Lejeunea ulicina was plentiful there and Rhytidiadelphus triquetrus particularly abundant and luxuriant.

7 April was spent on the Upper Greensand. The morning visit was to Wardover Wood (Forestry Commission), which includes a large area of old semi-natural broad-leaved woodland with a rich bryophyte flora. The many epiphytes seen included Cryphaea heteromalla, Orthotrichum pulchellum, O. lyellii, Metzgeria fruticulosa, M. temperata and also a scrap of Ulota phyllantha on a poplar "new" to v.c. 8 though previously seen there but not collected by Rod Stern.

After lunch the party went on to Oysters Coppice (a Wiltshire Trust for Nature Conservation reserve). The Upper Greensand does not outcrop in the wood and the bryophyte flora is limited but species included Dichodontium pellucidum, Rhytidiadelphus loreus and the "woodland taxon" of Ctenidium molluscum. Racomitrium heterostichum, new to v.c. 8, was found on a nearby cottage roof by Howard Matcham. Gutch Common (SSSI) was within walking distance. Most of the species found there had been seen earlier in the day, but it had five species of Sphagnum including S. recurvum var. amblyphyllum, new to v.c. 8. Most members took the opportunity to pay a visit to Brachythecium appleyardiae in its only known Wiltshire site at Middle Coombe, where it was found to be flourishing and in fair quantity.

8 April was spent in the grounds of the Chemicals Defence Establishment at Porton Down. This straddles the Wiltshire-Hampshire boundary, and our field of study was the Hampshire portion, an SSSI and one of the last remaining areas of chalk grassland in southern England, visited by Francis Rose and Ted Wallace in 1974 but otherwise unknown bryologically. We were ably conducted by three local guides. Their main function, no doubt, was to see that we did not stray where we should not, but we found them helpful and informative. It was a warm

sunny day, by far the best of the week and the chalk grassland was most rewarding. New to North Hampshire were Pottia caespitosa and Bryum torquescens. Other species of interest were Aloina aloides, Brachythecium glareosum, Bryum pallens, Encalypta streptocarpa, E. vulgaris, Entodon orthocarpus, Phascum curvicolle, Pottia lanceolata, P. recta, Thuidium hystricosum, Tortella tortuosa, Trichostomum crispulum, Weissia longifolia and Leiocolea turbinata; but not Frullania tamarisci or Scapania aspera previously recorded by Rose and Wallace. At the end of the day we were taken to the excellent little Museum illustrating previous bryological work on the area and we came away impressed with its quality and very grateful for the warm welcome we had received.

9 April (Sunday) was a "free day" and splinter groups went off to different places. The main body spent the morning at Britford Water Meadows where the banks of the watercourses and the trees by them yielded Amblystegium varium, Cinclidotus mucronatus, Fissidens crassipes, Lesca polycarpa and Tortula latifolia, also Ulotta phyllantha on a willow, the second record for v.c 8. The afternoon was spent on the Clarendon Park Estate where George Bloom found Fissidens limbatus, and Dicranum montanum was abundant on a couple of logs. The day ended at Clarendon Palace where Ray Harding gave an interesting account of excavations there. This former royal palace is now just ruins among scrub. Porella platyphylla and Tortula marginata were abundant there. Also found on the chalk were Cirriphyllum crassinervium, Gyroweisia tenuis and Seligeria paucifolia.

On 10 April we went a few miles east of Salisbury to Blackmore Copse and Bentley Wood, two areas of mixed and broad-leaved woodland and plantations on Reading Beds and London Clay. Blackmore Copse produced the longest list, but without much of interest apart from Hylocomium brevirostre, Hypnum lindbergii and Polytrichum longisetum. From Bentley Wood we had also Brachythecium mildeanum, Cryphaea heteromalla, Dicranum bonjeanii and Orthotrichum lyellii.

On 11 April, the last day, a reduced party spent a morning of torrential rain in a bog and on wet heathland in the south-east of the county. On Landford Bog none of the ten previously recorded Sphagna were found. Among the hepatics were Cladopodiella fluitans, Riccardia latifrons, Kurzia paucifolia and (new to v.c 8) Cephaloziella elachista. Plaitford Common, now in Hampshire although within v.c 8, is part of the New Forest. It was difficult to do much there in the rain, but eight Sphagna were seen, also Hypnum imponens and fruiting Gymnocolea inflata.

It cleared up at lunch time and a very pleasant afternoon was spent on Whiteparish Common which was found to be quite rich bryologically, species seen there including Neckera pumila, Rhytidiadelphus loreus, Zygodon baumgartneri, Frullania tamarisci, Eurhynchium schleicheri and Ctenidium molluscum "woodland taxon".

Those of us who attended this meeting found the bryophyte flora of Wiltshire a little more interesting than we had expected. We are all most grateful to Vanessa Williams and Rod Stern for organising it extremely well and I must thank Rod Stern for supplying me with some of the information used in writing this account.



A.C. CRUNDWELL

## THE SUMMER FIELD MEETING, 1989, ABERYSTWYTH

The meeting was based at the Penbryn Hall of Residence of the University of Wales. Seventeen people attended the meeting for at least some of the time, varying from 14 on Saturday to 7 on the final day. We were pleased to welcome Theo and Marie-Yvonne Arts from Belgium on their first BBS meeting. All the localities mentioned below are in V.C. 46 unless stated.

On the first evening, as we walked through the college campus to examine our laboratory, Jean Paton pointed out Marchantia alpestris\* in cracks between paving stones. After this encouraging start the laboratory was found to be locked, and after a steep climb to the bar at the highest point of the campus, any hopes of a good chat about bryophytes were shattered by a loud jukebox. The misunderstanding over the laboratory was sorted out on later evenings, but the problem of finding a quiet drinking-place was never fully resolved.

**3 August.** The group assembled at Devil's Bridge to meet the Nature Conservancy Council warden Mr John Davies, who had kindly agreed to show us the 'easy way' into the oak-clad gorge of the River Rheidol. Lepidozia pearsonii was locally abundant on banks, and Plagiochila punctata and Mylia taylori were seen in small quantity. Other species seen in the woodland included Plagiochila spinulosa, Scapania gracilis, Trichocolea tomentella, Bazzania trilobata, Cephaloziella hampeana and Sphagnum girghensonii. Metzgeria leptoneura was found in a small wet ravine. The rocky outcrops proved to be basic in places, with Marchesinia mackaii, Amphidium mougeotii, Homalothecium sericeum, Neckera crispa and Tortella tortuosa. A brief misty rain was a welcome sight after such a hot dry summer. Sliding down a surprisingly damp scree to the river, some may have been grateful that this was not the 'difficult way' into the site. Lunch was eaten on level, well-illuminated rocks by the river. Jungermannia hyalina was abundant here, and Hygrobiella laxifolia was also detected on wet rocks. Old records for species such as Radula aquilegia and Lepidozia cupressina were not confirmed. It is probable that these were restricted to the less accessible and more humid areas of the gorge downstream, but the difficulties of thoroughly searching such a large area of woodland, and the value of having accurately localised records, were evident.

In the afternoon two people visited the accessible part of the Mynach river above the point where it plunges into a steep gorge to join the Rheidol. Cololejeunea calcareae\* was collected by Ray Woods on a vertical rock face where Neckera crispa was a conspicuous indicator of the presence of basic conditions.

The remainder of the group visited Cwmystwyth mine. Despite the extensive spoil heaps of this old lead mine, little of interest was found. Leptodontium flexifolium was recorded amongst thin grass, and Pohlia muyldermansii and Philonotis arnellii were found by the nearby river and roadside. Nearby, at the confluence of the Diluw and Ystwyth members reformed Bryum riparium. Large tufts of Atrichum crispum, a common species in upland Mid-Wales, occurred by the stream, and Plagiochila killarniensis\* was found by Jeff Bates on a slightly basic outcrop.

In the evening a very civilised bar was discovered, and Harold Whitehouse was able to show us his impressive stereoscopic photographs of bryophytes.

**4 August.** The north-facing corrie overlooking the small lake of Llyn Llygad Rheidol which lies at 510 m on Plynlimon, was visited on a warm clear day. Species found included Anthelia julacea, Mylia taylori, Gymnomitrium crenulatum, G. obtusum (in small quantity), Lophozia incisa, Rhabdoweisia crispata, R. crenulata and Andreaea alpina (including one very large patch). Rod Stern and Michael Fletcher recorded Plagiothecium denticulatum var. obtusifolium\* below a cliff overhang. Preissia quadrata and Rhizomnium

pseudopunctatum were recorded in flushes.

Later, several people went separately to the site of the old Eaglebrook copper mine. This is a valuable site for metal-tolerant lichens, but no bryophytes confined to metal-rich substrata were detected. Dicranella varia, Jungermannia gracillima and Weissia controversa were abundant on the spoil heaps; other species recorded at the site included Cephaloziella stellulifera\*, Gymnostomum aeruginosum\*, Bryum pallescens\*, Tetraplodon mnioides and Ditrichum lineare.

**5 August.** The shadeless expanse of the north-east bog of Cors Caron NNR (Tregaron Bog) was visited on a hot sunny day. The bog surface, old peat cuttings and a small area of sallow carr yielded Cephalozia macrostachya, C. loitlesbergeri\*, Kurzia trichoclados\*, K. sylvatica, K. pauciflora, Riccardia latifrons, Calypogeia sphagnicola and 11 taxa of Sphagnum, including S. recurvum var. tenue\*. The steep eroded silty banks of the Afon Teifi that flows through the bog had Fissidens curnovii, Pohlia annotina, P. campototrachela, Fossombronina wondraczekii and Atrichum tenellum\*. Some people seemed unimpressed by the latter, but this was the first Welsh record.

**6 August.** Sunday was left open as a free day. Most participants moved north in a group, stopping first to examine the dunes and slacks of Ynyslas NNR. Despite the existence of several interesting old records from this site, little of interest was found during the present visit. Rhynchostegium megapolitanum was the most notable species found. The group moved on to Esgairgeiliog one mile south of Corris (V.C. 47) where Rod Stern demonstrated a colony of Fissidens polyphyllus by a roadside streamlet. Further up the Afon Dulas at Aberllefenni (V.C. 47 and 48), Isoetecium holtii, Bazzania trilobata, Plagiochila spinulosa and Tritomaria exsectiformis\* (new to V.C. 47) were found in a sessile oakwood.

A very small contingent spent the day in Cwm Einion, searching the streamsides and fragments of sessile oakwood. Isoetecium holtii, Polytrichum alpinum, Bazzania trilobata, Jubula hutchinsiae, Lejeunea patens and Plagiochila spinulosa were recorded. Lepidozia pearsonii and Scapania umbrosa (on wood) were restricted to a small area on the south bank of the river, probably the same place referred to in previous records. Plagiochila atlantica was recorded on the north bank earlier this summer, but the small colony could not be refound, though doubtless still present.

Back at our base, the group was charmed to hear of the quaint local custom forbidding the public sale of alcohol on a Sunday (sadly discontinued as recently as November 1989). Luckily Peter Goodman was kind enough to sign us into the staff bar.

**7 August.** The north side of Cadair Idris (V.C. 48) was visited, primarily to examine the base-rich slopes near Llyn y Gafr. Species recorded included Anastrepta orcadensis, Bazzania tricenata, Grimmia torquata, Herbertus aduncus subsp. hutchinsiae, Encalypta ciliata, Eremonotus myriocarpus, Funaria obtusa, Hygrobiella laxifolia, Jungermannia sphaerocarpa, Leicolea bantriensis, Lejeunea patens, Lophozia sudetica, Marsupella sprucei, Plagiobryum zieri, Preissia quadrata, Pohlia cruda, Porella arboris-vitae and Scapania scandica. The perfect walking weather tempted some people to the summit, and Marsupella stableri was found above Llyn y Gadair.

**8 August.** Several sites were on offer for today, but people were attracted to the small bay at Cwmtudu near Newquay by the promise of swimming. In practice, only 3 people swam, while the remainder recorded Schistidium maritimum on seashore rocks, and Cephaloziella hampeana, Amblystegium fluviatile and Bartramia pomiformis on the roadside and streamside nearby. In the afternoon the wooded lowland valley of the Afon Arth was visited. Plagiochila

killarniensis\* and Marchesinia mackaii grew on a slightly basic outcrop, on wet rocks by the stream Jubula hutchinsiae, Jungermannia pumila, Amblystegium fluviatile, A. tenax, Cinclidotus fontinaloides, Porella pinnata and confusingly robust Fissidens pusillus were recorded. Basic flushes were marked by Cratoneuron commutatum and Pellia endiviifolia. Fissidens celticus was locally abundant on the banks of small side streams, and tubers were later found on material from this site by Theo Arts. Metzgeria fruticulosa\* was collected on elder.

During the week various people confirmed the continued presence of Coscinodon cribrus on shale outcrops on Constitution Hill in Aberystwyth, after some discussion about species of Grimmia.

Cardiganshire lacks the variety of geology and altitude to make it really exciting bryologically, and I was both disappointed and relieved that BBS expertise did not manage to shower me with too many rarities that I had overlooked. Many people contributed to what I hope was a successful meeting. The local help of Peter Goodman and John Savage was much appreciated. Members of the Nature Conservancy Council, particularly John Davies, gave invaluable help, and the owners of the sites we visited willingly gave permission for access. Participants bravely ate the Hall food with the minimum of complaint.

ALAN ORANGE

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#### AUTUMN ANNUAL GENERAL MEETING, 1989, LINCOLN

The hard work and unfailing organisation of the local secretary, Dr Mark Seaward, was rewarded by a well-attended and memorable meeting. The Society was accommodated in great style in the heart of Lincoln, one of the finest cathedral cities, in the comfortable and ancient Edward King Hall, only yards from the cathedral itself. The weather on both Saturday and Sunday was also remarkably pleasant, setting off the fine surroundings to best advantage.

The papers read on Saturday 23 September included three on the subject of 'bryology and bryologists of lowland England'. These were varied, including ecological, historical and distributional approaches. The other presentations ranged from the bryology of continental Antarctica and New Zealand to the ultrastructure of the bryophyte placenta and problems and progress in bryophyte conservation. The following are summaries of the papers presented, written by their authors.

Dr R.D. SEPPELT (Antarctic Division, Tasmania): "Taxonomy and Biology of Antarctic Mosses."

##### 1. Origins:

Most Antarctic bryophytes are thought to be post-glacial immigrants while many of the lichens, particularly endemic species, may have survived in Antarctica through the Pleistocene on high-altitude nunataks. There is a growing body of evidence from glacial geomorphological studies that ice-free refugia, some of which may now be submerged offshore, have persisted throughout the Quaternary period and may have been important centres for persistence and, later, dispersal of plants in Antarctica.

##### 2. Taxonomy:

The moss flora of continental Antarctica consists of relatively few widespread species. Most do not produce, or have not yet been found with, sporophytes. In the severe climate of Antarctica environmental modification can be extreme, compounding taxonomic difficulties in what are often

taxonomically difficult genera. Few genera have been reported from continental Antarctica. They include Bryum, Grimmia (including Schistidium), Ceratodon, Sarconeurum, Pottia, Bryoerythrophyllum and, perhaps doubtfully, Pohlia, Desmatodon and Plagiothecium. Recent recoveries from fumarolic areas include Tortula and Campylopus, and Dicranella has been discovered in some lakes.

Bryum and Grimmia are the most widespread and both present considerable taxonomic difficulties. A variety of methodologies, including field morphological comparisons, morphology of cultured material, biochemical analysis of enzyme systems, and cytological studies have been used to provide a rational basis for determination of Bryum species. Consequently, only two species - B. argenteum and the highly polymorphic B. pseudotriquetrum (found at a few localities with capsules) - are represented on continental Antarctica.

Grimmia and Schistidium are represented by a number of species but the taxonomy of all - both hair-pointed and non-hair-pointed species - needs careful revision. Continental species having hair-points include the endemic G. lawiana, G. trichophylla (with capsules) and possibly G. donniana and G. nordenskioldii (synonymised with G. immerso-leucophaea). A variety of species is found on the Antarctic peninsula but the taxonomy is anything but straightforward. Confusion exists between specimens identifiable as G. donniana and similar plants with leaves lacking a hair-point. Some fruiting material is clearly identifiable as Schistidium, some as Grimmia but just where Grimmia (Schistidium) antarctici fits into this confusion remains to be elucidated.

Several species of Ceratodon have been included in the Antarctic flora but the name now applied to most material is C. purpureus. There are, however, consistent morphological differences between Antarctic Ceratodon and Australian C. purpureus both in field populations and in culture experiments. No capsules have been found in Antarctic collections. There is some additional biochemical evidence, from enzyme analysis, to support possible separation of the Antarctic material from C. purpureus.

### 3. Photosynthetic Physiology:

Field and laboratory studies of photosynthetic physiology on Antarctic Grimmia, Ceratodon and Bryum have been recently carried out. The slow growth of Antarctic terrestrial plants is commonly attributed to the short summer growing season and low temperatures. Water stress and nutrient deficiencies are cited as additional factors. Long hours of summer daylight are frequently believed to compensate for the short growing season. The very bright light intensities commonly experienced at high latitudes have until recently only rarely been considered as stressful, despite the comparatively low light intensities required to produce maximum photosynthesis in mosses and lichens.

Observations of quantum yields, light saturated photosynthetic rates, and variable fluorescence of bryophytes suggested that photoinhibition was a major factor limiting productivity of Antarctic ecosystems.

A reduction in photosynthetic capacity in the presence of high light levels reflects damage to the photosynthetic apparatus caused by light in excess of that which can be used in the pathways of photosynthesis. The light intensity required to produce damage varies, depending on the light-harvesting capacity of the plant and the rate of photosynthetic pathway reactions that convert atmospheric carbon dioxide to carbohydrate. Circumstances which slow down these reactions, such as low temperature, drought stress and nutrient deficiencies, lower the level of light required for photosynthesis and, therefore, substantially increase the sensitivity to photoinhibition. These conditions are the norm in Antarctic ecosystems.



Photoinhibition has been observed at very low light levels using Grimmia antarctici. Maximum inhibition of photosynthesis by light was observed at  $500 \text{ E}\mu\text{m}^{-2} \text{ s}^{-1}$  (microEinsteins per meter squared per second), while half the maximum inhibition of the fluorescence ratio occurred at only  $100 \text{ E}\mu\text{m}^{-2} \text{ s}^{-1}$ . Above  $500 \text{ E}\mu\text{m}^{-2} \text{ s}^{-1}$  photosynthetic capacity is reduced by about 40%.

Studies carried out continually over a number of days indicated that photoinhibition is experienced daily throughout the summer growing season and must significantly reduce the potential growth of the moss.

Further experiments have indicated that photosynthesis in Grimmia antarctici is also limited by atmospheric carbon dioxide concentrations. The low rates of photosynthesis ( $22\text{--}29 \mu\text{mol CO}_2/\text{gm dry wt/hour}$ ) are typical for bryophytes at the normal atmospheric carbon dioxide concentrations of about 340 parts per million. By experimentally increasing carbon dioxide levels photosynthetic rates nearly three times higher have been observed. Maximum rates of oxygen evolution in G. antarctici were obtained at carbon dioxide levels ten times higher than present atmospheric levels.

Bryophytes are magnificent tools for physiological research. Perhaps one way to foster an awareness of bryophytes is by encouraging their use in this way, through applied research, rather than from the traditional taxonomic standpoint.

Dr R. LIGRONE (Institute of Botany, University of Naples): "The Evolution of the Placenta in Bryophyta."

The embryophytes are characterized by a distinctive life cycle in which the sporophyte develops within the gametophyte and depends on it for nutrition. This is a very transient condition in tracheophytes (pteridophytes and phanerogams), but persists for the duration of the life cycle in mosses, liverworts and anthocerotates. In these groups the sporophyte produces a basal organ, the foot or haustorium, that establishes a close morpho-functional relationship with the parental gametophyte.

Several studies have shown that, in all three major bryophyte groups, the sporophyte is able to carry on photosynthesis but needs organic nutrients supplied by the gametophyte for sustained growth (see Ligrone & Gambardella, 1988 for review). Moreover, despite the paucity of experimental evidence, it is widely maintained that the sporophyte does not absorb water and mineral ions effectively.

The site of nutrient translocation is the placenta, a specialized region that develops at the junction between the two generations. In general, the placenta consists of the epidermal cells of the foot, the adjoining cells of the gametophyte, and an intervening apoplastic space containing mucilage and cellular remnants of gametophytic origin. The cells of the placenta play an active role in the transport of nutrients towards the sporophyte, and generally exhibit a specialized structure that makes them clearly distinct from the adjoining parenchyma cells of the respective generation. For example, they have dense cytoplasm rich in ribosomes and mitochondria and an extensive endomembrane system. Most frequently, they exhibit protuberances of irregular shape forming a complex labyrinth on tangential walls. The wall labyrinth is closely outlined by the plasmalemma, which thus has a greatly amplified surface area. Cells with a wall labyrinth are widespread in embryophytes and are thought to be specialized in short distance transport of solutes from the apoplast to the symplast and vice versa. For this reason they have been called the "transfer cells". In higher embryophytes transfer cells have been found in many different tissues but are unknown in algae except around the zygote of Coleochaete (Graham & Wilcox, 1983). It may be that this cell type first

evolved in the placenta of primitive embryophytes associated with improved nutrition of the sporophyte.

The structure of the placenta varies significantly in the different bryophyte groups. These differences mainly concern the presence and distribution of transfer cells.

Within the mosses, transfer cells are restricted to the sporophytic side of the placenta in the Andreaeopsida and Polytrichidae, whereas they occur on both sides of the placenta in the Eubryidae and Buxbaumiidae, as well as in Tetraphis. Transfer cells are absent from the placenta of Sphagnum. Considering that transfer cells are of common occurrence in the placenta of other embryophyte groups (i.e. liverworts, anthocerot, pteridophytes, etc.), it would seem likely that the condition found in the Andreaeopsida and Polytrichidae is primitive, with the absence of transfer cells in Sphagnum being due to reduction. Starting from the primitive condition, a more advanced type of placenta might have evolved in the Eubryidae and Buxbaumiidae with the appearance of transfer cells in the gametophyte. The presence of an "advanced" type of placenta in Tetraphis indicates that this genus, often regarded as being "primitive", is more closely related to the Eubryidae-Buxbaumiidae clade than to the nematodontous group Polytrichidae, as also supported by studies of sperm ultrastructure (Duckett, Carothers & Miller, 1982).

In the liverworts the structure of the placenta appears to be far more diverse than in mosses. The Marchantiidae present transfer cells on both sides of the placenta, often arranged in several layers in the gametophyte. The only known exception is Riccia which lacks transfer cells. In the Metzgeriales Fossombronia has a placental structure very similar to that typical of Marchantiidae, whereas Pellia lacks transfer cells. In the Jungermanniales, two species have so far been examined; in both Marsupella funckii and Jungermannia gracillima, transfer cells are restricted to the sporophyte. Too few species of liverworts have been studied for any wide-ranging conclusions. However, it is interesting to note that the two jungermannialean species, belonging to a group that many authors consider to be primitive among liverworts, exhibit a placental structure similar to that suggested as primitive in mosses. This, if confirmed by further observations, may support the notion of a common ancestry for liverworts and mosses.

The placenta in the anthocerot is much more uniform than in mosses and liverworts. In all genera (Phaeoceros, Notothylas, Anthoceros, Folioceros, Megaceros and Dendroceros), transfer cells are present in the gametophyte only, whereas the sporophyte forms long and branched haustorial cells that penetrate the gametophyte tissue. As a consequence, the cells of the two generations are so closely intermingled that, with the partial exception of Anthoceros, they can hardly be distinguished with the light microscope. The placental spaces between cells of the two generations contain abundant protein crystals of gametophytic origin in Phaeoceros and Notothylas. This is indicative of a close relationship between these two genera, crystals being lacking or very rare in the other genera. Overall, the placental structure of the anthocerot appears to be quite distinct from that of mosses and liverworts, thus providing a strong additional criterion for separating the anthocerot from other bryophytes.

#### References

- Duckett, J.G., Carothers, A.B. & Miller, C.C.J. (1982). Comparative spermatology and bryophyte phylogeny. J. Hattori bot. Lab. 53, 107-125.
- Graham, L.E. & Wilcox, L.W. (1983). The occurrence and phylogenetic significance of putative transfer cells in the green alga Coleochaete. Am. J. Bot. 70, 113-120.

Ligrone, R. & Gambardella, R. (1988). The sporophyte-gametophyte junction in bryophytes. *Adv. Bryol.* 3, 225-274.

Mr N. HODGETTS (Nature Conservancy Council, Peterborough): "Progress and Problems in Bryophyte Conservation."

At the BBS Leeds meeting (1986) Peter Pitkin suggested that bryophytes were the poor relations in nature conservation and 6 measures could be taken to further their conservation. Many of his points are now being addressed:

1. Appointment of a lower plant ecologist in NCC. This has now taken place, though the continuation of the post is somewhat doubtful.
2. Establishment of criteria for selecting bryological SSSIs. Now being done.
3. Mentioning bryophytes in SSSI citations. Being encouraged.
4. Review of representation of bryophyte flora in SSSIs. Although many communities are well represented, those that are under-represented include Atlantic woodlands and ravines and highland communities.
5. Appreciation among bryologists for site-based records. This is improving.
6. Bryologists communicating site records to NCC. This still needs to be emphasised.

There remain many problems in addition to the well-known ones of pollution and habitat-destruction:

1. The "credibility barrier". Even among conservationists bryophytes are often ignored or not taken seriously, because of their small size, long Latin names and lack of common names. To overcome this it is necessary to explain the philosophy behind bryophyte conservation, and the international importance of the British flora. The former can be explained in terms of (a) the value of bryophytes in scientific research and education, (b) their potential use to man (e.g. alkaloid extracts, etc.), and (c) man's responsibility to protect them for heritage/aesthetic/spiritual reasons. Their international importance can be emphasised by noting that while only about 18% of the European Vascular flora is represented in Britain, the figure for bryophytes is about 70%.
2. Lack of survey information in many areas.
3. Lack of information on the practical conservation of bryophytes, and management of habitats for bryophytes.
4. Bryophytes of ephemeral habitats, or otherwise dull localities, are difficult to conserve using the existing available measures.
5. Collecting. Probably not so much of a problem as formerly, but still to be considered. Indiscriminate collection of Sphagnum for horticultural purposes is, however, a problem.
6. Climatic change. The onset of the greenhouse effect may have dramatic consequences for the British flora.

Additional ways in which bryophyte conservation is being furthered:

1. More surveys are being made, particularly in Scotland.
2. A BBS initiative for local recorders has been proposed.
3. Management advice is being given to NCC Regional staff, as well as SSSI selection/boundary advice.
4. The Red Data Book for cryptogams is well under way.
5. International initiatives, e.g. the European list of threatened species; bryological representation at IUCN; recognition of the international importance of British bryophytes.
6. The Bryophyte Atlas is well under way.
7. Species will be added to Schedule 8 of the Wildlife and Countryside Act in 1991.
8. Translocation trials for rarities is proposed.

9. Training of NCC staff in bryophyte recognition and in recognition of good habitats.

Dr J. BEEVER (DSIR, Auckland, New Zealand): "'Bryology down under' - Current Research in New Zealand."

New Zealand numbers amongst its three and a quarter million people seven members of the BBS, and in addition five institutions take the Journal of Bryology. Thus our links with the Society are strong.

The basis of modern knowledge of New Zealand bryophytes is a series of papers entitled 'Studies in the Bryology of New Zealand' published between 1913 and 1929 by H.N. Dixon, who worked on collections sent to him in England. Subsequently he corresponded extensively with G.O.K. Sainsbury, who produced in 1955 A Handbook of New Zealand Mosses which is still our moss bible today. More recently K.W. Allison and John Child produced a popular book on mosses, published in 1971, The Mosses of New Zealand, and a companion volume The Liverworts of New Zealand. The hepatics are much less well known than the mosses, the literature is widely scattered, and there is no equivalent to Sainsbury's Handbook. Prof Rudy Schuster and Dr John Engel have taken a keen interest in the New Zealand hepatics, and it is hoped that they may produce a Flora for this region. A new Moss Flora for New Zealand is being prepared by Dr Allan Fife at Botany Division of the Department of Scientific and Industrial Research. My own projects are:

1. Preparation of a revision of Allison & Child's Mosses of New Zealand. This is a more extensive treatment than the first edition. In addition to 75 spp. treated in detail, distinguishing features are given for a further 376 spp. A new key and drawings have been prepared, and colour photos are included.

2. Studies of mosses on the northern offshore islands of New Zealand. Many of the islands off the east coast of the northern part of the North Island are reserves, and some have areas of relatively undisturbed vegetation which makes them particularly valuable. Their climate is very mild. Several mosses of tropical affinity have recently been found on the offshore islands, e.g. Thuidium cymbifolium and Syrropodon armatus. Both are also known from a very few localities on the North Island mainland.

3. A revision of the genus Fissidens in New Zealand. There are approximately 20 species known in New Zealand, several of which may be undescribed. Fissidens oblongifolius Hook.f. & Wils. provides an example of the complexities to be unravelled. In this case three species, two of them previously unrecognized in New Zealand, have been confused.

4. Collaboration with Professor Zen Iwatsuki of Hiroshima University and Professor Janice Glime of Michigan Technological University in their world-wide study of bryophytes of thermal regions. Permanent quadrats set up on ejecta from a recent hydrothermal eruption have shown that the primary colonisers are mainly exotic vascular plants and cosmopolitan mosses.

Other bryological projects at present under way, or recently completed, include:

1. An account of Fossombronina species in New Zealand, and the description of a new genus in the Calobryales, Stéereomitrium, by Dr Ella Campbell of Massey University.

2. A taxonomic revision of the genus Camptochaete (Lembophyllaceae), by Ray Tangney, as a PhD study at the University of Otago.

3. A revision of the genus Riccardia in New Zealand, by Elizabeth Brown. Her PhD thesis, supervised by Dr John Braggins at the University of Auckland, is to be published this year in the Journal of the Hattori Botanical Laboratory.

4. A revision of the genus Hookeria in New Zealand, by Dr Allan Fife.

DR J.M. LOCKE (Milton, Cambridge): "Calcifuge Bryophytes at Wicken Fen - normal succession or temporary aberration?".

Wicken Fen Nature Reserve is one of the earliest sites acquired by the National Trust; the first portion was donated in 1899. It is an undrained, but not undisturbed, relic of the original fenland, and supports a complex of open water, reed beds, sedge fields (cut every four years), litter fields (cut annually) and carr (scrub dominated by Frangula alnus). Most of the carr developed after the National Trust took over the Fen. Habitat diversity is maintained by cutting and other management, and the Fen has recently become wetter as a result of the sealing of the northern bank.

The earliest moss records are those of Richards (1930) who recorded 17 mosses and 3 liverworts. Proctor (1956), in his bryophyte flora of Cambridgeshire, remarked on the general poverty of the flora, pointing out that it was more typical of wet meadow and woodland than of the Norfolk valley fens. He made no mention of any calcifuge species.

In 1963 Sphagnum fimbriatum, Polytrichum commune, Hookeria lucens and Tetraphis pellucida were found, and in subsequent years many more calcifuge species were added to the list, so that of the 89 mosses and 18 hepatics now known, about 35 can be regarded as calcifuge. Species such as Campylopus brevipilus, Plagiothecium undulatum, Rhytidiadelphus loreus and Hylocomium brevisrostre have been found. In the 1980s the area occupied by calcifuge bryophytes has declined and some species have not been seen recently (Hookeria - last record 1975; Leucobryum glaucum - 1979; Sphagnum recurvum - 1975; Plagiothecium undulatum - 1975).

Calcifuges occur within the carr on dead Molinia tussocks, and on the ridges left by peat digging, both sites of local leaching. In places they also occur on the general surface of the peat beneath the carr. They have presumably arrived by wind dispersal of spores or fragments. The recent decline can be attributed to high winter water tables and, more especially, to increased competition from higher plants, particularly Calamagrostis, following the death of much of the Frangula canopy following a fungal infection, probably identical to an outbreak in the late 1920s. In the long term the shrub canopy will re-establish and bryophytes may then become more widespread again.

#### References

- Richards, P.W. (1930). The Bryophyta of Wicken Fen. In: J.S. Gardiner (ed), The Natural History of Wicken Fen.
- Proctor, M.C.F. (1956). A bryophyte flora of Cambridgeshire. Trans. Brit. Bryol. Soc. 3, 1-49.

#### Discussion:

Dr Jones wondered if the failure of earlier collectors to find calcifuge bryophytes was due to the parts of the Fen where they grow being closed to visitors in the 1930's. He also pointed out that Hylocomium brevisrostre, although a western woodland species, was not a calcifuge. Dr Lock replied that calcifuges had first been found in an area quite close to the Fen entrance, and in other areas which had always been open.

Mr Perry suggested that Scandinavia was a more likely source of spores than western Britain, as some of the species concerned fruited much more frequently there. Dr Hill suggested that fragments, rather than spores, were a more likely mode of spread for many species. In response to a query from Dr Lock, it was said that extremely small moss fragments are capable of giving rise to new plants, and that in Japan mosses are introduced to new sites by grinding plants in a domestic blender and spreading the resulting suspension.

Dr M.R.D. SEAWARD (University of Bradford): "Lincolnshire Bryology and Bryologists."

Historical research into bryology of Lincolnshire reveals that although many leading botanists of the day visited the county, their bryological contribution was minimal. The work of F.A. Lees was the exception: his discoveries, mainly in the Market Rasen area, during his residence there from 1877 to 1879, give a clear indication of the once rich bryophyte flora, much of which had declined by the end of the 19th century, mainly as a result of extensive land drainage and other agricultural practices. The work of G.H. Allison during the 1930s deserves special mention; many of his discoveries, particularly the rare Bryum spp. on the N.E. Lincolnshire coast, have not been found since. From 1959 onwards, M.R.D. Seaward and many other bryologists making short-term visits to the county have regularly added VC records and, more recently, re-discovered several rarities not seen for 50 or more years. The Lincolnshire bryophyte flora can currently be summarized as follows: of the 388 taxa recorded, 265 (223 mosses, 42 hepatics) are known to be extant, 97 have not been seen for 50+ years and 13 have not been seen for 100+ years, 8 possibly occur but are not supported by herbarium material, and 5 are doubtful in the absence of herbarium material. An overview of Lincolnshire bryophyte habitats past and present was provided and lines of enquiry likely to prove fruitful suggested.

Dr K.J. ADAMS (Polytechnic of East London): "Proposals for a 5 km<sup>2</sup> Mapping scheme for Eastern England".

Publication of the three volumes of the Bryophyte Atlas should serve as a stimulus to further recording as the patterns of blank squares are revealed, but because recorders are unlikely to see their post-Atlas records appear on updated maps in published form for a long time to come, some other carrot is needed to ensure that mapping of distribution patterns is continued.

The importance of detailed mapping on a regional basis is being spectacularly underlined by the rapid recovery of SO<sub>2</sub>-sensitive bryophytes and lichens in London and eastern England as SO<sub>2</sub> levels decline. In south-west Essex species such as Rhytidiadelphus loreus, R. triquetrus, Hylocomium splendens, Bartramia pomiformis, Tortula intermedia and Tortula ruralis, in addition to the more familiar sensitive epiphytes such as Cryphaea, the Ulotas, Frullanias and Orthotricha (other than O. diaphanum), had been wiped out by 1950, reappearing further out in concentric zones centred on London, depending on their sensitivity to this deadly gas.

Despite a continued rise in nitrogen oxide and ozone levels certain bryophytes are making a remarkable comeback. On Hampstead Heath the author has found Orthotrichum striatum bristling with capsules on one Crack Willow, Ulotia bruchii on three willows, again in fruit, and 4cm wide patches of Frullania dilatata on two others. The presence of lichens such as Usnea inflata and Parmelia perlata tell the same story. Bryophytes and lichens would appear to be far more sensitive to SO<sub>2</sub> than other pollutants in the south of England. Monitoring the recovery will be particularly interesting, as rather than a sequential reversal of the pattern of extinction, the species reappearing are those most effective at inoculating the now 'safe' substrates with their propagules, irrespective of their degree of sensitivity to SO<sub>2</sub>. To pick up

such rapid distribution changes, detailed base-line surveys are required on a regional basis. The bryophyte SO<sub>2</sub> zones for example can only be adequately defined by mapping out from central London in a wide arc to the Norfolk coast.

A few counties have been or are being mapped on a 5 km<sup>2</sup>, or 2 km<sup>2</sup> and even a 1 km<sup>2</sup> basis, but bryologists are so thin on the ground that only a few counties are likely to be mapped in this detail for the foreseeable future, and adequate coverage on a tetrad or monad basis is likely to be impossible except in a small county such as Rutland. Furthermore individuals vary somewhat in their success in locating all the species in their area; some for example tend to avoid arable field species with rhizoidal gemmae, others those of urban habitats. Marchantia alpestris and Bryum gemmiferum for example are common pavement gap species in London, and Trichostomopsis has been found growing as a 'turf' on soil between the paving slabs of a station platform, whereas most people would only look for it at the base of a wall. Similarly Tortula brevis is generally found on river banks or at least not far from water, but acting on a suggestion by Harold Whitehouse that it might be spread around by badgers, the author succeeded in locating it on fresh spoil, outside a badger hole, half way up a cliff in Grays Chalk Quarry. What better proof than that!

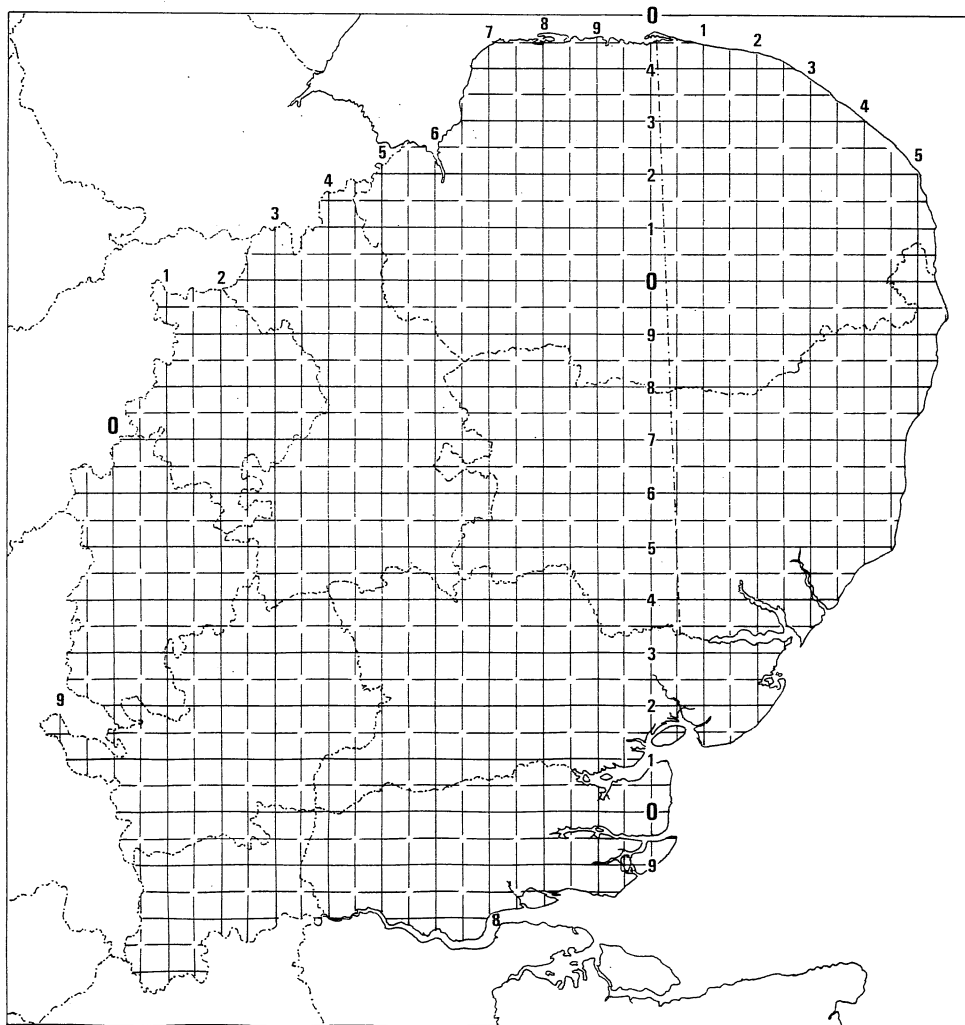


*Tortula brevis*

( in cultivation ! )

Thus apart from the obvious advantages of reasonably detailed mapping on a regional basis the whole exercise can be made that much more enjoyable and informative by passing on the snippets of information gleaned from one county to recorders in adjoining counties. In Essex for example, Cricket Bat Willows form an ideal substrate for epiphytic lichens and bryophytes, and since they grow to maturity in about 14 years can be used to detect recent colonists.

To show up distribution patterns on a regional as opposed to a national basis



Map of the vice-counties of south-eastern England  
with a 5km<sup>2</sup> grid (see p.17)



the 10 km<sup>2</sup> is too coarse a grid. A tetrad or monad would be ideal but probably impractical. The accompanying map of the vice-counties of eastern England with a 5 km<sup>2</sup> grid superimposed however, suggests a suitable compromise.

Species check-lists for Vice-counties 18-21 and 25-31 have been prepared, a compendium of vice-county records is being compiled on disc, and a set of provisional maps is being produced for circulation to interested participants. Several BBS members are already collecting data for county floras within the region. A 10 km square Atlas of the Bryophytes and Lichens of Essex is in the final stages of preparation for example. This will include maps of more interesting species on a 1 km<sup>2</sup> basis; and the data collection for a later 5 km<sup>2</sup> Atlas of bryophytes is well advanced.

The proposed 5 km<sup>2</sup> Atlas of Bryophytes of Eastern England is not intended to take the place of such county Floras. By co-operating, bryologists working on vice-counties in the region can, however, produce a more even coverage of the area, concentrate on more detailed investigation of pollution-sensitive species, and tackle some of the adjoining areas which are not currently being mapped. It is proposed that a working party be set up to co-ordinate mapping in Vice-counties 18-21 and 25-31 in March 1990. Anyone interested in participating in the scheme is invited to contact Ken Adams on 01 508 7863 for a copy of the check list and further details.

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After the Annual General Meeting the evening continued with a book sale - becoming rather a tradition during the autumn meetings - with Mark Seaward as auctioneer. As is customary, a conversazione followed with several notable exhibits.

PHILIP LIGHTOWLERS

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FIELD MEETING, LINCOLNSHIRE, 24 SEPTEMBER, 1989

Sunday was devoted to fieldwork, most of those attending the Saturday functions staying on for the morning visit to Swanholme Lakes (43/9468), a complex of flooded sand and gravel pits within the SW boundary of Lincoln. The site was notified as an SSSI in October 1985, only ten weeks after coming to the attention of the NCC through a routine consultation on a planning application for housing, hotel and leisure facilities. Not surprisingly, the NCC objected to the proposed development (see Urban Wildlife News 6(3): 1, 1989): as well as an interesting fauna and aquatic plants such as Littorella uniflora, Pilularia globulifera, Stratiotes aloides and Callitriche hermaphroditica, the site supports a locally important bryophyte flora, particularly in respect of Sphagna and other acidic wetland species. Of 80 bryophyte taxa recorded from grid square 43/96 over the past 30 years, more than 60 were observed on this occasion, together with 13 new ones, including Dicranella rufescens, Sphagnum auriculatum var. auriculatum, Aneura pinguis, Pellia neesiana, Riccardia cf. incurvata and R. chamaedryfolia. It is hoped that this area can be properly managed and protected to safeguard its wildlife.

In the afternoon, localities to the south of Lincoln were visited, including Ancaster churchyard (43/983435), site of Armeria maritima ssp. elongata (see Watsonia 4, 125 & 136, 1958), but the bryophyte flora here, and at the neighbouring Ancaster Valley (43/9842), proved disappointing, particularly when compared with the species lists compiled by G.H. Allison hereabouts in the 1930s. The current poor bryophyte flora in Ancaster Valley is almost certainly the result of poor grazing management.

The number of BBS members had by now dwindled, the few stalwarts remaining moving on to Rauceby Warren (53/034439), a calcareous heathland over sand and clay with a limited but interesting bryophyte flora of about 44 taxa, including Riccia cavernosa, Pottia starkeana ssp. minutula and Physcomitrella patens, and unusually Fontinalis antipyretica surviving here as a plant of seasonal ponds.

Several BBS members furnished useful bryophyte lists from other Lincolnshire sites they visited on their homeward-bound journeys, for which I am most appreciative. I am also grateful to the Lincolnshire & South Humberside Trust for Nature Conservation for permission to visit their nature reserves at Ancaster and Rauceby, and to the numerous members of the BBS, NCC and Lincolnshire Naturalists' Union who actively participated to make this an enjoyable conclusion to an eventful weekend.

MARK R.D. SEAWARD

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#### THE BRYOPHYTE WORKSHOP, 1989, LONDON

The workshop was intended to cater particularly for the needs of beginners and attracted 14 participants, 7 of whom were members of the Society.

On Friday evening there was a session on basic bryology for those who felt they needed it. Saturday and Sunday each began with an expedition to Wimbledon Common to collect specimens, which participants identified using microscopes and equipment kindly made available by Whitelands College. No rarities were found, but a useful list of 28 mosses and 6 hepatics is being sent to the Common Conservators. Polaroid spectacles were donned to view some exciting 3-D colour slides of bryophytes, most kindly presented to Dr Harold Whitehouse.

The advice and help given during the weekend will make a real contribution to many attendees' identification skills. Of particular value, at least for me, were the practical hints and tips on dissection and slide preparation, whilst the clarification of difficult points in the keys may help to reduce future frustration.

The success of the workshop owed much to the presence of Drs Alan Eddy and Philip Lightowlers, who gave generously of their time and expertise; and especially to Jennifer Ide whose organisation was ideal. Finally, the contacts made during the Workshop will help to assuage the 'loneliness of the long-distance bryologist' which afflicts most amateurs who take up the art.

ROY HURR

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#### FUTURE MEETINGS OF THE SOCIETY

##### SPRING FIELD MEETING, 1990, Morecambe, 4-11 April

Local Secretary: Mr Martin Wigginton, Nature Conservancy Council, 70  
Castlegate, Grantham, Lincolnshire, NG31 6SH. Tel. 0476 68431.

Headquarters: Belle Vue Hotel, 330-2 Marine Road Central, Morecambe. Tel.  
0524 411375. Reduced rates available of £90 for the week (£105 en suite),  
full board.

Accommodation has been reserved at the Belle Vue Hotel, and booking should be made through the local secretary. Participants are advised to book as early as possible. Full details of the programme, and of alternative accommodation in the area, are available from the local secretary, who would much appreciate an early indication of your intention to attend this meeting.

The programme has been designed to cover as many habitats as possible, ranging from lowland limestone and ravine woodland to upland moors and valleys. We will concentrate mainly on West Lancashire, with forays into neighbouring vice counties and endeavour to find species not recorded in the area since early this century, but probably still there.

Laboratory space will be available at the HQ hotel for those wishing to bring microscopes.

SUMMER FIELD MEETING, 1990, Ulster, 1-15 August

Local Secretary: Dr Keith Lewis, Biomedical Library, Queen's University, Belfast City Hospital, Belfast BT9 7AB. Tel. 0232 329241.

Headquarters: 1-6 August: Londonderry Arms, Carnlough, County Antrim. Tel. 0574 85255.

6-9 August: (Castlerock) not yet finalised.

9-15 August: (Dunfanaghy) not yet finalised.

The meeting will concentrate on the province of Ulster, beginning by spending the first few days in Carnlough in the heart of the glens, then moving to the Castlerock/Limavady area in County Derry for the remainder of the first week. It is proposed to visit the Garron Plateau, Glen Arriff, Magilligans Strand and several other interesting and under-recorded sites.

For the second week the meeting will move to Dunfanaghy in North Donegal. Sites to be visited include Glenveigh, the mountains of Aghlamor and Aghlabeg, the Derriveigh Mountains and a range of coastal habitats.

Please contact Keith Lewis for further details of the programme, travel and accommodation as soon as possible.

ANNUAL GENERAL MEETING AND PAPER-READING MEETING, 1990, Cambridge, 21-23 September.

Local Secretary: Dr Phil Stanley, 48 Glisson Road, Cambridge, CB1 2HF. Tel. 0223 460888.

This will be a special meeting in honour of Professor Paul Richards and Dr Eustace Jones, two of our most longstanding active members. Accommodation and meals will be in Downing College and lectures and the AGM will be held in the nearby University Pathology department.

The meeting will follow the conventional pattern of a symposium on the Saturday followed by the AGM, and a field meeting on the Sunday. As usual, there will be a Council Meeting on the Friday evening, while on Saturday there will be a special symposium session on Tropical Bryology and in the evening a celebratory meal to mark the occasion.

BRYOPHYTE PHOTOGRAPHY WORKSHOP, 1990, University of Manchester. Evening of 9 November, and full days 10-11 November.

Local Secretary: Dr Sean R. Edwards, Manchester Museum, Manchester University, Oxford Road, Manchester M13 9PL. Tutors: Dr Harold Whitehouse, Dr Michael Proctor, and Dr Edwards.

The main purpose of this workshop is to instruct members on the best ways of using their own equipment to record bryophytes photographically. Stress will naturally fall on using the camera to record or collect bryophytes, although we shall also try to make the results attractive. We will show what can be done with the most basic of equipment, through to the advantages (if any) of spending a king's ransom.

Basic requirements consist of a single-lens reflex camera with manual control and some means of focussing close-up, preferably to life-size or more; extension tubes and a standard lens are quite sufficient, although an electronic flashgun and some means of using it off the camera would be most useful. If any prospective participants are unsure of what might be required, please contact the local secretary ('phone: 061-275-2671 weekdays; 061-442-9346 evenings) or Dr Proctor (036-37-468 evenings) in advance, rather than buy unwisely or turn up with some vital piece of equipment missing.

Provisional programme: Friday evening - introductory session for those who can make it; Saturday - close-up, macro and microscope photography; Sunday - field day (weather permitting). We are also most privileged to be able to present the unique experience of Dr Whitehouse's spectacular stereoscopic bryophyte photography, both as a slide show and as demonstrations with a stereo viewer. He will talk on taking stereophotographs with a simple home-made jig, as well as with his latest "Baby Bertha IV" made by his late wife Pat.

This workshop is likely to be popular and numbers must be limited, so please do not leave it too late to book. Write to the local secretary for further details and application forms. Applicants will be sent information on accommodation.

#### TROPICAL BRYOLOGY GROUP - PROPOSED TRIP TO MALAWI

The TBG has been hoping for some time now to arrange a trip to the tropics, and a possible destination has now appeared - Malawi (probably Mt. Milanje). If such a trip were organised for three weeks in June/July 1991, we need to know how many people would be seriously interested. There would only be a limited number of places, particularly if sponsorship money is to be found, and it is not possible at this stage to say how much it would cost. Unfortunately the trip may coincide with the BBS/IAB Sphagnum meeting, and would only be a month before the BBS trip to the Massif Central, but this seems to be the best time of the year to go, and will consequently coincide with a normal BBS excursion whichever year is chosen. This trip has not yet been arranged by BBS Council, but it is important to get information about the level of interest now, rather than wait for the next Bulletin.

Would anybody who is interested please contact David Long, Royal Botanic Garden, Inverleith Row, Edinburgh EH3 5LR.

#### IAB/BBS JOINT MEETING ON THE BIOLOGY OF SPHAGNUM & EXPERIMENTAL BRYOLOGY, 1991, GLASGOW-EXETER.

##### **THE BIOLOGY OF SPHAGNUM, EXETER, 17-18 JULY 1991**

Organiser: Dr R.E. Daniels, Institute of Terrestrial Ecology, Furzebrook Research Station, Wareham, Dorset BH20 5AS. Tel. 09295 51087.

Held at the University of Exeter, this meeting will include sessions on the following topics: taxonomy and systematics, biogeography, population genetics, physiology, eco-physiology, peat forming systems and Sphagnum and man. There will be invited speakers on each subject but contributed papers are also invited. Offers of contributed papers should be made to the organiser at the address above. This symposium will be preceded by a **field meeting on 12-16 July**. This will probably begin in Glasgow and visit a number of classic sites for Sphagnum species and peatland types while travelling southward, finishing in Exeter for the symposium.

##### **EXPERIMENTAL BRYOLOGY, EXETER. 19-23 JULY 1991**

Organiser: Dr M.C.F. Proctor, Hatherly Laboratories, The University, Prince of

Wales Road, Exeter EX4 4PS.

This meeting will include both symposium and field days. Symposium sessions will cover the following subjects: biochemistry and metabolism, fine structure, reproduction and control of development, environmental physiology and experimental ecology, biosystematics and population biology and pollution and conservation. There will be invited keynote speakers and contributed papers. Offers of contributed papers are welcomed by the organiser (address above).

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#### OTHER BRYOLOGICAL MEETINGS

**31 March-1 April, 1990: Bryophytes.** Rod Stern.

This course will be suitable for beginners as well as those who have some knowledge of this group of plants. Studies will include visits to downland and woodland habitats as well as laboratory work to assist identification and understanding of the structure of bryophytes. Register at Birkbeck College, Centre for Extra-Mural Studies, 26 Russell Square.

**27-30 April, 1990: Beginning Mosses and Liverworts.** Highland Field Studies, Perthshire (see below for details).

**28 April, 1990: Beginner's Workshop.** Dr Sean Edwards and Dr Martha Newton. To be held at the Liverpool Museum, William Brown St., Liverpool L3 8EN.

Further details from Heike Hofmann at the above address or phone 051-207 0001 ext. 209.

**4-8 June, 1990: Discovering Mosses and Liverworts.** Dr M.E. Newton, Drapers' Field Centre, Rhyd-y-creuau, Betws-y-coed, Gwynedd, LL24 0HB.

Details from the Warden, Mr A.J. Scharer, at the above address.

**18-25 August, 1990: Mosses and Liverworts.** Dr M.E. Newton, Kindrogan Field Centre, Enochdhu, Blairgowrie, Perthshire, PH10 7PG.

Details from the Warden, Dr A. Lavery, at the above address.

**25 August-1 September, 1990: Bryophytes.** Highland Field Studies, Perthshire (see below for details)

**31 August-7 September, 1990: Mosses and Liverworts.** Dr M.E. Newton, Preston Montford Field Centre, Montford Bridge, Shrewsbury, SY4 1DX.

Details from the Warden, Mr J.A. Bayley, at the above address.

**7-14 September, 1990: Mosses and Liverworts.** Dr M.E. Newton, Malham Tarn Field Centre, Settle, North Yorkshire, BD24 9PU.

Details from the Warden, Mr K. Iball, at the above address.

#### Highland Field Studies

Courses on bryophytes, particularly suitable for beginners, will be held from April 27-30 and from August 25-September 1, 1990. These will be based near Dunkeld, Perthshire and will be led by our member Brian Brookes who has run these courses for many years. Further information from Brian Brookes, Highland Field Studies, Borelick, Trochry, Dunkeld, Perthshire PH8 0BX (sae appreciated).

## XV INTERNATIONAL BOTANICAL CONGRESS, TOKYO, 1993

The Organising Committee of the XVth International Botanical Congress wishes to announce that the XV IBC will be held in the Tokyo area during August and September, 1993: nomenclature session 23 - 27 August; general session 28 August - 3 September. The first circular of the XV IBC will be prepared in 1990 and distributed to those who are interested in the Congress. Request for information and other questions and comments may be sent to the Secretariat at the following address: XV International Botanical Congress, Department of Botany, Faculty of Science, University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113, Japan.

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### COUNCIL NEWSLETTER NUMBER 6

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When this series was started in 1984, it was with the intention of encouraging all BBS members to give Council the benefit of their views on topics under consideration. By doing so, the work of Council could be speeded along and decisions to be made would become easier. Therefore, please continue to let the General Secretary or other appropriate Officer have your comments. If you think there are extra topics that might be discussed by Council, those suggestions would also be greatly welcomed. The following, among other things, are being acted upon at the moment:

#### Business matters and subscriptions

Total membership remains steady at something over 500, but costs, particularly the cost of producing the *Journal of Bryology*, have increased significantly. As a result, the Society met from its reserves an operating deficit of just under £5,000 during 1988, and is expecting to do so again for the current year. Reserves are therefore predicted to fall below £20,000 in two year's time. This has persuaded Council to propose a subscription increase to be put to the AGM in 1990. If approved, it would have effect from January 1991 and would be the first rise since the present rate of £10 was set eight years ago.

#### Bryophyte distribution atlas

It is a pleasure to report that the Society's mapping scheme, strongly supported by members for nearly 30 years, is about to come to fruition in the publication of an atlas of bryophyte distribution in the British Isles. Preparation of volume 1, on liverworts, is on schedule and the manuscript will go to press at the end of 1989, followed at annual intervals by two further volumes on mosses. This is a major achievement of combined effort and will be of considerable benefit to bryologists, not only in Britain, but also abroad. In seeking subsidies, every effort is being made to ensure that the price will be within reach of as many members as possible.

#### Future recording activities

Council is anxious that the atlas should not be seen solely as the end of an era of intensive recording that has made the British bryophyte flora one of the best known in the world. Anticipating, therefore, that the atlas will stimulate even greater interest in matters of distribution, discussions have begun with a view to determining the best ways of encouraging and co-ordinating the work which will follow. Among ideas currently favoured is the continued collection of records with the intention of updating the atlas after a suitable interval. The possibility of establishing a network of regional recorders or contacts is also being explored.

## Bryophyte conservation

This remains prominent in the Society's affairs, the BBS taking an active part in the work of the Conservation Association of Botanical Societies (C.A.B.S.). It is work which includes the preparation, in conjunction with the Nature Conservancy Council, of a Red Data Book of threatened lower plants. C.A.B.S., with financial assistance from the BBS and other member societies, has also been instrumental in launching Plantlife, which is intended to become a broadly based society concerned with plant conservation.

## Special volumes

This year has seen the publication of early volumes of what is hoped will become a series of handbooks and guides on a wide variety of bryological topics. The first, "A Practical Guide to Bryophyte Chromosomes", is now on sale and the second, "A Guide to collecting Bryophytes in the Tropics", is due very shortly. The series is one which Council very much hopes will become a useful reference library, having been produced in response to those members who have stressed the educational role the Society ought to play.

## Meetings

Education is also to the fore in considering meetings, particularly the bryophyte workshop, but there are other interesting prospects, too. In addition to the familiar annual pattern of meetings, they include a field meeting in the Central Massif of France, joint international meetings in Britain during 1991 with the International Association of Bryologists, as well as plans to set up a network of regional contacts to promote meetings locally. Volunteers to become involved in this last project would be much appreciated.

## BBS Bulletin

Widely regarded as an important asset of the Society, it is thought that expansion of the Bulletin by the addition of special articles and, perhaps, illustrations would be a popular move, possibly financed in part by income from the Trudy Side bequest. Willing authors would, of course, be needed and members are urged to get in touch with the Bulletin Editor.

## Publicity

Two quite different topics must be mentioned in this context. One is that sweat-shirts bearing the BBS logo are expected to be ready for sale by next spring, and that a number of other ideas are being investigated. The other is that the superb BBS travelling exhibition, "A Secret Garden: the Hidden World of Mosses and Liverworts", continues to attract attention; it will be displayed at Liverpool Museum from 3 March to 30 June, 1990. During that time, the Museum proposes to run a one-day course of tuition on bryophytes for interested members of the public.

## Archives

Over the years, the Society has accumulated archives which are mainly in the form of correspondence, notebooks and photographs. Since some can be expected to be of historical as well as bryological interest, Council wishes to ensure their safety until such time as they can be catalogued and made available for study. At the last Council meeting, it was decided to advertize for an archivist to care for this material. Dr M.R.D. Seaward kindly volunteered to look after the photographs and to bring them to meetings for naming. Someone willing to make a similar commitment to the safe-keeping of the documents is still very much needed.

M.E. NEWTON

## B.B.S. LIBRARY SALES AND SERVICE 1990

### 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 those cases where copyright has expired. Charge 10p per exposure. Limit 50.

(a) Approximately 250 bryological books, journals and several thousand off-prints 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 of mounts) 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.

### FOR SALE:

British Bryological Society Bulletins: Back numbers from No: 23 @ £1.00 each.

Transactions of the British Bryological Society/Journal of Bryology:

Vol. 1	parts 1-5 (£2.40 each)	£12
Vol. 2	parts 1 (£3.00) parts 2-4 out of print	
Vols.3 & 4	parts 1-5 (£2.40 each)	£12 per vol.
Vol. 5	parts 1-4 (£3.00 each)	£12
Vol. 6	parts 1-2 (£6.00 each)	£12 - ends the series of <u>Transactions</u> .
Vols.7-9	parts 1-4 (£5.00 each)	£20 per vol.- renamed <u>J.of Bryology</u> .
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	parts 1-4 (£15.50 each)	£62
Vol. 14	parts 1-4 (£18.00 each)	£72
Vol. 15	parts 1-4 (£22.50 each)	£90

### 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.	Distribution of Bryophytes in the British Isles	1981	
& Hill, M.O.	(A Census Catalogue of their Occurrence in Vice-Counties)		
	Price incl. P & P Non-members (£6), Trade (£4), Members (£5.00)		

### Other Items:

Longton, R.E. & Perry, A.R.	Proceedings of Jubilee Meeting, 1983. 1985	(£6.00)
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)
Newton, M.E.	A Practical Guide to Bryophyte Chromosomes.	1989 (£2.50)
Evans, D.E. & Perry, A.R.	Moss Wall Chart. Price including P & P.	1987 (£2.80)
Newton, M.E. et al.	Bryology: modern research and the ways forward.	1988 (£5.50)

BBS Tie, Claret with BBS logo	(£4.95)
Swift x20 Handlens and Leather Case	(£9.00)
Idealteck No. 3 Stainless Steel Forceps	(£4.50)

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PLEASE DO NOT INCLUDE CASH WITH U.K. ORDERS. CUSTOMERS WILL BE INVOICED FOR THE CORRECT AMOUNT INCLUDING P & P. (POSTAGE & PACKING EXTRA UNLESS STATED). ADDRESS LABELS LEGIBLY PRINTED APPRECIATED.

All the above items are available from the BBS Librarian:

Kenneth J. Adams, 63 Wroths Path, Baldwins Hill, Loughton, Essex, IG10 1SH



## BRYOPHYTE CONSERVATION IN BRITAIN - CURRENT SCENE

We know that Britain is one of the richest countries in Europe, if not the richest, in terms of its bryophyte flora, so we have an international responsibility for the conservation of that flora. Statutory protection of bryophytes begins with the 1981 Wildlife and Countryside Act, which specifically forbids the unauthorised "uprooting" of any wild plant. This includes bryophytes, in spite of their rootlessness. Schedule 8 of the Act consists of a list of plants given more specific protection. These specially protected plants must not be "intentionally picked, uprooted or destroyed", or offered for sale. Unfortunately there are currently no bryophytes on the Schedule, but a list of appropriate species will be recommended for inclusion at the next review of the Act in 1991.

Further statutory protection of bryophytes is achieved by the Nature Conservancy Council (NCC) including important bryophyte sites in Sites of Special Scientific Interest (SSSIs). Many of the best sites for bryophytes have in the past been included in SSSIs more or less incidentally, because of other interest, such as birds or flowering plants, and many have found their way into the Nature Conservation Review (Ratcliffe, 1977), the very cream of sites of natural importance in Britain. However, it is only recently that the NCC has been able to notify SSSIs purely for their bryological interest, and in fact only a handful of such sites exist. New guidelines on notification of sites for bryophytes (and other cryptogams), currently being drawn up, should ensure that there is a reasonably objective basis for SSSI notification in the future.

Two important initiatives currently under way are the Cryptogam Red Data Book and the Bryophyte Atlas. The RDB is being compiled by Nick Stewart of CABS who, on an NCC contract, is building up a computer database of all the rare (i.e. recorded in 15 10km<sup>2</sup> squares or fewer in Great Britain) species of bryophyte, lichen and charophyte. The end product will be a valuable instrument to raise the profile of cryptogams with conservationists and statutory bodies, as well as a useful baseline for monitoring these rare plants. The Atlas, another NCC-funded project, based at the Biological Records Centre at Monks Wood, will be a milestone in the progress of bryological recording in Britain, and essential in the science-based conservation of bryophytes. The first volume (Hepatics) will be produced shortly.

As well as the many obviously rare species of bryophytes in Britain, there is a number of species widespread in western Britain that are considered (Schumacker, 1988) to be under threat in Europe as a whole. These include Saccogyna viticulosa, Plagiochila spinulosa, Breutelia chrysocoma and Campylopus atrovirens. This is something for British bryologists to be aware of, as it helps in understanding the significance of British bryophyte communities in an international context.

Relatively few species have become extinct in Britain, and these for a variety of reasons. For example, on the only occasions that Bryum lawersianum has been seen, it has been collected, leading to its presumed extinction, while the few fragile sites for Paludella squarrosa and Helodium blandowii were drained without a thought for their rare occupants. Indeed, the wider threats to bryophytes are those of habitat destruction and pollution. Bryophytes are, in a sense, fortunate that some of the places they favour most (ravines, upland "wastes", etc) have historically been relatively unattractive in terms of commercial exploitation, so that while vast tracts of forests have been cleared (no doubt to the detriment of bryophytes, along with other groups), there have always remained "core areas" of wooded ravines and inaccessible wooded slopes, with their bryological denizens. The very lifestyle of many communities, particularly the saxicolous ones, has been instrumental in their protection.

However, modern phenomena such as pollution, afforestation of the uplands, skiing developments and (perhaps more significantly than any of us yet realise) liming of upland catchments to combat acidification, all eat away at our bryological capital.

Pollution is particularly insidious, and takes many forms. While it is now becoming widely accepted that atmospheric pollution is a problem, and measures are being taken to combat it, with the subsequent re-appearance of many pollution sensitive epiphytes in some parts of the country, there is still the sinister legacy of pollution of waterways and groundwater that would take years to disappear from the system even if something was done about it immediately. As it is, it seems inevitable that wetland and riverine bryophytes will continue to suffer for a long time to come.

There are two areas where Britain has a particular international responsibility for bryophyte conservation: Atlantic communities and bogs. It is estimated that Britain may contain up to 13% of the world's blanket bog resource, and NCC has been fighting strongly for its conservation for many years, culminating in the "Birds, Bogs and Forestry" report on the Caithness and Sutherland "Flow Country" (Ratcliffe and Oswald, 1987).

Atlantic communities have been less well served, perhaps because their major significant biological interest is cryptogamic. However, it is considered essential to give proper protection to the best of the western ravine woodlands, and other similarly rich Atlantic areas, and this will be reflected in the new SSSI guidelines.

The BBS, the county Wildlife Trusts, the new Plantlife and other voluntary bodies also have an important role to play in bryophyte conservation. The BBS Code of Conduct, recently incorporated into a more general Code of Conduct for the Botanical Societies, has played an important part in increasing the awareness of bryologists of the importance of considering conservation alongside their other bryological activities. With so much pressure on the remaining areas of value, it is incumbent upon all bryologists to try to promote bryophyte conservation in any way they can, and not to be apologetic about it!

NICK HODGETTS  
CSD Lower Plant Specialist

#### References

- Ratcliffe, D.A. (1977). A Nature Conservation Review. CUP, Cambridge.  
Ratcliffe, D.A. & Oswald, P.H. (eds) (1987). Birds, Bogs & Forestry. NCC Peterborough.  
Schumacker, R. (1988). Provisional list of endangered bryophytes in Europe including Macaronesia with special attention to EEC countries. G.T.C.B.E., Belgium.

#### Editor's Note:

These are two current conservation issues of direct relevance to bryophytes that members might like to write to their MPs about:

1. The NCC split.  
Points to emphasize:
  - a. That a central scientific advisory team with a Great Britain-wide remit should be retained, and should include a permanent lower plant specialist.

- b. The importance of a GB-wide approach to bryophyte conservation, in site assessment and grading, determination of species for special protection, etc.
- c. The international importance of the British bryophyte flora, which does not respect boundaries, and the value of presenting a coherent face to the international community. A fragmented or parochial approach will lack credibility.

Also write to the Secretary of State for the Environment.

## 2. The Lurcher's Gully skiing proposals.

The major points:

- a. That the proposals will encourage excessive public access to the summit plateau, thereby endangering fragile communities such as those of late-lying snow patches and montane flushes, and seriously eroding the wilderness value of the site.
- b. Lurcher's Gully is the only unspoiled area on the north side of the Cairngorms massif that shows a gradual continuum of vegetation from the relatively low ground of the Rothiemurchus Forest to the summit plateau.

Also write to the Secretary of State for Scotland.

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## LOCAL FLORA PROJECTS

BBS members are invited to contribute to the following local bryophyte flora studies which I am organising.

1. Berkshire - A well advanced project involving mapping of species' distributions using 5x5km squares of the National Grid. The area under consideration is old (pre-1974) Berkshire i.e. vice-county 22. It is hoped to complete field recording for this projected 10 year study by the end of 1992.
2. Aberystwyth area - Stretching from Cadair Idris in the north to Cors Caron (Tregaron Bog) in the south, the area includes the Plynlimon range, much of the Dyfi catchment and the headwaters of the Teifi. Parts of Merioneth (v.c. 48), Montgomeryshire (v.c. 47) and Cardiganshire (v.c. 46) are incorporated. Apart from a few famous localities such as Borth Bog, Ynyslas dunes and Cadair Idris the area is mostly bryologically poorly known or knowledge is based on old records. This study is also based on mapping with 5x5 km squares. It provides an ideal opportunity to obtain data on altitudinal ranges of species within a narrow latitudinal range. Records are being separated into pre-1959, 1950-79, post-1979. I commenced recording in 1983. Records incorporated in M.O. Hill's (1988) A Bryophyte Flora of North Wales (J. Bryol. 15, 377-491), which overlaps part of the area, need not to be submitted.
3. Belle-Ile - In 1990 I hope to complete a bryophyte flora for this island which lies off the coast of Brittany (Morbihan Department). If you have collected bryophytes there or studied the vascular plant flora I would be delighted to hear from you.

For further information about any of these projects please contact:

Dr JEFF BATES, Department of Pure & Applied Biology, Imperial College at Silwood Park, Ascot, Berkshire, SL5 7PY.

## Tropical Bryology Group - Progress

The reasons for setting up a tropical bryology group in the BBS were probably first formally stated in Royce Longton's paper to the BBS Jubilee Meeting in 1983 (Longton, 1985a) where he wrote persuasively of the urgent need in the tropics to speed up the traditionally measured approach to bryological advance, particularly in taxonomy, and this was followed by a note in the *Bulletin* (Longton, 1985b). However, the first meeting of BBS Tropical Bryology Group (TBG) Working Party was not until May 1988 (Wigginton, 1988 (*Bulletin* 52)), after positive feedback from the BBS membership of the need for such a group. This progress report is to describe what has happened since.

All members of the working group have found it difficult to devote as much time as they would have liked to this project, but some progress has been made, and another meeting of the group has been arranged. Progress is as follows:

- The last report in the *Bulletin* said that the priority task for the group was the production of a guide to collecting bryophytes in the tropics, and this is now published as the BBS Special Volume no. 3.
- A list has also been produced of unworked collections at Edinburgh, but these proved to be very few.
- No real progress has been made in organising a trip to the tropics, although several useful ideas have been suggested, and a decision will be made on this at the next meeting of the Working Group.
- The TBG have agreed to help organise the 1990 Paper Reading Meeting, in celebration of Paul Richards and Eustace Jones, when part of the programme will have a tropical slant.
- A preliminary list has been produced of herbaria in the UK with tropical holdings, but needs extending, particularly to cover BBS members' tropical collections.
- A preliminary bibliography has been produced (based on that of the 'guide to collecting' booklet) but this now needs extending. It is hoped that this will lead to extra books being acquired by the BBS Library.
- The next meeting of the Working Party has been arranged for February 23rd, when the future direction of the group will be discussed - see next paragraph.

There are many possible future activities, including the following:

- Establish goals and objectives for the TBG.
- Continue existing activities, e.g. listing tropical collections in the UK, and organising a tropical trip.
- Produce guidelines for working with tropical collections.
- Review activities so far proposed, and look for new projects.
- Review how the TBG should be organised, encouraging active participation by BBS members, rather than just passive interest - particularly amongst those not already involved in tropical bryology.

- Investigate links with groups outside the UK.

The emphasis will be on finding a focus for the group, establishing a mechanism for reviewing its activities, and harnessing the energies of those members who are interested in participating. Progress and activities will be reported in the *Bulletin*.

#### References

Longton, R.E. (1985a). Future Developments in Bryology. In: *British Bryological Society Special Volume No. 1. "British Bryological Society Diamond Jubilee"*. Ed. R.E. Longton and A.R. Perry, Cardiff.

Longton, R.E. (1985b). Tropical Bryology Group. *Bulletin of the British Bryological Society*. 45, 21 (February 1985).

Wigginton, M. (1988). Tropical Group: 1st Meeting of the Working Party - abbreviated minutes. *Bulletin of the British Bryological Society*. 52, 27-28 (July 1988).

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Brian O'Shea, 131 Norwood Road, London SE24 9AF

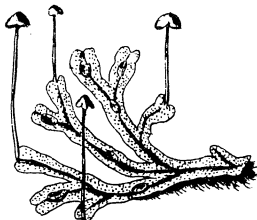
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#### Tropical bryophyte collections by BBS members

There are now a number of BBS members who have made collections in the tropics, or have received tropical specimens from others, and hold these in their personal herbaria. As part of a project for the BBS Tropical Bryology Group, I would like to receive information about these collections - in particular: countries where collections have been made, number of collections (divided into mosses, hepatics and anthocerotates if this is possible), progress in identification, who (if anyone) has given assistance in identification, books/papers used, problems found both in collection and identification, equipment and techniques found useful, and any other information that might be useful. Initially, it would be a good start if members would just let me know that they have bryophytes collected from the tropics, and details can be filled in later.

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Brian O'Shea, 131 Norwood Road, London SE24 9AF



## DEUTSCHLANDS MOOSE

by Ruprecht Duell &amp; Ludwig Meinunger

Die Verbreitung der deutschen Moose in der BR Deutschland und in der DDR, ihre Hohenverbreitung, ihre Arealtypen, sowie Angaben zum Ruckgang der Arten. I. Teil: Anthocerotae, Marchantiatae, Bryatae (Sphagnidae, Andreaeidae), Bryidae (Tetraphidales - Pottiales). 1989, IDH-Verlag, Bad Munstereifel-Ohlerath. 368 pages, with 4 maps and 98 distribution maps.

This is the first volume of a projected 3-volume work which will cover the entire bryophyte flora of Germany, and will include all important varieties. The most important synonyms are listed and the altitudinal range of each taxon in Germany is given.

PRACTICAL GUIDE TO BRYOPHYTE CHROMOSOMES  
(British Bryological Society Special Volume No. 2)

by M.E. Newton. 24.5 x 16.4 cm. 23 pages with 8 text figures including 3 half-tone plates. 1989. Published by and available from the British Bryological Society, National Museum of Wales, Cardiff CF1 3NP, United Kingdom. ISBN 0 950 7639 3 4. Price £2.50p + 50p package and posting (surface mail).

This is a book to bring an understanding of chromosomes within the grasp of everyone. In explaining the role of chromosomes, it assumes no prior knowledge and guides the reader, step by step, through an examination of the structural and behavioural changes occurring during the bryophyte life cycle. Copiously illustrated, it provides detailed instructions for preparing chromosomes for microscopical examination and offers assistance in interpreting results derived from four different staining techniques; one of them the extremely informative Giemsa C-banding technique. Although primarily intended for bryologists, the account will also be useful to general cytologists interested in other plants and animals, and the subject can be studied further by means of a list of additional reading.

A GUIDE TO COLLECTING TROPICAL BRYOPHYTES  
(British Bryological Society Special Volume No. 3)

by B.J. O'Shea. 24.5 x 16.4 cm. pages with text figures. 1990. Published by and available from the British Bryological Society, National Museum of Wales, Cardiff CF1 3NP, UK. ISBN 0 950 7639 4 2. Price £3.50p + 50p postage and packing (surface mail).

The guide is intended for any individual or groups going to collect bryophytes in the tropics, but it is particularly aimed at student or amateur expeditions. It includes contributions from a number of bryologists with experience of collecting in the tropics. It covers preparation (though not expedition planning in general); how much you need to know about bryophytes and how to go about identifying them (including suggested literature); where to look; how to collect, label and dry them and how to get them home. There are also suggested research topics and an extensive annotated bibliography. There is an orientation towards a UK/European readership in sources of books, materials and information but the booklet would otherwise be suited to any bryologist who has not ever visited the tropics - and indeed would be useful to a student of any other plant group.

## REFEREES (March, 1990)

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 David Long for hepatics (The Herbarium, Royal Botanic Garden, Edinburgh, EH3 5LR) or Mr Tom Blockeel for mosses (9 Ashfurlong Close, Dore, Sheffield, S17 3NN).

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:

#### HEPATIC REFEREES:

1,2,11,12,58: Vacant

3-10,18-24: Dr M.E. Newton, Dept. of Botany, Liverpool Museum, William Brown Street, Liverpool, L3 8TN (All mail to be marked 'Confidential')

13-17, 36,37,39-44: G.P. Rothero, Benmore Centre, by Dunoon, Argyll

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

38,53-55,64-67,69: D.G. Long, Royal Botanic Garden, Edinburgh EH3 5LR

48-52, 78-86: M.J. Wigginton, Nature Conservancy Council, 70 Castlegate, Grantham, Lincolnshire, NG 31 6SH

56,57,59-63,68,70-74: T.L. Blackstock, Nature Conservancy Council, Ffordd Penrhos, Bangor, LL57 2LQ

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

#### MOSS REFEREES:

1: Dr M.O. Hill, Monk's Wood Experimental Station, Abbots Ripton, Huntingdon, PE17 2LS; A. Eddy, Department of Botany, British Museum (Natural History), Cromwell Road, London, SW7 5BD

2-10,143: Dr 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: M. Yeo, 49 Arlesey Road, Ickleford, Hitchin, Herts., SG5 3TG

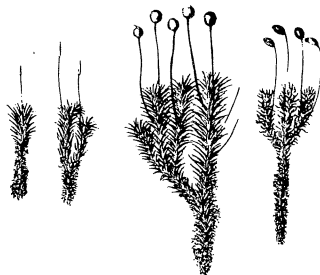
40-61: Dr D.F. Chamberlain, Department of Botany, Royal Botanic Garden, Edinburgh, EH3 5LR

82-90,105: Dr E.V. Watson, Little Court, Cleeve, Goring on Thames, Reading, Berkshire, RG8 0DG

91-95: A. Orange, Dept of Botany, National Museum of Wales, Cardiff, CF1 3NP

106-138: M.J. Wigginton (address above)

139-142,144-175: A.C. Smith, End House, 24 Shelfanger Road, Diss, Norfolk, IP22 3EH



## ATLAS OF THE BRYOPHYTES OF THE BRITISH ISLES

After 30 years of preparation, during all of which Tony Smith has been Mapping Secretary, the first volume of the BBS atlas has gone to press. Volume 1, dealing with liverworts, contains maps of each species, together with notes written by BBS members. It also includes an account of the history of bryophyte recording in Britain, by Chris Preston. Volume 2 (Haplolepideae and anomalous mosses) and Volume 3 (Diplolepideae) are planned to follow at yearly intervals after Volume 1.

The BBS atlas is a milestone in bryophyte recording, and, far from superseding the vice-county recording scheme, has shown how very useful that is. All records in the mapping database were checked to see if they matched the Census Catalogue. Marcus Yeo searched diligently for errors of omission; errors of commission were simply deleted. So vice-county records have provided an essential check on accuracy and completeness.

The atlas will be offered to BBS members at a discount, but final details of price are not yet available.

M.O. HILL

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## PAUL RICHARDS AND THE KORUP NATIONAL PARK, CAMEROUN

This is an appeal for support for the conservation of one of the most important rain forests in Africa which, at the same time, will commemorate the works of Paul Richards, one of the founders of the study of the ecology of tropical rain forests.

The work required to set up the national park includes rural development schemes in the surrounding area as well as the provision of facilities for scientific, administrative and ground staff for the Park. The plans for the Park will make it of international status and application will be made to have it designated a World Heritage site. A complementary project is planned for the establishment of a national park at Oban in Nigeria so that the two parks will share a common international boundary.

The headquarters of the Korup National Park will be at Mundemba. Among the buildings planned there will be an information and education centre. This building will be named the Paul Richards Centre in commemoration of his vital contribution to our understanding of tropical rain forests.

The Family and Friends of Paul Richards have set out to raise £120,000 to pay for the costs of this centre. The planning and building of the centre will be carried out as part of the technical assistance provided through the agreement between the World Wide Fund for Nature and the Government of Cameroun.

Korup forest in the South West of Cameroun is probably the most species rich rain forest in Africa. During the ice ages when the climate of Africa became much drier, much of the rain forest disappeared. Some small areas in the west provided refuges for the survival of the species which then spread out again as the climate became wetter. Korup was such a refuge and today has many species not found elsewhere. Because of its isolation it has remained in more or less pristine condition. It was declared a national park by the Government of Cameroun in 1986 and an agreement was made with the World Wide Fund for Nature (UK) for technical assistance in establishing and maintaining the reserve. Because of the enormous biological interest of the Forest, plans for the national park will give priority to scientific work and educational facilities for the local population.



About 400 tree species have already been recorded in the forest. As well as the endemics and species typical of West African forests, many species typical of central Africa reach their western limit of distribution there. It also appears to be the centre of diversity of several scrub genera such as Cola and Diospyros.

The forest is very important for primates and about 25% of all African species are thought to occur there, including the endemic and endangered drill, Preuss' red colobus monkey and the chimpanzee. Other interesting mammals include an endemic water-shrew, the golden cat, the forest leopard, elephant and buffalo, the water chevrotain and the endangered Cameroun clawless otter. The forest is very important for birds and about half of all African species of passerines probably occur there. The endangered Pithacartes oreas is also found.

PAUL RICHARDS KORUP FUND

Please support our appeal and help to build the Paul Richards Centre and to preserve this unique area of rain forest.

Sponsors: Peter Raven (Director Missouri Botanic Gardens, USA)  
John Hall (Department of Forestry, UCNW Wales)  
Catherine Richards  
Martin Richards  
Mary Chown  
Sarah Richards

You may contribute in one of two ways:-

1. By cheque or bankers order payable to Paul Richards Korup Fund.  
To save costs, receipts will not be sent unless specifically requested.
2. By deed of covenant. Because tax may be recoverable, we hope that people may opt for this method of payment. Please write for a form.

The address for all communication is:  
57 Selwyn Road, Cambridge, CB3 9EA, England

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#### HETEROSPORY IN MACROMITRIUM: A CONFUSING TERMINOLOGY

Bell (1989) described the confusion that existed for 50 years through the belief that Sphagnum showed heterosporosity, until it was realised that the capsules with small spores resulted from fungal infection. Bell concluded: 'Genuine heterosporosity in mosses had to await the discovery of the situation in Macromitrium'. This comment raises a further source of confusion.

The term heterosporosity is used for two basically different phenomena, exemplified by Selaginella and Macromitrium respectively. In both there is a size difference in the spores, with the large spores associated with a female gametophyte and the small spores with the male. In Selaginella the large spores are produced in different sporangia from the small ones, whereas in Macromitrium they arise in tetrads of two large and two small within a single sporangium. In Selaginella the spore size difference develops following the differentiation of two kinds of sporangia in the parent diploid plant, whereas in Macromitrium the difference arises wholly in the haploid generation following segregation of genetic determinants at meiosis.

Heterosporosity is commonly regarded as a step towards the seed condition. This is true only if the term heterosporosity is restricted to the condition exemplified by Selaginella. The situation in Macromitrium is in no sense a step towards that

found in seed plants. One possibility to resolve the confusion would be to limit the use of the term heterospory to the Selaginella condition and to use some other expression such as spore dimorphism or anisospory for the Macromitrium condition. A better solution might be to coin a term such as 'heterangy' for the Selaginella and seed-plant situation. This would draw attention to its fundamental feature, namely, the occurrence of two kinds of sporangia. Anisospory could be used for Macromitrium, to avoid using the ambiguous term heterospory.

Bell, P.R. (1989). 'Heterospory' in Sphagnum: fifty years of error. J. Bryol. 15, 679-682.

H. L. K. WHITEHOUSE

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#### THE "SECRET GARDEN" AND TORTULA BREVIS AT BRIGHTON

At the beginning of October 1989, the Booth Museum of Natural History at Brighton borrowed the BBS Exhibit for a 6 week period. At their invitation, Francis Rose, Howard Matcham and I gave an interview by the exhibit in the Booth Museum for Radio Sussex - a good 10 minutes or so. The exhibit looked very good in a prominent place in the Museum and Dr Gerald Legg of the Museum had added some superb close-ups he had taken of Tortula brevis in fruit.

The Tortula brevis story is quite amusing. Unusually for me, I had arrived early for an appointment arranged some months previously with Gerald Legg and other museum staff about the forthcoming atlas. Opposite the museum is a public park and while looking at the abundance of Marchantia in the flower beds, I noticed a "standfordensis" type of moss. Shortly afterwards I told Gerald Legg about the Tortula brevis which Harold Whitehouse had confirmed in the meantime. As it was right opposite the Museum, Gerald arranged massive "media coverage", as a result of which the moss (new to Sussex of course) was literally headline news in the local papers and I was interviewed about it on Radio Sussex! Subsequently Howard Matcham found it in another park in Brighton (also V.C. 13) and I found it in Preston Park just in V.C. 14. It was quite abundant in many places and fruiting very well, no doubt because of the mild conditions and wet April.

The "Atlas of Sussex Mosses, Liverworts and Lichens" (Rose, Stern and Matcham) is due to be published by Booth Museum as their centenary publication in 1990.

ROD STERN

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#### HOOKED LEAF APICES AND ADPRESSA VARIATION IN PHILONOTIS

In adpressed varieties of the Philonotis species the leaves are found to be closely adpressed to the stem surface and do not separate outwards from it to any appreciable extent when the shoots are soaked in water. In addition, there is often development of a cucullate (hooded) shape by the upper lamina. Hooking of the extreme apices of otherwise unaltered leaves can be an indication of a tendency to the development of adpressa variation in Philonotis. This hooking occurs well in advance of any cucullate development. Over a number of years I have noted that leaf apex hooks are a fairly reliable indication of the development of adpressa varieties in Philonotis fontana and Philonotis caespitosa.



J.H. FIELD

## COARSE POLYTRICHUM GROWING

My collection of live mosses was moved into an aluminium framed greenhouse in summer 1986. They have now been there long enough to make some comments worthwhile.

Polytrichums are an acid test, in more than one sense, of a basic need when growing most mosses under semi-natural conditions. The tomentum, leaf bases and lamellae, readily carry water up from a wet substrate, together with its dissolved substances. Unless these are leached out by sufficiently frequent and thorough spraying, the plants will deteriorate within a few months.

Given such spraying, most British species should grow fast, well and reliably, if treated like sphagnum. Most of mine are in plastic pots of horticultural peat, standing waterlogged in trays of rainwater. Partly shaded by a tree, they get direct hot sunlight between 2 and 5 pm from April to August. New shoots grow throughout the year, but slowly in the colder winter months, with a peak in spring. After 2-3 years moribund old shoots need removing, or a new culture should be started.

There are enough exceptions to make the genus as a whole interesting to growers. P. piliferum and P. formosum are drought-resistant and will grow, though slowly, in similar but non-waterlogged intermittently dry conditions. They also grow well on loose mineral acid soils.

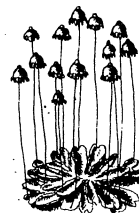
Pogonatum aloides needs a firm acid substrate, clay or loam, such as can be collected in many habitats. I have found pottery clay too alkaline. The protonema is damaged by desiccation. It may be grown waterlogged in strong light, or non-waterlogged in shade, tolerating as little as 10% of ambient light. It can be unpredictable. If growing well it takes a year or so to fill the available space. Cultures have a useful life of 2-3 years. Some fruit in spring. I have not grown P. nanum.

Less successful here, and therefore more interesting, are three species, Polytrichum sexangulare, Pogonatum urnigerum and Oligotrichum hercynicum, which I keep on mineral soils, acid sand, loam or granite chippings. They dislike high summer temperatures, but also dislike shade and have been no more successful in cooler more shaded sites within the greenhouse. The last two persist or appear rarely in a variety of wet acid conditions, growing best in spring and worst in warm autumn weather. The last I have lost once, and barely kept since 1986, well lit on waterlogged sand among lowland polytrichums. It has trouble in establishing a seasonal growth rhythm.

I think that to flourish in a greenhouse in southern England these 3 species may need artificial light or refrigeration. Any experience of growing them, or related plants, would interest me.

List/printouts of most groups or genera of mosses/hepatics at present being grown here are available on request, and also a brief general description of the whole collection. Please send SAE.

Michael V. Fletcher, 70 South Street, Reading, Berks, England.



## PREPARATION OF ILLUSTRATIONS FOR PUBLICATION

by R.M. Schuster

(1) I make cleared preparations (in Hoyer's Fluid) and, for whole plants, place them in depression slides (an ordinary slide with "props" at the corners - bits of cover slips will do). It is important not to squash the plant! My drawings of whole plants attempt to retain the three-dimensional aspect of even nearly flat plants.

(2) I use a Bausch & Lomb "fiber projector" -- now, unfortunately, no longer manufactured. However, this is basically merely a microscope, with Abbe condenser and iris diaphragm (+ mechanical stage), mounted upsidedown, on a vertical steel support. (The microscope is mounted on an arm which can be adjusted, vertically, to increase or decrease magnification; I have a nose piece with four objectives and 2-3 differing oculars, so there is an infinite range of magnification possible.) Critical is the light source and a lens to concentrate the beam. The more intense the illumination the more that is visible. The lamp (in a housing) on my projector is also mounted on an arm that can be moved vertically. I have seen (and years ago used) a similar projector made by Zeiss; I have seen similar projectors in Japan. The whole point is to project, on a table top in a dark room, a highly enlarged image which can then be traced in pencil; if the specimen is properly cleared, a three-dimensional image is visible (the third dimension can be deduced by careful focusing). My projection machine is mounted to a concrete wall so no vibration is possible: this means if, for example, cleared spores are projected, a drawing with a magnification of 1500-2000X is feasible.

(3) I normally make my "plates" 18-20 x 24-28 inches, so they are reduced 3.5-4X for reproduction. Advantages: finer and better shading of the inked drawings is possible; "wiggly" line work (with "entry" into the late-60's my lines are all getting wiggly!) tends to become smoother with reduction. For this reason alone I have always refused to use a camera lucida. After a series of drawings are projected to form a plate, the pencilled drawings are all corrected, using an ordinary microscope prior to inking. (The projected image, and that seen through the microscope, are reversed: this is the most difficult part about correcting projected images.)

(4) I use ordinary 2-ply, good quality drawing sheets, about the size noted above; for inking I use crowquill pens. They allow one to make lines that are thick or thin, depending on pressure on the point: and they allow one to taper from thick to thin, thus producing finished shading. (A rapidograph is bad: it allows one to produce only lines of uniform thickness; it may be alright for outlining but I regard it as an instrument for the amateur.) I use ordinary india ink and have avoided "modern" things like polyester film; when I commit or perpetrate some mistake, I use a razor blade. With practice, one soon learns how fine a line can be held by the photoengraver (and printer). Ultimately habit drawings should give the viewer the three-dimensional aspect of the plant; fine (and on reduction almost imperceptible) line work -- aside from outlining -- is the sine qua non of a successful plate.

(5) The major reason for drawing 3-4X the (eventual) published size is that drawings that large are easier on the nervous system: I have not, for years, been able to make adequate drawings which are reproduced 1:1 or reduced only 50%.

(6) In inking plates, I prefer to use a combination of lines (for greater density, cross-hatching) + broken lines + ultimately dots, rather than "stippling." (I often restrict myself to using stippled lines to indicate underlying structures, visible on cleared preparations; the basic architecture of the organism then becomes much more comprehensible.) Line work goes much

faster; if fine enough, on reduction, one is hardly aware of the lines. There is, incidentally, nothing wrong with exploiting the full spectrum from near-black (close-spaced cross hatched lines) to near-white (delicate broken lines or dots): habit drawings that give one a three-dimensional aspect almost demand exploiting as wide a range of densities as possible.

(7) At one time I used a cut-and-paste technique: the various bits and pieces were drawn individually, then pasted on a larger sheet. There are good reasons to avoid this technique: first, it is more work; second, by projecting all the bits and pieces that constitute a plate onto a single sheet of drawing paper one can use the available space much more efficiently. I have learned that there is nothing wrong in overlapping, say, part of a habit sketch with a projecting leaf, or underleaf: both can be drawn larger, so that there is more detail possible.

It is also feasible, using a single sheet of paper, to project the habit drawing first, and then "insert" details (stem anatomy, leaf and underleaf outlines, bract outlines, cellular details, etc.) into the odd-shaped spaces left. (It also makes for a more "naturalistic" plate; the grouping of figures on the page is, itself, "artistic" when done so there is some balance: "heavy" (heavily inked) figures and outline figures should be dispersed so that there is not too much "weight" at any one point, or corner, of the page.) This technique uses all the space on the page more efficiently: it costs just as much to reproduce white space as drawings! It also avoids what I regard as the "funeral parlor arrangement" -- rows of clearly dead leaves, of diverse sizes, laid out in neat rows, with lots of "dead space" between them.

(8) In recent years I have also projected on to the page a portion of the stage micrometer scale; when this scale is inked (and "attached" via a stippled arrow to the pertinent figure), the user can readily visualize the actual size of a plant (or organ; or cell, etc.)

I realize that the amateur is not likely to have a microprojector available. However, if an old monocular microscope can be "sacrificed" a metal-working shop can provide a vertical heavy rod, solidly attached to a base with four wide-spaced, short "legs", and make a "mount" attaching the microscope to the vertical rod (preferably so that vertical adjustment is feasible). A shop can also make a ventilated housing for a strong light source + attached condenser lens (an old "reading glass" biconvex lens, properly mounted, will do) -- preferably a light source with a rheostat, so that light intensity is adjustable. There are a variety of ways this can be accomplished. Most universities have old monocular microscopes at hand that, today, are hardly ever used and merely gather dust; these are prime candidates for conversion.

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#### FLUSHED LIVERWORT

Michael Fletcher has a toilet bowl in his house with the following inscription:

RICARDIA  
Armitage Ware. Reg.No.240441  
Made in England

In spite of the spelling error is this a new county record?

## GAMES TAXONOMISTS PLAY

or: Reasons for describing new species

or: Lumper's paranoia

by S.R. Edwards

### A) INCOMPETENCE

- i) tunnel vision: not considering species variability, or looking at enough material.
- ii) chauvinism: not checking descriptions in different languages, even from neighbouring countries.
- iii) parochialism: assuming that species from different parts of the world are necessarily different.
- iv) impatience: if you can't identify it in five minutes, make it a new species.

### B) KUDOS

- i) authority: having your name after a species.
- ii) sybiosis (or: you-scratch-my-back-I'll-scratch-yours): naming one after your buddy, who names one after you.
- iii) saturation (or: mud-on-the-wall): if you name everything you find, you're bound to get one in the end.
- iv) company: getting your name on various lists, with those of famous people.

### C) MACHINATION

- i) crawler: naming plants after your sponsor, in the hope of further expeditions, etc.
- ii) con-man: selling collections/exsiccatae, which with type specimens are worth much more.
- iii) gold-diggers: there's species in them thar aggregates/subspecies/apomicts/varieties/forms/whatever (splitter's paradise).
- iv) philosopher: I'll be dead before they find out.

### D) PRESSURE

- i) indoctrination: taxonomic theses are expected to contain something new, i.e. species.
- ii) publication: a paper not worth publishing, might be if it contained a description of a new species.
- iii) career: eminent taxonomists are expected to have named several new species.
- iv) rat race (ex-speedience): rushing into print with a possible species before somebody else does.
- v) politics: politically unacceptable names or work ignored.

I am assured that most of these games are now extinct and are of interest only to historians and biographers, but it is possible that there are still isolated areas where small bands of initiates persist in such practices.



## NATURE IN CAMBRIDGESHIRE

The following article is reprinted from Nature in Cambridgeshire, No. 30 (1988), pages 41-49, by kind permission of the Editorial Board and the authors. Its pagination has been altered for the purposes of this Bulletin. References to photographs which were printed with the original article inside the cover have been left in, but unfortunately it has not been possible to reproduce the photographs here.

Nature in Cambridgeshire is published annually in May, and its (usually) 64 pages contain articles on all aspects of the natural history of the old county of Cambridgeshire (vice-county 29), including vascular plant and bryophyte records. Formerly the journal of the Cambridgeshire and Isle of Ely Naturalists' Trust, it is now published privately by an Editorial Board chaired by Dr S.M. Walters; the Editor is Mr P.H. Oswald. Its future depends on enlarging its circulation. The annual subscription is £2.90 (including postage). Orders and enquiries should be addressed to Nature in Cambridgeshire, The Herbarium, Botany School, Downing Street, Cambridge CB2 3EA.

I thank Mr Oswald for providing me with a print-out of the original article. Ed.

## Fifty years of the Cambridge Bryological Excursions

P.W. Richards and H.L.K. Whitehouse

### 1938-1949

The Cambridge Bryological Excursions were first organised by P.W.R. and were originally intended for undergraduate and research students in the University Botany School. In 1938, when they began, he had begun to give an annual course of five lectures on bryophytes to students taking botany in Part 2 of the Natural Sciences Tripos and it seemed appropriate to give them an opportunity of learning to recognise the commoner mosses and liverworts in the field and of knowing something of their ecology. Brief typed notes on the distinguishing characters of the chief species were provided. From the beginning, the excursions were well attended and they have been held every year since 1938 without interruption even during the war. In recent years, as mentioned later, many of the participants have been interested people not connected with the university. Very regrettably, attendance by undergraduates has now ceased.

The first excursion was in the afternoon of 5 February 1938, a fine mild day. The party went by coach to Little Widgham Wood south of Newmarket. Those present, in addition to ourselves, included David Valentine (later Professor of Botany at Manchester), John Turner (later Professor at Melbourne University), Tom Tutin (later Professor at Leicester), Kathleen Jones (afterwards Mrs Turner) and other students, as well as Humphrey

Gilbert-Carter and Alex Watt of the Botany School staff. The excursion was bryologically rewarding (see inside back cover) and also enjoyable: H.L.K.W.'s diary even speaks of "frivolity", no doubt provoked by Humphrey's inimitable (and somewhat bizarre) sense of humour.

The second excursion took place a fortnight later. The weather was again fine but with a cold wind. Over fifteen of us cycled to Fleam Dyke. There was a third excursion on 5 March by coach to Icklingham in Suffolk. The party, which numbered twelve, walked over Temple Bridge to Cavenham Heath and the weather was once more fine. Among those present were the Professor of Botany, F.T. Brooks, and Jack Crosby.

These first excursions set the pattern for future years, with outings on Saturday afternoons to Little Widgham Wood, Icklingham or Tuddenham, and Fleam Dyke. The excursion to Little Widgham Wood on 18 February 1939 was very popular; the party of 24 included "Heff" (Dr E.F. Warburg, who had recently taken up a Lectureship at Bedford College, London), Val Chapman (later Professor at Auckland University, New Zealand), Kenneth Sporne, Jack Crosby, David Greenham, Peter Hume, "Tom" Riches and Ernest Hainsworth, as well as Humphrey Gilbert-Carter. For the Fleam Dyke excursion on 11 March the weather turned cold and wet, but ten of us were willing to cycle there. A newcomer in this party was Ben, Humphrey's huge sheep-dog. The Fleam Dyke excursion of the following year (1940) on 2 March was in bright sunshine. We took tea, which Humphrey always favoured, and during it he made one of his characteristic remarks: "I would like to drift to Denmark and sit and eat fish."

The wartime excursion to Widgham Wood on 1 March 1941 was one of the most memorable of the whole fifty years. Owing to snow, it had been postponed from 22 February. There was a party of 26, including "Heff", Humphrey and "Uncle Bill" (Dr W.B. Gourlay, an old friend of Humphrey's), "Rosy" (Dr Mariella Rosenberg) and Catherine Richards (aged three). The coach failed to appear for the return journey. It had also done that the previous year and we had had to walk a mile to catch it. This time we could not telephone because, as we discovered, the lines had been cut during a German air raid on Newmarket. Near Dullingham, after a three-mile walk during which young Catherine was carried on the shoulders of an undergraduate, we eventually met the coach, but it soon broke down and we had to wait for the 8.22 train at Dullingham station, delivering Catherine to her nearly frantic mother after 9 p.m. For Catherine, who had never before been in the country on a starlit night, it was an unforgettable adventure which afterwards had to be endlessly recounted as a bedtime story.

Probably the best-attended excursion of all was that to Widgham Wood in 1946 (23 February), when between thirty and forty people came, including Helen Doyle, C.E. Harrold and John Fincham (now Professor of Genetics at Cambridge). The coach again showed the effects of the war: it did not actually break down, but it vomited sparks on the return journey. That year it had snowed on 2 March and the Fleam Dyke excursion was postponed until a week later. It was still very cold, and the party, which included "Tom" Riches, Alan Burges (later Professor of Botany at Liverpool) and Max Walters, passed two-foot snowdrifts as they cycled from Fulbourn.

In some years, instead of visiting Widgham Wood, the need for a coach



was avoided by going to Kingston Wood (1943) or to Home Wood at Longstowe Hall (1944 and 1948), which were in those days accessible by train. Thus on 7 February 1948 we caught the 2.05 train, arriving at Old North Road station at 2.23, and assembled at the Fox Inn at Longstowe to meet Humphrey and others who had come by an earlier train. The return train left at 5.33.

### 1950-1988

In 1949 P.W.R. left Cambridge for Bangor and H.L.K.W. took over the running of the excursions. Outings were held to various sites within cycling distance of Cambridge towards the end of the Michaelmas Term and during the early part of the Lent Term, when the weather permitted. Coach excursions to more distant places were held, as in earlier years, in late February and early March. As many as ten excursions in a season were sometimes held, but of course very few in severe winters such as that of 1962/63, when the ground was frozen throughout January and February. In 1965 Jim Dickson helped with organising the excursions; he, Jeff Duckett, John Dransfield, Paul Adam, Brian Huntley, Oliver Rackham and Alan Outen all helped at various times. Co-organisers for many years have been John Birks, who assisted from 1968 to 1982, and Chris Preston, from 1978 to the present day. Bicycles and coaches as means of transport were abandoned about 1969 in favour of the departmental minibus and private cars.

From the 1970s the excursion notices were circulated to members of the British Bryological Society living in the neighbourhood of Cambridge, and gradually the address list has been enlarged to include B.B.S. members from as far away as Diss, King's Lynn, Stamford, Oxford, London and Maidstone, and also anyone with an interest in bryology, for instance in the Nature Conservancy Council at Peterborough, Norwich and Colchester and in the Institute of Terrestrial Ecology at Monks Wood. P.W.R. rejoined the excursions after his retirement to Cambridge. There were 25 of us at Buff Wood, East Hatley, on 29 October 1977, the first excursion to which he came.

After some forty years of good attendances by students, the number showing an interest in bryophytes declined to zero by the mid-1980s. This is presumably in part a reflection of the changes that have occurred in the content of biology courses. As a result the character of the excursions has changed. We now devote our time to recording rather than teaching. Also, since 1986, we have met on Saturday mornings at the site to be visited. This gives us longer in the field and has extended our radius. Previously, we could visit places within about 50 km of Cambridge, but now we can range to 70 km or more, visiting for example Ketton Quarry, Rutland, and Totternhoe Knolls, Bedfordshire. Among those who joined the excursions regularly as students were Peter Chamberlain, Donald Pigott, Michael Proctor, Geoffrey Halliday, Peter Grubb, Malcolm McFarlane, H.A.P. Ingram, Kay Luck, Catherine Richards (who as a child had taken part in the famous Widgham Wood excursion in 1941), Nan Anderson, Philip Lloyd, Sheila Megaw, Oliver Rackham, Jim Dickson, Stephen Waters, Mike Lock, Frances Bell, Jeff Duckett, Mark Hill, Michael Keith-Lucas, Hilary Lees, John Birks, John Dransfield, Andrew Malloch, Jacqui Paice, Leslie Rymer, Rachel Wood, Paul

Adam, Julia Robinson, Honor Gautby, Brian Huntley, Colin Prentice, Michael Fenner, Allan Hall, Alan Leslie, Chris Preston, Iain Robertson, Jon Watson, Alastair MacDougall, Caroline Pannell, Bill Peace, James Salmon, Keith Bennett, Laurence Clemons, Paul Kerslake, Andrew Lack, Quentin Cronk, Mary Edwards, Henry Lamb, Jonathan Sleath, Adrian Newton and Ian Turner. Anyone knowing those on this list might conclude, with some justification, that the excursions were something of a matchmaking establishment!

B.B.S. members and others who have joined the excursions at various times have included Ken Adams, George Bloom, Philip Bourne, Agneta Burton (Mariella Rosenberg's daughter), David Coombe, Paul Driver, Bill Fiddian, Bob Finch, Jack Gardiner, Mark Hill, Nick Hodgetts, Philip Jackson, Nick Jardine, Richard Libbey, Monica Milnes-Smith, Angela Newton, Alan Outen, Richard Pankhurst, Ron Porley, George Scott, Alex Smith, Phil Stanley, Robin Stevenson, Cliff Townsend and Sarah Webster.

## Results

In the course of the fifty years some 300 excursions have been held, the majority being in 'old' Cambridgeshire (vice-county 29), but about 32 in Suffolk, 19 in Huntingdonshire, 17 in Bedfordshire, 10 in Essex, four each in Hertfordshire and Northamptonshire and one each in Norfolk and Rutland. Over a hundred sites have been visited, of which nearly 70 were in 'old' Cambridgeshire. Those most often visited have been Madingley Wood (16 excursions), Fleam Dyke (15 or more), Cherry Hinton chalk-pit (14), the beechwood on the Gog Magog Hills (13) and the Devil's Ditch (13). Sites visited regularly outside Cambridgeshire (vice-county 29), besides Icklingham and Tuddenham in Suffolk, have included Monks Wood and Woodwalton Fen in Huntingdonshire, Flitwick Moor and Sandy Warren in Bedfordshire, Therfield Heath, Hertfordshire, and Chalkney Wood, Essex.

As already mentioned, the primary objective of the excursions, until recently, was to teach students how to recognise the common bryophytes. For the organisers there was little opportunity to search for uncommon species. Nevertheless, 37 new vice-county records for Cambridgeshire (including first records for a century or more) have been made on the excursions; these are listed in Table 1. Many new records have also been made for neighbouring vice-counties. An outstanding find made on one of the Suffolk excursions was the discovery by Reg Parker on 7 March 1953 of the rare liverwort *Riccia beyrichiana* Hampe ex Lehm. on Roper's Heath, between Tuddenham and Cavenham Heaths. It is not known within 250 km of this site. It has been refound on subsequent bryological excursions to the same locality by David Coombe (7 March 1959) and Alan Leslie (1 March 1975). Another exciting discovery was the subterranean saprophytic liverwort *Cryptothallus mirabilis* Malmb., found at Flitwick Moor by John Dransfield on 11 March 1967.

In addition to new vice-county records, many other interesting finds have been made. Some of those in 'old' Cambridgeshire are listed in Table 2. Sometimes, three or more exciting finds have been made on a single excursion, for example on 5 November 1966 and 23 February 1985, as the tables show.

Some of the sites that we have visited regularly over the fifty years have been much altered during that time. This has sometimes been by direct human interference; for example, an airfield was built on Cavenham Heath during the war and destroyed some of the most interesting areas including a small *Sphagnum* bog. There have also been changes for other reasons. With the decline in the number of rabbits as a result of myxomatosis, scrub growth has overgrown much of the chalk grassland on Fleam Dyke, on the Devil's Ditch and along the Roman Road on the Gogs. This has led to much increased rarity of many chalk grassland species. Some compensation has been the discovery on elders in the Devil's Ditch of several rare epiphytes that need both light and shelter (see Tables 1 and 2).

There has been a marked decline in the abundance of *Seligeria calcarea* (Hedw.) B., S. & G. and *Pterygoneurum ovatum* (Hedw.) Dix., once frequently found on excursions to Cherry Hinton chalk-pit and other calcareous sites. The much rarer *P. lamellatum* has also declined. The earliest records of *P. ovatum* in the county, dating from more than 150 years ago, are from mud walls, for example in Parker's Piece Lane, Cambridge. Could these *Pterygoneurum* species require nitrogen-rich calcareous soil and have declined with the metalling of roads and the loss of horse-drawn vehicles?

Some species have increased in frequency, for example *Lepidozia reptans* (see Table 2), which was first found in the county in 1965 (by S.J.P. Waters on stumps in Hayley Wood). The increase may relate to a greater prevalence of decaying wood. Two mosses probably introduced to Britain from the Southern Hemisphere have spread rapidly in Britain: *Orthodontium lineare* Schwaegr. was first recorded in Cambridgeshire in 1947 (by P.W.R. on a pine stump in South Lodge Plantation, Croxton) and now occurs on tree bases, stumps and logs in nearly all the woods, and *Campylopus introflexus*, first found in 1965 (by J.M. Lock on an old *Molinia* tussock in carr in Verrall's Fen, Wicken Fen), is likewise spreading in non-calcareous habitats (see Table 2).

All who have come regularly on the excursions have been enthusiastic about them. It is hoped that the outings may long continue.

We thank Mrs G. Crompton and Mr C.D. Preston for their helpful criticisms of the manuscript of this paper.

### Postscript

On 6 February 1988 an excursion was held in bright sunshine to Little and Great Widgham Woods by permission of the owner, Mr W.J. Gredley, to commemorate the first excursion fifty years ago, which had been to this locality. Unlike that occasion, transport was by cars rather than by coach. A dozen people came, including Peter Wanstall (President of the British Bryological Society), David Coombe, Oliver Rackham, Mark Hill, Chris Preston and both authors. Greetings for this special occasion had been received from Jean Paton, Alex Smith and Agneta Burton.

Both woods had been planted with conifers, Little Widgham Wood in 1957-60 and Great Widgham Wood in 1954-58, but nevertheless most of the bryophytes recorded on the first excursion were refound. Interestingly, the mosses *Orthodontium lineare* and *Campylopus introflexus*, which are believed to be introductions to Britain (see above), were found on stumps as soon as

we entered Little Widgham Wood. They had not reached this part of England fifty years ago (first Cambridgeshire records being in 1947 and 1965 respectively). The outstanding find was *Ulota crispa* var. *norvegica*, discovered by Mike Lock about 1 m from the ground on a coppiced ash trunk in Great Widgham Wood (52/665552). This was only the second record (see Table 1) in the vice-county this century of this pollution-sensitive species. During lunch Robin Stevenson produced a large iced cake made by his wife. It was suitably inscribed for the occasion and bore a fruiting *Bryum*(?) in icing in one corner. P.W.R. was photographed in the act of cutting it (see inside front cover). Robin also distributed champagne and Peter proposed toasts to us on achieving a half century of excursions.

**Table 1: New vice-county records for 'old' Cambridgeshire made on the excursions, with some renewed finds, after an interval of a century or more, also included**

- Polytrichum formosum* Hedw. Little Widgham Wood, P.W.R., 5.2.1938: first record since Henslow found it at Gamlingay in 1829.
- Chiloscyphus pallescens* (Ehrh. ex Hoffm.) Dum. On damp soil in ride, Little Widgham Wood, P.W.R., 18.2.1939.
- Weissia sterilis* Nicholson In chalk grassland, Fleam Dyke, H.L.K.W., 2.3.1940.
- Leucobryum glaucum* (Hedw.) Ångstr. In old coppiced stump, Little Widgham Wood, H.L.K.W., 1.3.1941.
- Eurhynchium pumilum* (Wils.) Schimp. On shady clay bank on edge of Kingston Wood, D.G. Catcheside, T.G. Tutin & P.W.R., 20.2.1943.
- Eurhynchium swartzii* (Turn.) Curn. var. *rigidum* (Boul.) Thér. In chalk grassland, Fleam Dyke, P.W.R., 23.2.1946.
- Pleuroidium subulatum* (Hedw.) Lindb. Abundant on bare clay in Little Widgham Wood, P.W.R., 9.3.1946.
- Fissidens pusillus* (Wils.) Milde var. *tenuifolius* (Boul.) A.J.E. Smith On bricks in old railway cutting at Babraham, D.E. Coombe & M.C.F. Proctor, 10.2.1951.
- Rhynchostegiella tenella* (Dicks.) Limpr. With last: first record since Henslow, 1829.
- Cirriphyllum crassinervium* (Tayl.) Loeske & Fleisch. On tree stump by Fishpond, Madingley Park, 52/395605, H.L.K.W., 24.2.1951.
- Thuidium philibertii* Limpr. In old lawn on chalk, Hildersham Hall, 52/542483, C.D. Pigott & M.C.F. Proctor, 3.3.1951; refound by C.D. Preston *et al.*, 9.2.1980.
- Cephaloziella hampeana* (Nees) Schiffn. In turf on sandy soil, Hildersham Furze Hills, M.C.F. Proctor, 1.3.1952.
- Hypnum jutlandicum* Holmen & Warncke On Hildersham Furze Hills, H.L.K.W., 1.3.1952.
- Scleropodium tourettii* (Brid.) L. Koch Under beech, Hildersham Hall, a student & M.C.F. Proctor, 7.2.1953.
- Bryum klinggraeffii* Schimp. In arable field, Trumpington, 52/439557, H.L.K.W., 1.12.1956.
- Barbula acuta* (Brid.) Brid. In Cherry Hinton chalk-pit, 52/485559, K. Stroude & H.L.K.W., 9.2.1957.
- Weissia controversa* Hedw. With *Fissidens cristatus* Wils. ex Mitt., north-east of coprolite pit, Stow cum Quy Fen, D.E. Coombe, 16.2.1957: first record since Henslow found it at Gamlingay in 1830.

- Brachythecium salebrosum* (Web. & Mohr) B., S. & G. On fallen oak trunk, grounds of Hildersham Hall, G. Halliday, 1.3.1958.
- Brachythecium populeum* (Hedw.) B., S. & G. In chalk grassland, Devil's Ditch, 52/619615, J. Harding, 5.3.1960.
- Racomitrium heterostichum* (Hedw.) Brid. Damp clinker on side of sewage bed, Madingley Park, 52/391605, S.J.P. Waters, 11.2.1961.
- Racomitrium lanuginosum* (Hedw.) Brid. With last.
- Racomitrium ericoides* (Brid.) Brid. With last two: determined by M.O. Hill: see *Rep. Br. Bryol. Soc.*, **43** (1984): 24.
- Cephalozia connivens* (Dicks.) Lindb. On stump, Hayley Wood, M.O. Hill, 19.2.1966.
- Aloina brevirostris* (Hook. & Grev.) Kindb. In Cherry Hinton chalk-pit, 52/485559, H.J.B. Birks & J.G. Duckett, 5.11.1966.
- Leiocolea badensis* (Gott.) Jorg. Wet chalk in Cherry Hinton chalk-pit, 52/485559, H.J.B. Birks, 5.11.1966.
- Lophozia perssonii* Buch & S. Arn. With last.
- Lophozia excisa* (Dicks.) Dum. On clinker of railway, Hayley Wood, J.G. Duckett & H.L.K.W., 10.2.1968.
- Calypogeia muellerana* (Schiffn.) K. Mull. On base of royal fern *Osmunda regalis* tussocks, 'water garden', Cambridge Botanic Garden, 52/453571, H.J.B. Birks, 3.2.1973.
- Isopterygium elegans* (Brid.) Lindb. On sandy bank, White Wood, Gamlingay, H.L.K.W., 10.11.1973.
- Sphagnum recurvum* P. Beauv. var. *mucronatum* (Russ.) Warnst. At Wicken Fen, H.J.B. Birks, 8.2.1975.
- Hylocomium brevirostre* (Brid.) B., S. & G. Under birch trees, Wicken Fen, 52/551702, P. Adam, 8.2.1975. Later, it was found to have been collected in the same area by A.C. Leslie in 1974.
- Campylopus fragilis* (Brid.) B., S. & G. On rotting log, Chippenham Fen, 52/648695, P. Adam, 5.2.1977.
- Pseudephemerum nitidum* (Hedw.) Reim. Wet slope in rough meadow, Mill Hill, south of Gamlingay, 52/233513, P. Adam *et al.*, 20.10.1977.
- Nardia scalaris* S. Gray With last, S.D. Atkins *et al.*
- Hygrohypnum luridum* (Hedw.) Jenn. On gravel path in woodland, Longstowe Hall, 52/309556, G. Bloom, 28.10.1978.
- Ulota crispa* (Hedw.) Brid. var. *norvegica* (Groenwall) Smith & Hill On *Salix* stems near ground level in fen carr near brick-pits, Wicken Fen, 52/560707, C.D. Preston, 18.2.1984.
- Ulota phyllantha* Brid. On bark of old elder in Devil's Ditch 52/613619, P.W.R., 8.3.1986.

**Table 2: Interesting finds made on the excursions in 'old' Cambridgeshire, additional to the new vice-county records**

- Fissidens exilis* Hedw. On bare clayey soil, Little Widgham Wood, P.W.R., 9.3.1940: third record for the vice-county.
- Lejeunea cavifolia* (Ehrh.) Lindb. On stumps, Little Widgham Wood, P.W.R., 23.2.1946: third record for the vice-county.
- Aloina aloides* (Schultz) Kindb. var. *aloides* On chalk on floor of eastern chalk-pit, Cherry Hinton, 52/485559, H.L.K.W., 25.11.1950: first record for the vice-county since

- Rhodes, 1911.
- Entodon concinnus* (De Not.) Paris In lawn, Hildersham Hall, 52/542483, C.D. Pigott & M.C.F. Proctor, 3.3.1951. In lawn, Wandlebury, 52/494534, D. Kingston, 2.2.1957: not far from where the plant was discovered along the Roman road by P.W.R. in 1932.
- Cinclidotus mucronatus* (Brid.) Mach. At base of tree by ditch, Hildersham Hall, M.C.F. Proctor, 7.2.1953: second record for the vice-county, the first being by P.W.R. in 1941 on trees by the River Kennett near Red Lodge.
- Cryphaea heteromalla* (Hedw.) Mohr On branch of elder, Hildersham Hall, R.E. Parker, 7.2.1953: second record for the vice-county this century, the first being near Babraham by P.W.R. in 1942. On old elder, Chippenham Fen, 52/651692, H.L.K.W., 25.2.1961. On elder in scrub, Devil's Ditch, 52/626606, C.R. Stevenson, 5.2.1983: first record for 22 years of this pollution-sensitive species.
- Climacium dendroides* (Hedw.) Web. & Mohr At eastern end of Madingley Wood, 52/402596, Mrs J.G. Hughes, 10.3.1956: first record from Madingley Wood since Relhan, 1820, but not seen since 19.1.1957. In carr, Verrall's Fen, Wicken Fen, 52/552702, L. Clemons, 24.2.1979: 49 years after it was last found (by P.W.R.) at Wicken Fen.
- Herzogiella seligeri* (Brid.) Iwats. On rotten wood, Chippenham Fen, 52/648695, H.L.K.W., 25.2.1961: second record for the vice-county, the first being by P.W.R. in 1946 in a plantation near Madingley.
- Scorpiurium circinatum* (Brid.) Fleisch. & Loeske On rockery stones introduced from Killarney to the grounds of Hildersham Hall, 52/542483, J.M. Lock, 4.3.1961.
- Ephemerum recurvifolium* (Dicks.) Boul. In arable field, Madingley Hall, 52/408596, O. Rackham, 27.1.1962.
- Brachythecium populeum* (Hedw.) B., S. & G. In lawn, Wandlebury, 52/494534, M.O. Hill, 30.1.1965: second record for the vice-county.
- Cephaloziella hampeana* (Nees) Schiffn. On decaying wood, Gamlingay Wood, H.J.B. Birks, 6.11.1965. On clinker of railway near Hayley Wood, J.G. Duckett, 19.2.1966: second and third records for the vice-county.
- Tortula papillosa* Wils. On elder in lower chalk-pit, Cherry Hinton, 52/483557, H.J.B. Birks, 5.11.1966. Refound after 23 years on elders in Underwood Hall chalk-pit, Westley Waterless, 52/613569, C.D. Preston, 5.2.1983.
- Lophozia perssonii* Buch & S. Arn. On crumbling chalk soil in old railway cutting, Fleam Dyke, 52/544546, J. Dransfield, 11.2.1967: second locality in the vice-county.
- Barbula acuta* (Brid.) Brid. At Stow cum Quy Fen, J.G. Duckett, 17.2.1968.
- Pterygoneurum lamellatum* (Lindb.) Jur. In Cherry Hinton chalk-pit, H.J.B. Birks, 28.11.1970.
- Lepidozia raptans* (L.) Dum. On decaying wood, Papworth Wood, D.E. Coombe, 31.10.1971. On rotten wood, Fulbourn Nature Reserve, D.E. Coombe, 5.2.1972. On decayed log, Jerusalem Wood, Chippenham Fen, 52/650690, G.A.M. Scott, 14.2.1976: second, third and fourth records for the vice-county.
- Tortula latifolia* Bruch ex Hartm. On asphalt path near bird sanctuary, Adams Road, Cambridge, 52/437585, H.L.K.W., 27.1.1973. This species usually occurs in the flood zone of rivers, but has been found on asphalt away from water in several places in England and Wales.
- Orthotrichum lyellii* Hook. & Tayl. On beech, Wandlebury, 52/495530, H.J.B. Birks, 10.2.1973: first record since Rhodes, 1911.
- Tortula vahliana* (Schultz) Mont. On chalk slope under bushes, Harlton clunch-pit, 52/390520, H.J.B. Birks, 17.2.1973. On chalk bank of earthwork, Wandlebury,

52/492534, H.J.B. Birks, 8.11.1975. On chalk bank in old chalk-pit, Bassingbourn, 52/329428, P.W.R., H.L.K.W. *et al.*, 2.2.1985.

*Trichostomum brachydontium* Bruch In chalk grassland, Fleam Dyke, H.J.B. Birks, 3.11.1973: second locality in the vice-county.

*Leiocolea badensis* (Gott.) Jorg. On damp chalk soil, Fleam Dyke, 52/543545, J.C. Gardiner, 3.11.1973. Near chalk spring, Nine Wells, Great Shelford, 52/461541, C.M. Pannell, 5.11.1977: second and third records for the vice-county.

*Campylopus brevipilus* B., S. & G. In carr south of Cross Dyke, Wicken Fen, 52/551702, H.J.B. Birks *et al.*, 8.2.1975: second record for the vice-county.

*Campylopus introflexus* (Hedw.) Brid. On clinker of railway, Hayley Wood, B. Huntley, 15.2.1975. On log in woodland, Hildersham Hall, J.D. Sleath, 9.2.1980. On decayed stump in woodland, Sawston Hall, 52/492488, N. Hodgetts, 27.10.1984.

*Nowellia curvifolia* (Dicks.) Mitt. On decaying log, Forty Acre Wood, Chippenham Fen, 52/653694, B. Huntley & H.L.K.W., 22.2.1975: second locality in the vice-county.

*Metzgeria fruticulosa* (Dicks.) Evans On elder in scrub in Devil's Ditch, 52/58-64-, P. Adam, 27.2.1977: second record for the vice-county.

*Brachythecium salebrosum* (Web. & Mohr) B., S. & G. In carr, Verrall's Fen, Wicken Fen, 52/552702, J.C. Gardiner, 24.2.1979. On much-decayed fallen tree trunk, Forty Acre Wood, Chippenham Fen, 52/652696, M.O. Hill, 6.12.1986: third and fourth records for the vice-county.

*Riccia rhenana* Lorbeer Refound at Madingley brick-pits after an interval of 18 years, 52/404615, P.W.R., 10.11.1979.

*Tortella inflexa* (Bruch) Broth. On chalk stones on the Fleam Dyke, C.D. Preston, 2.2.1980: second locality in the vice-county.

*Ptilidium pulcherrimum* (G. Web.) Vainio On bark of ash, Knapwell Wood, 52/330606, C.D. Preston, 16.2.1980: fourth record for the vice-county and the first for 14 years.

*Pleurozium schreberi* (Brid.) Mitt. On decaying blackthorn log, Elsworth Wood, 52/312617, J.A. Hawkings, 6.2.1982: second record for a boulder clay wood in the vice-county.

*Pottia caespitosa* (Bruch ex Brid.) C. Müll. In chalk grassland, Fleam Dyke, 52/544545, R.A. Finch, 11.2.1984: second record for the vice-county.

*Grimmia trichophylla* Grev. On horizontal concrete surface near ground level on north side of Sawston Hall, 52/488491, I.M. Turner, 27.10.1984: first record in the vice-county for 24 years.

*Trichostomopsis umbrosa* (C. Müll.) Robins. On steep bank beside chalk spring, Nine Wells, Great Shelford, 52/462542, H.L.K.W., 3.11.1984. With *Tortula vahliana* on chalk bank in old chalk-pit, Bassingbourn, 52/329428, P.W.R. & H.L.K.W., 2.2.1985: first records of *Trichostomopsis umbrosa* in semi-natural habitats in the vice-county.

*Orthotrichum cupulatum* Brid. On horizontal tombstone, Croxton churchyard, 52/252592, A.E. Newton, 23.2.1985: second localised record for the vice-county and the first for 30 years.

*Leucodon sciuroides* (Hedw.) Schwaegr. Refound in Croxton churchyard after an interval of 51 years, 52/252592, C.D. Preston, 23.2.1985: first find of this pollution-sensitive species in the vice-county for 32 years.

*Platygyrium repens* (Brid.) B., S. & G. With *Metzgeria fruticulosa* on horizontal willow trunk above swampy ground, Croxton Park, 52/255592, C.D. Preston, 23.2.1985: second record for *P. repens* in the vice-county.

*Aloina brevirostris* (Hook. & Grev.) Kindb. Refound in Cherry Hinton chalk-pit, R.A. Finch, 16.3.1985: this is its only Cambridgeshire locality.

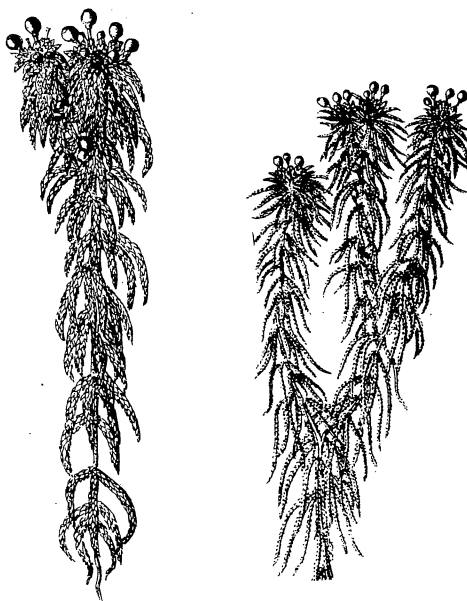
# THINGS MOSS IS USED FOR.....

Robin Stevenson, upon browsing through a copy of Dr Johnson's Dictionary the other day came across the following reference under the word MUMMY: " ....Mummy has been esteemed resolvent and balsamick; and besides it, the skull, and even the moss growing on the skulls of human skeletons, have been celebrated for anti epileptick virtues....."

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Under the heading "Peat bogs yield a happier nappy" the Sunday Times reported on 6 November, 1988 "A moss which grows abundantly in Northern Ireland is being exploited by two school girls to make more efficient nappies." It seems that the offending agent in nappy rash is ammonia, and that Sphagnum can be used to counteract it. Handfuls of the moss are dried and powdered and then put inside the layers of a disposable nappy. Sphagnum peat has been shown to have an identical ability to neutralize and absorb, and has the advantage that "as it is very plentiful it costs £90 a tonne compared with £400 for wood pulp, which is becoming scarce." The girls' project was chosen by the Design Council from 261 entrants, says the article, as a finalist in the Toshiba Year of Invention Competition.

This seems not so much an invention as a re-application of earlier practices, now perhaps forgotten.



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