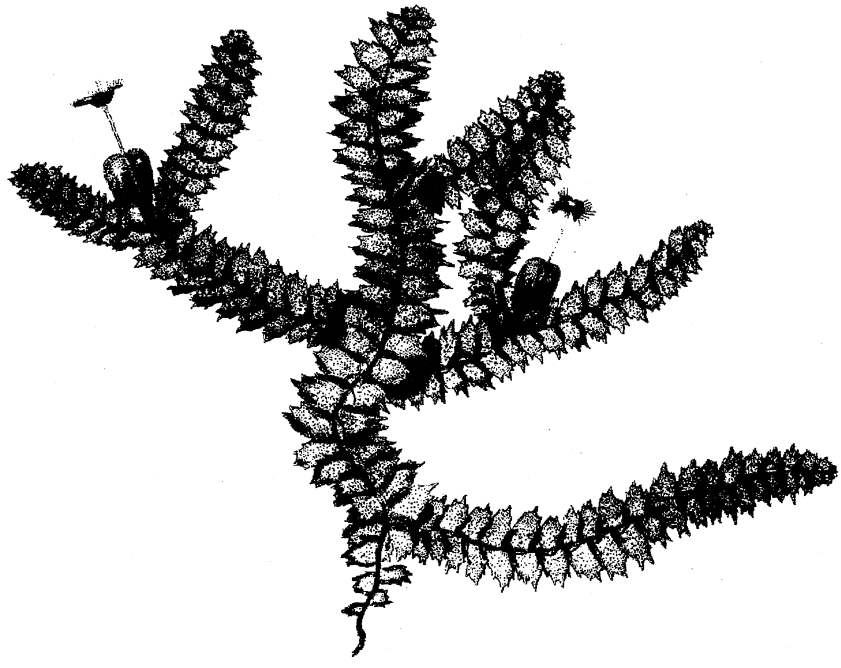
BULLETIN OF THE BRITISH BRYOLOGICAL SOCIETY

NUMBER 69 FEBRUARY 1997 ISSN 0142-3169



Jungermannia Hutchinsiae

***Edited by* A.R. Perry**

BRITISH BRYOLOGICAL SOCIETY
CARDIFF

BRITISH BRYOLOGICAL SOCIETY

The British Bryological Society exists to promote the study of mosses and liverworts. The Society was constituted in its present form in 1923, replacing the Moss Exchange Club founded in 1896.

Two Field Meetings, each usually of a week's duration are held every year in districts of bryological interest. In addition two weekend meetings are held in the autumn, one for the Annual General Meeting, the presentation of papers and fieldwork, and the other for practical instruction in the examination and identification of bryophytes.

Members of the Society are entitled to receive the Society's *Journal* and its *Bulletin* free of charge, to borrow books, periodicals and reprints from the Society's library, to consult or borrow specimens from the Society's herbarium, and to consult the Society's panel of referees for assistance in the identification of specimens.

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PROCEEDINGS OF THE BRITISH BRYOLOGICAL SOCIETY

SPRING FIELD MEETING, DOLGELLAU, 1996

Dolgellau was chosen as a meeting venue during the Society's centenary year as it was here in 1922 that members of the two sections of the Moss Exchange Club agreed to unite and form the British Bryological Society. The groundwork leading to the union had been prepared by Miss Eleonora Armitage on behalf of Section I (the 'experts') and by Mr Daniel A. Jones on behalf of Section II (the 'beginners') for 'the momentous event of 1922' (Armitage, 1944). In the event, some twelve members gathered on two occasions at the Grammar School in Dolgellau during a meeting in early August 1922. They resolved that the new BBS should come into being on 1 January 1923, with H.N. Dixon elected as President

and D.A. Jones nominated as Secretary. A proposal to admit foreign members was carried unanimously. The annual subscription was set at five shillings.

Since 1922 the Society has grown and flourished (Richards, 1983), and the involvement of over 50 participants during the 1996 spring meeting, based at the Royal Ship Hotel in Dolgellau, is testament to its continuing good health. Numbers joining the excursions varied from day to day, and were highest during the middle part of the meeting. Four honorary members of the Society, Dr M.C.F. Proctor, Dr A.J.E. Smith, Dr E.V. Watson and Dr H.L.K. Whitehouse, were present for all or part of the meeting. Most participants were from the British mainland, but it was also a pleasure to welcome Alain Vanderpoorten from Belgium.

All excursions during the main part of the meeting were in Merioneth (VC 48) where the bryophyte flora is extremely well recorded, mainly due to the work of two local experts (see Richards, 1979; Hill, 1988). D.A. Jones (1861-1936) of Harlech found many species new to Merioneth and north Wales, and bryological exploration has been continued more recently by Peter Benoit based in Barmouth. Peter was able to join the meeting for several excursions, and his detailed knowledge of the sites enabled us to see various interesting species which may otherwise have been overlooked.

THURSDAY 11 APRIL

Arthog Bog (SH 6314)

In the morning we visited Arthog Bog which is a small and rather degraded raised bog on the south side of the Mawddach estuary. The mire surface has been modified by drainage, burning and peat extraction, but the locality is a Site of Special Scientific Interest, and management is being developed to restore more favourable bog conditions in co-operation with the owners. Despite the adverse human impact, there are several rare vascular plant species on the bog, including *Hypericum undulatum* which was noted by a drainage channel. It is less well known for its bryophytes, although there is a small population of *Pallavicinia lyellii* and Peter Benoit unearthed scattered thalli among litter around the base of *Molinia* tussocks in one part of the site. Several common bog *Sphagnum* spp. were examined, together with a variety of associated hepatics, including *Cephalozia lunulifolia*, *Odontoschisma denudatum*, *O. sphagni*, *Mylia anomala* and *Riccardia latifrons*. *Splachnum ampullaceum* was noted on decaying cow dung. Unfortunately we did not re-find *Cephalozia leucantha*, previously recorded here at one of its few Welsh localities.

Arthog Ravine (SH 6414)

The afternoon's excursion was to a nearby wooded ravine which is also an SSSI. The ravine is north-facing, and has a moderate Atlantic flora; substrata are mostly acidic but there are also base-rich outcrops and boulders, with overall a fairly rich bryophyte assemblage. The water level in the main stream was unusually low, so that rocks in and by the water course were relatively accessible. We were thus able to observe, at close quarters, the exceptional abundance of *Jubula hutchinsiae* in the Arthog ravine; rather than hiding under dripping rock overhangs, as at many of its north Wales localities, *Jubula* here forms large patches on relatively exposed rock surfaces and is locally frequent in a long section of the ravine. Alan Hale turned up a small quantity of *Adelanthus decipiens*, and Roy Perry found *Lepidozia pearsonii*. Other taxa recorded included *Anastrepta orcadensis*, *Fissidens pusillus*, *Grimmia hartmanii* and *Hygrohypnum eugyrium*. The ferns *Dryopteris aemula* and *Hymenophyllum tunbrigense* were also observed.

FRIDAY 12 APRIL

Coed y Rhygen National Nature Reserve (SH 6836)

A much larger group assembled at Coed y Rhygen where we were greeted by the NNR warden, Doug Oliver. The reserve is a rocky north-facing oakwood on the west side of Llyn Trawsfynydd reservoir. It has one of the most impressive Atlantic woodland bryofloras in southern Britain, yet this was not appreciated until 1964 when it was visited by Derek Ratcliffe. Not only is there a long list of oceanic taxa, including several rarities, but certain species such as *Adelanthus decipiens*, *Bazzania trilobata*, *Lepidozia cupressina* and *Plagiochila punctata* grow luxuriantly and in considerable abundance. One of the advantages of visiting Coed y Rhygen on a wet day, as we did, is that members of the Atlantic community appear at their best: fully turgid and relishing the mild and moist conditions. A good species list was compiled, including *Dicranodontium denudatum*, *Dicranum fuscescens*, *D. scottianum*, *Hylocomium umbratum*, *Jamesoniella autumnalis*, *Plagiochila killarniensis* and *Plagiothecium laetum*. Weatherwise, it was not a good day to search for very small plants, although Peter Benoit located a little *Sematophyllum demissum* on sheltered rocks and Marcus Yeo found patches of *Leptoscyphus cuneifolius* on an oak tree. The latter is here at one of its two known sites in Wales, as is *Plagiochila atlantica*, several good patches of which were found by Peter Martin on steep rock faces in one part of the woodland after much searching by various members of the party.

On our way back to Dolgellau, some of the group visited a flush complex on a hillside to the east of Pont y Grible, south of Trawsfynydd, at SH 7030. Various people had expressed a wish to see *Sphagnum imbricatum* ssp. *affine* and Peter Benoit was able to relocate several patches growing in a wet acid flush by the roadside. Peter Martin recorded *S. platyphyllum* by the side of a ditch.

When the organizers returned Peter Benoit home at the end of the day he kindly showed us two Barmouth specialities, *Campylopus polytrichoides* and *Riccia nigrella*. The *Riccia* has persisted in Barmouth since it was first recorded, new to Britain, by J. Ralfs in 1843.

SATURDAY 13 APRIL

Morfa Dyffryn National Nature Reserve (SH 5525)

Morfa Dyffryn and Morfa Harlech are a pair of extensive sand dune systems situated near Harlech. Both are NNRs and Morfa Dyffryn, which we visited, is the more southerly of the two. There is a good list of specialist dune slack bryophytes, with several rarities, recorded from Morfa Dyffryn, but the slacks we visited were a little disappointing and among the species we did not re-find were *Amblyodon dealbatus*, various uncommon *Bryum* spp., *Moerckia hibernica* and *Riccia cavernosa*. The best open slacks were rather dry and this may account in part for a poor showing among the mosses and liverworts. Nevertheless, *Petalophyllum ralfsii* was seen in a number of slacks, but always in small quantity and with a rather scattered distribution. Among additional species recorded were *Bryum dunense*, *Homalothecium lutescens* and *Tortella flavovirens*. Extensive stands of pleurocarps were examined and debated in two large slack complexes; Michael Proctor identified *Drepanocladus sendtneri* and *Scorpidium cossonii*, and other species recorded include *Calliergon cuspidatum*, *Campylium elodes* and *Cratoneuron filicinum*.

Figra Mine (SH 6619)

In the afternoon, various small groups visited Figra Mine on the hillside above Bontddu on the north side of the Mawddach estuary. It is an old disused copper mine and the probable

locality for *Cephaloziella nicholsonii* collected by D.A. Jones in 1923. *C. nicholsonii* was unfortunately not re-found, but patches of *C. massalongi* were seen on damp rocks near the entrance to the old mine workings and elsewhere by Jonathan Sleath and others. There were also some fine patches of *C. stellulifera* on stony metalliferous soil. A large population of *Leucobryum glaucum* with many cushions bearing sporophytes was admired in an oakwood below the mine. A few small patches of *Grimmia arenaria* were spotted on a wall by the footpath leading to the mine.

Other localities

A few participants visited Llanelltyd Bridge (SH 7119) later in the day to pay their respects and photograph the well-known population of *Grimmia arenaria*. A separate small group visited Coed Ganllwyd NNR (SH 7224) to admire the relatively large colonies of *Sematophyllum demissum* which persist here; *Campylopus setifolius*, *Drepanolejeunea hamatifolia* and *Sphagnum imbricatum* ssp. *affine* were additional attractions. Another splinter group went to Coed Crafnant, a North Wales Wildlife Trust Reserve in the Artro valley (SH 6128), and recorded *Leucobryum juniperoideum* and *Tritomaria exsecta* among a range of commoner woodland species. All of these localities were also visited by small parties on other days of the meeting.

SUNDAY 14 APRIL

Cwm Cywarch (SH 8419)

A large party set off in the morning in several cars for Cwm Cywarch in the Aran mountains. The weather was wet and quite cold which was a pity as this was the highest altitude locality (reaching about 700m) of the meeting. The objective was to work the extensive cliffs and crags in Cwm Cywarch. The majority of the group visited the northern part of the cwm, recording on stream-side rocks and higher ground at Creigiau Camddwr. A good range of the more common bryophytes found on acid rocks in the uplands of north Wales was examined, including frequent *Gymnomitrion crenulatum* and *G. obtusum*, together with *Andreaea alpina*, *Dryptodon patens*, *Marsupella sprucei* and a number of *Racomitrium* taxa. Species recorded on base-rich rocks include *Anoectangium aestivum*, *Grimmia funalis*, *Isothecium myosuroides* var. *brachythecioides* and *Schistidium strictum*. A smaller and more energetic group covered a large area of Craig Cywarch, and made a more impressive list, including *Barbula ferruginascens*, *Grimmia torquata*, *Hedwigia integrifolia*, *Rhabdoweisia crenulata* and *Tetraplodon mnioides*.

Torrent Walk (SH 7518)

Some of the party left Cwm Cywarch early and visited Torrent Walk, a well-known wooded ravine to the east of Dolgellau. A good list of woodland bryophytes was recorded, but *Rhytidiadelphus subpinnatus* (which has been seen here in recent years) was not re-found. On a separate visit to Torrent Walk earlier in the week, Nick Hodgetts and Ron Porley found *Radula voluta*.

MONDAY 15 APRIL

Cwm Bychan (SH 6431) and the Roman Steps (SH 6530)

Situated at the head of the heavily wooded Artro valley, Cwm Bychan has a stand of oak-birch woodland through which a path leads to the Roman Steps (Bwlch Tyddiad) and the heather-clad Rhinog hills. The area is characterized by wild and rugged scenery and is reminiscent of hill country in western Scotland. The weather was mild with periodic light

drizzle, and we followed the path out of the car park, soon noting *Dicranodontium denudatum* and *Hylocomium umbratum* in the woodland and *Sphagnum molle* in damp grassland. Most of the day was spent investigating the rocks and humid heathy vegetation by the Roman Steps in the Rhinog National Nature Reserve. Here a distinctive leggy heath community has developed over steep boulder-strewn ground, with a luxuriant bryophyte layer in which *Sphagnum capillifolium*, *S. quinquefarium* and other *Sphagnum* spp. are extensive. *Bazzania tricrenata* and *Herbertus aduncus* were both frequent, and other Atlantic hepatics observed include *Anastrepta orcadensis* and *Lepidozia pearsonii* (with bulbils); a few patches of *Ptilium crista-castrensis* were also admired. This is the only British locality for *Gymnocolea acutiloba* which was first detected here by D.A. Jones in 1911. It has often been re-found, and after our group had seen the first signs of *Gymnocolea* at lunch time, several good patches of *G. acutiloba* were observed on sheltered surfaces of boulders in NE-facing block scree. Other notable plants recorded in the rich welter of bryophytes included *Anastrophyllum minutum*, *Campylopus setifolius*, *Grimmia torquata* and *Hypnum callichroum*. When setting out for the Roman Steps, we had hopes but no great expectations of re-finding *Glyphomitrium daviesii*, *Lophozia longidens*, *Sphagnum strictum* or perhaps even *Bartramidula wilsonii*; sadly we had no success. However, our efforts were rewarded by the discovery of *Campylopus brevipilus* on slabby SE-facing outcrops. This species is surprisingly rare in north Wales and had not been recorded in Merioneth for over 90 years.

Before returning to Dolgellau, the organizers took Cliff Townsend to try to relocate *Amblystegium saxatile* at its second British locality in Cwmnantcol. The old peat cutting in which *A. saxatile* had been seen in 1987 was overgrown and now much wetter, and despite rooting around in litter at the base of *Molinia* tussocks, we were unable to re-find this rare and elusive moss. Material which looked promising when viewed through a rain-soaked hand-lens in the field proved to be either *A. riparium* or *Campylium stellatum* upon microscopic examination.

TUESDAY 16 APRIL

Hermon Copper Bog (SH 7425)

In the morning of the final day of the meeting a small remnant group visited Hermon Copper Bog which is a SSSI situated within the extensive Coed y Brenin conifer plantations. We were introduced to the site by Martin Garnett of Forestry Enterprise who gave an account of the highly unusual copper-enriched peat which in the past had been exploited to obtain copper. Higher plant metallophytes are represented by Cu-tolerant forms of *Armeria maritima*, *Minuartia verna* and *Silene maritima*. Specialist bryophytes are restricted to *Cephaloziella massalongi* which was seen in several places, characteristically on steep, moist soil banks, shaded by overhanging soil slumps, by the outflow stream running through the bog. The mire flora was also examined, and the bog surface has some large *Sphagnum* tussocks (mostly *S. capillifolium* and *S. papillosum*), with associated *Cephalozia connivens*, *Kurzia pauciflora*, *Odontoschisma sphagni*, *Riccardia latifrons* and several other bog liverworts. In a flushed zone, there were some nice patches of *Sphagnum teres*, which had not been recorded elsewhere during the meeting.

Craig y Benglog (SH 8023)

The final excursion was to the lightly wooded scree and crags of Craig y Benglog, which is part of a SSSI situated to the north of Rhydymain. The site is south-east facing, with variable shade from patchy oak-ash woodland, and there is some base-rich rock. The latter have extensive patches of *Neckera crispa* (in some cases with sporophytes), *Pterogonium gracile*,

Tortella tortuosa and other calcicoles. Additional species recorded include *Barbilophozia barbata*, *Frullania fragilifolia* (on a tree trunk), *Grimmia hartmanii* and *Plagiochila spinulosa*. There were several large patches of *Antitrichia curtipendula* on rocks in the scree below the crags. It was a nice mixed site at which to conclude the Spring meeting.

Uwch-y-coed (SN 8294)

After leaving the group before lunch, Ron Porley and Peter Martin drove south and stopped briefly at Uwch-y-coed, an impressive gorge near Machynlleth in Montgomeryshire (VC 47). *Grimmia atrata* grows in fair quantity on copper-rich rocks at this locality, and *Coscinodon cribrosus*, *Ditrichum zonatum* var. *scabrifolium* and *Oedipodium griffithianum* were also recorded.

Acknowledgements

We thank Peter Benoit for freely sharing his detailed bryological knowledge of the sites he visited with us during the meeting. We are also indebted for the help provided behind the scenes by our colleagues Fiona Evans, Annie Seddon, Doug Oliver, Rhodri Evans and Jonathan Neale in making access arrangements. Many landowners readily granted permission for the BBS to visit their property. Jean Paton kindly examined and confirmed material of *Cephaloziella massalongi* from Figra Mine and Hermon Copper Bog.

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TIM BLACKSTOCK and MARCUS YEO

SUMMER FIELD MEETING, FIRST WEEK: BALLACHULISH, 10-17 AUGUST 1996

Participants: Gordon Rothero (local secretary), Jeff Bates, John Blackburn, Agneta Burton, Blanka Buryová, Alison & Kevin Downing, Jeff Duckett, Bob Finch, Henk Greven, Roger Kemp, Niels Klazenga, Catherine LaFarge-England, Frank Lammiman, Brian O'Shea, Jean Paton, Mark Pool, Ron Porley, Christine Rieser, Anton Russell, David Rycroft, Tony Smith, Phil Stanley, Herman Stieperare, Alain Vanderpoorten, Harold Whitehouse.

With the field meeting following on from the Glasgow Symposium it was to be expected that numbers would be higher than normal but it is still pleasing that so many ventured north. On a couple of days we had 22 people in the field on one site, an unprecedented number in Scotland in recent years. Many of the group arrived in Glencoe in a downpour during Saturday but were rewarded by a dramatic clearance in the evening and, unbelievably, this settled weather remained with us until the final damp day. Most of the party that I was expecting (and even some that I was not expecting), met informally in the Glencoe Hotel on

Saturday evening and the Hotel proved a reasonable base in the evenings for the rest of the week. All of the scheduled excursions were in Main Argyll (VC 98) with the exception of the visit to Loch Sunart which is in Westerness (VC 97).

SUNDAY 11 AUGUST

Coire Gabhail, 'the Lost Valley', NN/168557, etc.

The wooded ravine that provides access to the 'lost valley' gives way to a jumble of huge boulders, also wooded, through which it is possible to scramble. This habitat has many of the common woodland species but also good populations of some plants normally considered to be more montane. Particularly notable throughout the ravine is the abundance of *Leptoscyphus cuneifolius* on both rocks and trees but, apart from small stands of *Aphanolejeunea microscopica* and the common epiphyte *Lejeunea ulicina*, many of the less common oceanic Lejeuneaceae are absent. The community of oceanic-montane liverworts normally associated with dwarf shrub heath over block scree, here descends into the woodland. *Mylia taylori*, *Pleurozia purpurea* and *Bazzania tricrenata* are common throughout and on the best ledges are joined by *Scapania ornithopodioides*, *Mastigophora woodsii*, *Bazzania pearsonii* and rarely *Plagiochila carringtonii*. Other plants of interest seen in this area were *Dicranodontium uncinatum*, *Kiaeria blyttii* (abundant), *Sphenolobopsis pearsonii* and *Antitrichia curtipendula* festooning several trees. We had lunch in hot sunshine at the top of the ravine, looking across at the (noisy) rock climbers on the east face of Gearr Aonach. The open, south-facing rocks opposite the lunch spot have an interesting flora including both the frequent *Racomitrium ellipticum* and the much rarer *Glyphomitrium daviesii*, the superficially similar capsule shape making for some confusion!

For some this was montane enough but the bulk of the party headed off up the path, making for areas of scree in the upper coire which holds snow late into the year. The walk proved very warm and enthusiasm for the upper screes waned in most and gradually interest was taken in lower rocky gullies until only Jeff Bates, Jeff Duckett and Anton could be glimpsed distantly, heading for the heights. In flushes close to the path Blanka found *Philonotis seriata* but generally the bryophytes on the ascent were rather dull. The screes proved interesting with good populations of both *Scapania nimbosa* and *Anastrophyllum donianum* in the interstices of the scree, and *Oedipodium griffithianum*, *Marsupella alpina*, *M. adusta* and *M. stableri* on the surfaces of the larger blocks and low crags. Leaving the two Jeffs to be looked after by Anton, the rest of the party ambled back down the path, revisiting some species in the ravine for those who had missed them on the ascent.

MONDAY 12 AUGUST

Bidean nam Bian, NN/141544, etc.

The crags and gullies at the top of the north-east coire of Bidean are well-known for their rich bryoflora and this area was our target. To reach the best ground involves a steep and unrelenting ascent which left little time for bryologising until lunch was taken on the terrace below the final screes and crags. The flushes in amongst the boulders were quite productive with good populations of *Pohlia wahlenbergii* var. *glacialis*, *Philonotis seriata*, *Bryum weigelii* and *Rhizomnium magnifolium*. On the rocks *Kiaeria falcata* and *K. blyttii* are common and there are scattered stands of *Arctoa fulvella*. There is a large area of interesting ground here with only time to cover a small part; the area we chose was the easy angled gully that leads up to the bealach between Bidean and Stob Coire nam Beith. This has some basic rocks on the north-facing retaining wall and also holds snow into the summer. In the scree

Scapania nimbosa and *Anastrophyllum donianum* are quite frequent and in the upper basin where snow lies very late there are good stands of both *Brachythecium glaciale* and *Lescuraea patens*. On the finer gravels at the margin of the scree there are large stands of *Pohlia ludwigii* but *Kiaeria starkei* is surprisingly infrequent. The base status of the rocks was quickly indicated by stands of *Orthothecium rufescens* and the occasional rosette of *Saxifraga nivalis*; other species of interest here include *Isopterygiopsis muelleriana*, *Leiocolea heterocolpos* and *Aulacomnium turgidum*. In the upper basin, below what climbers call Hourglass Gully is another rich area with both *Saxifraga rivularis* and *S. cernua* and Jeff Duckett and Alain found stands of *Marsupella boeckii*, *Timmia norvegica*, *Cirriphyllum cirrosum* and *Andreaea nivalis*.

A large sub-group, not relishing the ascent to Bidean, and with an interest in things *Grimmia*, undertook the long and tortuous drive down the west coast to Loch Melfort, south of Oban. Here the target was *Grimmia tergestina* on Creag an Sturra, originally recorded here as both *G. anodon* and *G. laevigata* until sorted out by Henk Greven. The quest was successful and, what is more, the plant was found with sporophytes for the first time in Britain.

TUESDAY 13 AUGUST

Coille Mheadonach and Glas Drum National Nature Reserve.

I had particularly wanted to show the overseas bryologists a good example of a wooded ravine with a diverse oceanic liverwort flora. Many ravines are awkward places for a large group but a brief visit to the Allt a'Mhuillinn in Coille Mheadonach by Loch Creran suggested that it might be suitable. In fact the burn was excellent, with easy access to the boulders which had good populations of interesting bryophytes (and no midges). *Drepanolejeunea hamatifolia*, *Harpalejeunea ovata* and *Aphanolejeunea microscopica* were frequent on most of the large blocks away from the main stream and in more regularly irrigated spots *Lejeunea patens* (abundant) and *L. lamacerina* occurred. A number of sheltered, steep rock faces in the burn had stands of *Plagiochila exigua* but more unexpected was the frequency of *Radula voluta*, much more common here than the more usual *R. aquilegia*. Also frequent on the upper surfaces of the rocks was *Grimmia hartmanii*; the gemmae on the upper leaves were visible on most stands but this is not usually the case in ravines and I suspect that the plant is often overlooked. Away from the burn, Jeff Duckett unearthed *Cryptothallus mirabilis* and a few trees and rocks had cushions of *Plagiochila atlantica*.

After a convivial lunch (still no midges) we moved closer to the head of the loch, to Glas Drum NNR. Ben Averis has recorded all the British species of *Plagiochila* here but on our brief visit the dense undergrowth and the lack of variety in the bryoflora did not compare well with Coille Mheadonach. Interesting finds included *Gymnostomum viride* on rocks in the woodland and a good population of *Cryphaea heteromalla* high up on elders in the lane.

WEDNESDAY 14 AUGUST

Beinn an Dothaidh NN/32-41-

Beinn an Dothaidh has relatively easy access from the north and a scattering of outcrops of calcareous schist as well as some small snow beds. There are a lot of interesting species recorded from this rich hill but the primary targets for the day were *Bryoerythrophyllum caledonicum* and *Odontoschisma macounii*. I thought that I could remember where I had seen both these species but inevitably it was all different on the day. Still, the initial outcrops of

basic rocks produced some montane calcicoles like *Eremonotus myriocarpus*, *Schistidium strictum* and *Myurella julacea* on ledges and good stands of *Odontoschisma elongatum* and *Calliergon trifarium* in peaty flushes. After lunch we scrambled up to a wet crag which proved interesting with nice stands of the rare fern *Cystopteris montana* and on a flushed rock slab a good population of *Hygrohypnum smithii*, a new record for Argyll.

Part of the group pressed on towards the summit to visit the small snow-bed areas at the head of some gullies. The fell-field was interesting with open patches giving stands of *Marsupella brevissima*, *Nardia breidleri* and *Ditrichum zonatum*. The best snow-bed was dominated by stands of *Kiaeria falcata* and *K. starkei* but also had large patches of *Moerckia blyttii* and stands of *Pleurocladula albescens*. On the bealach between Beinn an Dothaidh and Beinn Achaladair, an area of flushed grassland has a small population of *Oncophorus wahlenbergii*. Despite the fairly late hour some members of the party were keen to see the fern *Woodsia alpina* which occurs on the west slope of Beinn Achaladair so we made our way north along the slope maintaining height. The rock in the vicinity of the fern proved very calcareous with a number of interesting bryophytes. *Bryoerythrophyllum caledonicum* turned up at last and there were scattered small stands of *Hypnum bambergeri*, and an excellent population of *Scapania gymnostomophila*, another new record for Argyll. On isolated boulders below this crag there was frequent *Pterigynandrum filiforme* and patches of *Racomitrium himalayanum*.

THURSDAY 15 AUGUST

Loch Sunart: Ariundle National Nature Reserve, NM/83-64- and Laudale, NM/76-59- (VC 97)

The proximity of the Corran ferry and the good road to Strontian makes a visit to the Sunart area very straightforward from Glencoe. The rocky oakwood at Ariundle is an attractive place with an impressive biomass of bryophytes. Pride of place goes to *Plagiochila atlantica* which in the best part of the woodland occurs in vast abundance on almost every rock and tree base. There is also a good population of *Adelanthus decipiens* here, but this was looking much the worse for wear after what has (for the west coast) been a fairly dry 18 months. The southerly aspect and the open nature of the woodland means that other oceanic bryophytes are rather restricted and the ravine we visited was poor in comparison with Glen Creran.

At Laudale there are several small north-facing ravines which cut down through some fairly moribund-looking birch woodland. Despite appearances these are very rich and with the different aspect and rock type give a different flora to Glen Creran. The small Lejeuneaceae are again frequent on the faces of boulders in the burn and in one place here they were accompanied by *Colura calyptrifolia* and *Acrobolbus wilsonii*. Alain Vanderpoorten soon found *Sematophyllum micans* and this proved to be frequent in the middle and upper part of the ravine. Other plants of interest included *Lepidozia pearsonii*, *Metzgeria leptoneura* and *Radula aquilegia*.

FRIDAY 16 AUGUST

Meall Mor, NN/11-56-

Meall Mor is a lumpish hill compared with the spectacular peaks further up Glencoe but it has the virtue of an east-facing slope that is composed of metamorphosed limestone with a number of interesting plants. The fine weather had departed and the hill was misty and moist when we set out. The lower crags have plenty of interest with a good collection of the more common calcicoles and including some stands of *Orthothecium rufescens* with sporophytes

and at least one stand of *Gymnostomum insigne*. The ground steepened markedly above this but an open gully gives access to the upper slopes but it was slow progress. *Gymnostomum viride* proved quite frequent and there were also stands of *Schistidium strictum*, *Barbula reflexa*, *Grimmia funalis*, *G. torquata* and a tiny patch of *Bryum dixonii*.

After lunch we approached the upper band of crags and climbed steeply out onto the upper slopes observing good stands of *Hypnum hamulosum* on the way. Here there was some debate about the most promising ground and the party divided, the larger group going on towards the western coire, a smaller group heading south across the slope and two ploughing lonely furrows elsewhere. The ground to the west soon proved dull and so the main party returned to the east face to work the top crags there. At this point the cloud came down with a vengeance leaving both an irrevocably split party and a somewhat worried leader. The upper crags and the flushed grassland between and below them have a good bryophyte flora and some rarities including a little *Hypnum bambergeri*, *Tritomaria polita* and some good stands of *Barbilophozia quadriloba*. The descent through the cloud was steep but uneventful and it was with some relief that, with normal visibility restored, I could see the fragments of the party coalescing!

My thanks go to the various estates which allowed access and particularly to the National Trust for Scotland on whose ground we were on half the days and whose staff joined us on Bidean nam Bian. My thanks also to the rest of the group for making my task as 'leader' relatively simple and enjoyable.

GORDON ROTHERO

SUMMER FIELD MEETING, SECOND WEEK: BRAEMAR, 17-24 AUGUST 1996

SATURDAY 17 AUGUST

Loch Morlich, Inverness-shire, VC 96, 28/90

Nine members met at Loch Morlich on their way from Glencoe to Braemar to search for *Lophozia longiflora* on rotting logs in what appears to be its only British locality: see Long (1996) under *L. guttulata*. Liverworts seen near the south shore of the loch included *Kurzia sylvatica*, *Cephalozia pleniceps*, *Cephaloziella hampeana* and *Tritomaria exsectiformis*, all new to the 10 km square or, at least, not seen recently, but *L. longiflora* was not re-found.

A reduced party compared with Glencoe met at Braemar: Agneta Burton, Alain Vanderpoorten from Belgium, Blanka Buryová from Prague, David Rycroft, Harold Whitehouse, Herman Stieperaere from Belgium, Jean Paton, John Blackburn, Mark Pool, Robert Finch and Ron Porley, but with the welcome addition of Noel Pritchard, Rod and Vanessa Stern and Tom Blockeel. Later in the week, we were joined by Roger Kemp for one day and by David Long and Sonam Wangchuk from Bhutan for two days. On the 20th, Alain and Robert departed, but Nick Hodgetts joined us.

SUNDAY 18 AUGUST

Morrone Birkwood, Aberdeenshire, VC 92, 37/19

Cars were parked near the duck-pond just west of Braemar. On calcareous crags, Ron found *Stegonia latifolia* at 480 m altitude, and Tom found *Trichostomum crispulum**, *Racomitrium canescens s.s.* and *Orthotrichum anomalum*. Much of the woodland has been fenced to prevent grazing by deer, particularly of the juniper. Management of the National Nature

Reserve requires a balance to be struck between over-grazing on the one hand and birch invasion of the open flush areas of the wood on the other. In a flushed area, *Sphagnum warnstorfii* and *Scorpidium scorpioides* were seen, and Tom found *Plagiomnium elatum* in another. *Lophozia longidens* was found on juniper stems, and a hypnaceous moss on an isolated rock. This plant was at first thought to be *Hypnum hamulosum*, but proved to be *Ctenidium molluscum*.

Morrone, VC 92, 37/18

The higher parts of this hill have an acid substrate, where Ron found *Grimmia donniana* and *G. incurva* on rocks, Blanka found *Harpanthus flotovianus* in a basic flush and Jean found *Cephalozia leucantha* and *Scapania irrigua* on damp ground. On wet peaty soil in a seepage area, Tom found *Moerckia hibernica*, John found *Dicranella cerviculata* and Agneta found *Kurzia trichoclados* with its characteristic bulbils. There was abundant *Tetralophozia setiformis* on an exposed rocky ridge below the summit, mixed with *Anastrophyllum minutum*. *Bryum weigelii* was seen in a streamlet lower down.

About 130 species of bryophytes were recorded during the day.

MONDAY 19 AUGUST

The Cairnwell, west side, Perthshire, VC 89, to Loch Vrotachan, Aberdeenshire, VC 92, 37/17

Three members visited this hill, which was mist-covered. They took the chair-lift up to gain altitude. Ron found *Scapania gymnostomophila* on earthy ledges of base-rich rock outcrops at 800 m altitude in VC 89, growing with a curious form of *Dichodontium pellucidum*, *Fissidens cristatus* and *Thuidium abietinum* ssp. *abietinum*. Other interesting finds in a series of flushes down the slope draining into Loch Vrotachan, VC 92, included *Tritomaria polita*, *Oncophorus virens*, *Pohlia wahlenbergii* var. *glacialis*, *Meesia uliginosa* and *Cratoneuron decipiens*, the latter two found by Mark. *Sphagnum russowii* was also seen. The margin of the loch had much *Pohlia drummondii* on a gravelly substrate. New for the 10 km square were *Polytrichum formosum*, *Ptychomitrium polyphyllum* (both VC 89) and *Thuidium delicatulum* (VC 92). About 100 bryophytes were recorded. The Cairnwell was the site of the first excursion when the BBS was last at Braemar in 1964 (Warburg, 1965).

Gleann Beag, VC 89, 37/17

The majority of members did not fancy the Cairnwell in the mist (though, in fact, it soon cleared) and continued south into Gleann Beag. This glen was also visited in 1964 and is noted for several rarities on the calcareous outcrops on the east side of the valley: Jean re-found the *Jungermannia polaris* and Tom the *Desmatodon leucostoma*. Other species that he saw on the crags were *Encalypta ciliata*, *Aloina rigida*, *Mnium thomsonii* and *Pseudoleskeella catenulata* and Robert found *Leucodon sciuroides*. *Pictus scoticus* was not re-found, although we were very close to the site of the small tree on which it was found (Townsend 1982); there was discussion of its possible relationship to *Hygrohypnum luridum*, which can occur on trees (see para. 4, 20 August). *Meesia uliginosa* and *Amblyodon dealbatus* were seen in flushes and *Anoectangium warburgii* and *Catoscopium nigritum* by a waterfall. Tom visited flushes on the slopes and found *Scapania aequiloba* and *Orthothecium rufescens*. On flushed ground on the western slope of Meall Gorm, Jean re-found *Scapania degenii* close to where she had found it in 1964 (Paton 1966). Over 110 bryophytes were seen during the day, of which five (*Jungermannia confertissima*,

Dichodontium flavescens, *Fissidens bryoides*, *Racomitrium ericoides* and *Zygodon viridissimus* var. *stirtonii*) were new for this well-worked 10 km square.

Braemar Youth Hostel ponds, VC 92, 37/19
The Gleann Beag party explored these ponds, which had been found by Alain and were nearly dry and so ideal for bryophytes. Finds included two species new for South Aberdeenshire: *Fossombronia foveolata** and *Ephemerum serratum* var. *serratum**. Other plants present included *Fossombronia wondraczekii*, *Pellia neesiana*, *Sphagnum teres* and *Pohlia bulbifera*.

TUESDAY 20 AUGUST

Clais Fhearnaig, VC 92, 37/09
One party went to this narrow gorge, a tributary of the River Quoich. They entered by the western end, and soon found *Philonotis seriata* in a flush. Blanka found *Tetralophozia setiformis* in block scree. Much of the time, however, was spent examining some south-facing crags which were calcareous in part. Finds included *Grimmia torquata* plentifully, *G. funalis* and *Dryptodon patens*. Also seen were *Encalypta ciliata*, *Leucodon sciuroides and Pterigynandrum filiforme*, with an abundant sheet of *Antitrichia curtipendula* in one place. *Orthotrichum rupestre* was epiphytic on poplar, and also occurred on a nearby crag. *Grimmia donniana* was seen on several boulders. The floor of the valley is blocked by an old dam and contains a shallow peaty pool. Here Tom found *Haplomitrium hookeri* on the peaty margin under sedges, and *Ephemerum serratum* var. *serratum* on peaty mud; Nick found *Riccardia incurvata*. Along with yesterday's finds, these two latter were both new for South Aberdeenshire. Nearly 120 bryophytes were seen, of which nearly 40 were new for the 10 km square.

Glen Quoich, VC 92, 37/19
The Clais Fhearnaig party moved on to the lower part of Glen Quoich. A boulder scree on the slope of Creag Bhaig had been visited in 1964 and *Anastrophyllum saxicola* and *Cynodontium strumiferum* discovered there. Both were re-found. Why should *A. saxicola* be so abundant here and yet so rare in Britain as a whole? Its lack of means of dispersal does not seem to be an adequate explanation. *Tetralophozia setiformis* was also seen in the scree and *Scapania umbrosa* found on rotting wood, but *Anastrophyllum hellerianum*, seen in 1964, was not re-found. Other finds of note were *Odontoschisma denudatum*, *Barbilophozia atlantica* and *Orthodontium lineare*, all new for the 10 km square.

Forest of Alyth, VC 89, 37/15
A second party went to a valley bog on the moorland between Glen Shee and Glen Isla, but it proved to be of little interest. Two species new for the 10 km square were found on the side of a ditch by the road: *Dicranella rufescens* and *Pohlia wahlenbergii*. *Barbula revoluta* on the mortar of a bridge, and *Racomitrium ericoides* on sandy soil, were also new.

Nether Craig at south end of Mount Blair and Drumore Loch, VC 89, 37/16
The Alyth party moved to Nether Craig. After lunch in the cars because of rain, the weather improved. Altogether nearly 100 bryophytes were seen, of which nearly twenty were new for the 10 km square. These included *Cynodontium strumiferum* found by Harold on boulders below the crag, *Stegonia latifolia* found by Mark on the base-rich rocks of the crag and *Hygrohypnum luridum* var. *subsphaericarpon** on a birch trunk beside a streamlet, and *Rhytidium rugosum* on calcareous ground, both found by Jean.

WEDNESDAY 21 AUGUST

Glen Ey, VC 92, 37/08

One party explored this valley. Nearly 140 bryophytes were seen, of which nearly 60 were new for the 10 km square, indicating that this was an area little-visited hitherto by bryologists. Indeed, eight of the nine species of *Sphagnum* noted had not been recorded previously in 37/08. Jean found *Cephalozia loitlesbergeri* growing over *S. capillifolium* and *Leucobryum glaucum*, and near the Colonel's Bed ravine she found *Scapania lingulata** on a base-rich ledge on a rock and *S. degenii* in a flush, Mark found *Cololejeunea calcarea* on a basic rock face, and David Long and Rod found *Hygrobiella laxifolia* and *Cynodontium strumiferum*. It rained heavily at times and we had a wet picnic. By the track on our way back in the rain, Vanessa found *Marsupella funckii*. Several species that are common over much of Britain but rare in north-east Scotland were found: *Campylopus introflexus*, *Orthodontium lineare*, *Thamnobryum alopecurum* and *Rhynchostegium confertum*. The latter would have been a new vice-county record but no-one seems to have collected a voucher specimen.

Linn of Dee, VC 92, 37/08

The Glen Ey party moved to Linn of Dee, where *Bryum mildeanum* had been seen in 1964. We could not re-find it in spite of a careful search. A small side ravine 2 km west of Linn of Dee had abundant *Antitrichia curtipendula* and plants seen nearby by David included *Douinia ovata*, *Porella cordaeana*, *Lejeunea cavifolia*, *Cynodontium strumiferum*, *C. bruntonii*, *Pohlia drummondii* and *Zygodon baumgartneri*.

Juanjorge, Glen Clova, Angus, VC 90, 37/27

A second party made the long journey to Glen Clova. They were rewarded by re-finding *Grimmia unicolor* and *Bryum dixonii*. It was at Juanjorge that Ursula Duncan in 1964 had made the first find of *B. dixonii* since Dixon's original discovery of it on Ben Narnain, Argyll, in 1898, and it was also in 1964 that she re-found the *G. unicolor*, which had not been seen since 1883 (Duncan 1966). Six other species of *Grimmia* were seen, including *G. ovalis*, *G. britannica* and *G. decipiens*, found by Ron. Indeed, it proved to be an excellent locality for Grimmiaceae as a whole, with *Dryptodon patens*, *Racomitrium ellipticum*, *R. macounii*, *R. sudeticum*, *R. affine* and the *R. obtusum* form of *R. heterostichum* seen. Other notable finds were *Tetralophozia setiformis*, *Barbilophozia atlantica*, *Lophozia longidens*, *Douinia ovata*, *Cololejeunea calcarea*, *Cynodontium strumiferum*, *C. jenneri*, *Dicranoweisia crispula*, *Pterigynandrum filiforme* and *Plagiothecium denticulatum* var. *obtusifolium*. New for the 10 km square were *Campylopus introflexus* and *Rhabdoweisia crispata*. About 115 bryophytes were recorded at Juanjorge.

THURSDAY, 22 AUGUST

Caenlochan Glen and east side of Glas Maol, VC 90, 37/17

Cars were left at the top of the pass near the Cairnwell and members walked to the summit of Glas Maol. This was the route to Caenlochan that had been taken in 1964. On the present visit, the summit was hidden in mist and compasses had to be used to reach the south-west corner of the Glen.

Plants seen during the descent of a gully included *Lophozia opacifolia*, *Diplophyllum taxifolium*, *Oedipodium griffithianum*, male *Splachnum vasculosum*, *Pohlia ludwigii*, *Rhizomnium magnifolium* and *Plagiomnium medium**. On the east-facing cliffs as we

worked northwards, finds included *Herbertus stramineus*, *Anthelia juratzkana*, *Jungermannia polaris**, *J. borealis*, *Scapania calcicola**, *Cololejeunea calcarea*, *Seligeria recurvata*, *Encalypta alpina*, *Grimmia torquata*, *Mnium thomsonii*, *Amphidium lapponicum*, *Myurella julacea*, *Pseudoleskeella catenulata*, *Lescuraea patens*, *Hypnum bambergeri* and *H. callichroum*. At the north end of the cliffs, *Andreaea mutabilis* was found by David Long, *Plagiothecium denticulatum* var. *obtusifolium* and the rare fern *Woodsia alpina* were found by Rod, *Brachythecium glareosum* by Mark, and *Cratoneuron decipiens* in flushes by Ron and David.

In the boulder scree below the cliffs, Rod found *Lescuraea incurvata* (as well as *L. patens*), Jean found *L. plicata* and both she and Ron found *Marsupella adusta* on small stones. In the *Deschampsia cespitosa* grassland on the steep hillside between the cliffs and the boulders, Agneta found *Atrichum undulatum* and this prompted Harold to make a gathering from this habitat: it comprised *Fissidens taxifolius*, *Oxystegus tenuirostris* and *Bartramia ithyphylla* along with *Scapania scandica*, *Lophocolea bidentata*, *Riccia sorocarpa*, *Ditrichum pusillum**, *Philonotis arnellii*, *Pohlia ludwigii*, *Bryum* sp. (with brown ovate tubers) and *Isopterygium elegans*. This is a curious assemblage of species and a strange habitat for many of them. It does not correspond with the bryophytes listed by McVean (1964) for the alpine *Deschampsia cespitosa* association: clearly, the bryophytes of the grassland in Caenlochan Glen would be worth further study. The site was at 840 m, which is above the usual altitudinal limit for *O. tenuirostris*.

At the site of late snow patches on the ascent back to Glas Maol, plants seen included *Haplomitrium hookeri* found by Ron, *Scapania paludosa*, *Moerckia blyttii*, *Sphagnum girgensohnii*, *Polytrichum sexangulare* and *Bryum muehlenbeckii*, the latter found by Nick.

Besides the four plants new to the vice-county, eight species new to the 10 km square were seen: *Jungermannia subelliptica*, *Kiaeria blyttii*, *Campylopus pyriformis*, *Racomitrium macounii*, *R. ericoides*, *Bryum muehlenbeckii*, *Brachythecium glareosum* and *Hylocomium umbratum*. The total number of bryophytes recorded during the day at this remarkable place was about 200.

FRIDAY 23 AUGUST

Glen Quoich, VC 92, 37/19

Those who missed the visit to Glen Quoich on 20 August took the opportunity to remedy that. The *Anastrophyllum saxicola* was found by David Rycroft. Species seen that were not noted by the earlier party included *Barbilophozia lycopodioides*, *Gymnomitrion concinnatum* and *Isothecium myosuroides* var. *brachythecioides*, all found by Rod, and *Blepharostoma trichophyllum*, *Calypogeia neesiana*, *Jungermannia obovata*, *Lophozia bicrenata*, *L. obtusa* (new for 37/19) and *Scapania scandica*. Other species seen that had not been recorded before for 37/19 were *Campylopus introflexus*, *Trichostomum brachydontium*, *Brachythecium albicans* and *B. glareosum*, the latter found on a rock face by Mark. About 120 bryophytes were seen.

Clais Fhearnaig, VC 92, 37/09

Some of the Glen Quoich party went on to this gorge that others had visited three days before. In addition to re-finding many of the plants seen earlier, they recorded about a dozen species that the other party had not seen. These included *Anastrepta orcadensis* and

Racomitrium elongatum, both new for 37/09. *Fossombronia incurva* was seen and would have been a new vice-county record if a voucher specimens had been collected.

Glen Callater and Corrie Kander, VC 92, 37/18

A second party made the long walk up Glen Callater to Corrie Kander. Nick re-found *Bryum muehlenbeckii* where it had been found in 1964 by a stream near the head of Loch Callater and he also found it in Corrie Kander. Blanka re-found *Mielichhoferia elongata* at its classic site near Loch Kander. Tom found *Tritomaria polita*, *Andreaea mutabilis*, *Arctoa fulvella*, *Grimmia elongata** and *Racomitrium macounii* on the scree and crags above Loch Kander and Ron found *Grimmia incurva* on rocks. The *G. elongata* was a notable find, as it seems to be the first recent record for Scotland. According to Warburg (1965), it was found in Glen Quoich in 1964, but the find seems not to have been confirmed. *G. atrata* was re-found with abundant capsules. Cushions of *Hygrobiella laxifolia* were seen by a waterfall, *Conostomum tetragonum* on rocky ledges and *Plagiothecium denticulatum* var. *obtusifolium* in boulder scree. Other species seen in Corrie Kander were *Andreaea alpina*, *Grimmia donniana* and *Philonotis seriata*. About 110 species were recorded during the day, of which *Jungermannia hyalina*, *Pohlia drummondii* and *Hygrohypnum luridum* were new for the 10 km square and *Andreaea mutabilis*, *Tortella tortuosa*, *Grimmia elongata* and *Racomitrium sudeticum* had not been seen for many years.

The Braemar week was very successful. The number of interesting finds at well-worked sites was particularly gratifying. The week could not be expected to match the extraordinary success of the 1964 meeting, when nearly 100 new vice county records were made; on that occasion members were most energetic, visiting Beinn a'Bhuird, Lochnagar, Glas Tulaichean and Ben Macdhui during the fortnight.

We thank Dr Noel Pritchard for making the arrangements. I am grateful to David Long, Jean Paton, Mark Pool, Nick Hodgetts, Rod Stern, Ron Porley and Tom Blockeel for help with this report.

SATURDAY 24 AUGUST

nr. Rothbury, Northumberland, VC 67, 45/09

Five of us (Agneta, Harold, John, Nick and Tom) met here on our way south from Braemar in order to search for *Seligeria carniolica*. It had been found on small boulders in a shaded stream by Miss E.M. Lobley, R.D. Fitzgerald, R. Hall and J.H.G. Peterken in May 1964. We worked up the stream and Tom soon found non-fruiting material, recognized by the long, undulate subula to the leaves.

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HAROLD WHITEHOUSE

AGM AND SYMPOSIUM MEETING, NESS BOTANIC GARDENS, 1996

Dr Hugh McAllister of Ness Botanic Gardens, the local organizer, found us a splendid place to stay in Burton Manor, a large house on the Wirral converted into a conference centre. Ness Gardens, the venue for the meeting on Saturday, was a short car ride away, and members returned to Burton Manor in the evening for the Centenary Dinner. Sincere thanks to both Hugh and Dr Rachel Janes, also of Ness Gardens, for their efforts in organising this centenary AGM. My thanks also to the speakers for providing an entertaining and interesting selection of talks, particularly those who were called upon to contribute at short notice.

NICK HODGETTS

Dr Dennis Brown and Julian Smith (University of Bristol): 'The Wormery'.

A series of experiments to study the decomposition of 2 cm apical segments of *Rhytidiadelphus squarrosus* were described. A glass frame covered with netting was used in place of the traditional net bag and moss segments were placed directly on a lawn soil surface, after the grass had been removed. Segment losses were attributed to worms. Plastic drainpipes driven into the ground, with or without added worms, supported this suggestion. Drainpipes, partly filled with soil and containing a single worm (the wormery), were used under controlled laboratory conditions to test worm preferences for mosses held above the soil surface by supporting them through holes in a plastic dish. These showed that worms more readily consumed oven-baked moss apices more than either boiled or live green tips or brown bases and showed a stronger preference for oven-baked apices when soaked in extra nutrients obtained from homogenized fresh apices. Worms were most selective when the soil contained high percentages of leaf litter as an alternative food source, or when the soil or moss was wettest. The apparatus is a simple and convenient way of testing the role of worms in early stages of moss decomposition.

Dr John Edmondson (Liverpool Museum): 'Museum bryophyte collections: their scientific and cultural value'.

The bryophyte collections at Liverpool Museum were briefly described, with special reference to the historically important collections of Sir James Edward Smith, John Forbes Royle and the Liverpool Botanic Garden herbarium, which was founded in 1799. In order to maximize the scientific value of the collections and to increase the efficiency of the loans service, considerable effort is now being made to document them on computer. Liverpool Museum is also committing more resources to maintaining the stability of the specimens and their labels through appropriate conservation treatments and improved storage. The cultural value of such collections was also discussed, referring to the educational value of these records of the past activities of bryologists and the insights they give into the social milieu in which the collections were first made. Some thoughts were shared on the new uses of

preserved bryological collections, including their value as sources of DNA samples, for chemical screening, paleoclimatology, ethnobryology and pollution monitoring. Lastly, the point was made that the value of collections could be greatly enhanced through specialist input from taxonomic experts and other users.

Dr Mike Le Duc (University of Liverpool, Ness Gardens): 'Bryophytes and bracken control'.

Bracken, *Pteridium aquilinum* (L.) Kuhn, is a very serious weed in the uplands and marginal land of the UK. Dense monocultural stands are known to infest around 1.6% of the total land area, with a similar amount present as sparse cover. As bracken has a large underground rhizome system its elimination is impracticable.

In steep and undulating terrain the only effective method for bracken control is by aerial spraying with the herbicide asulam. This licensed process is increasingly widely used in the uplands, with about 6000 ha being sprayed in 1990.

The impact of asulam treatment on the vegetation of upland and marginal land is not well known, especially in the longer term. Asulam itself has a narrow spectrum of activity; it is known to damage only ferns, some docks and a small number of grasses. Asulam's effect on bryophytes is not known. Moreover, once sprayed the vegetation undergoes a post-treatment succession, the direction of which is influenced by a number of factors, some natural such as climate, others site- or management-specific, for example grazing pressure (Pakeman, Le Duc & Marrs, in press).

A research project, funded by the Ministry of Agriculture, Fisheries and Food, was instigated to address this problem. It was undertaken, jointly, by the Institute of Terrestrial Ecology (ITE), Monks Wood, and the University of Liverpool Environmental and Horticultural Research Station, Ness Botanic Gardens. The project co-ordinator (Robin Pakeman, ITE) and I shared the field work and, with the assistance of several students, we carried out a major survey in the summers of 1994 and 1995. With agreement from local managers we visited 117 sites, mostly heath and acid grassland, from Skye to Exmoor, the Lleyn Peninsula to the North York Moors. At each site transects were laid across the sprayed areas and 1-m quadrats were employed to assess the cover of vegetation. We used the chronosequence, or space-for-time substitution, approach and were thus able to estimate the course of events over a period of zero to 19 years after spraying.

A total of 75 bryophyte species were found in this study, 60 of which were mosses. The latter included the common heathland species *Dicranum scoparium*; but *Polytrichum formosum*, usually a woodland species, was more common than another member of the heathland community, *P. commune*. Several *Campylopus* species were found, including *C. pyriformis* and *C. introflexus* most commonly. *C. subulatus* was present at only a few sites, mainly in NW England and N Wales. *Leptodontium flexifolium* was also rare, being found only in NW England. The weft-forming pleurocarps, *Pseudoscleropodium purum*, *Rhytidiadelphus squarrosus* (the most commonly occurring of the mosses) and *Pleurozium schreberi* were all very common, as was *Hypnum jutlandicum*, seemingly quite adapted to surviving amongst thick bracken litter. *Eurhynchium praelongum* and *Hylocomium splendens* were both fairly frequent, notably at sites in the Southern Uplands and NW and NE England. Of the liverworts *Calypogeia fissa*, *Barbilophozia floerkei*, *Lophocolea bidentata* and *Ptilidium ciliare* were the most common. However liverwort recording was uneven and the data are not considered further here.

When sprayed and unsprayed sites were compared it was found that the frequencies of occurrence of the most common mosses were greater in the sprayed sites (Table). However when tested statistically it was found that only *Dicranum scoparium*, *Campylopus introflexus* and *Pleurozium schreberi*, perhaps the most shade-intolerant members of the group, showed a significantly greater frequency after spraying. None of the species tested statistically (Table) were less frequent on sprayed sites.

	Relative frequency (%)	
Species	Unsprayed	Sprayed
Polytrichum formosum	13	20
Dicranum scoparium *	27	54
Campylopus pyriformis	20	22
Campylopus introflexus **	7	47
Pseudoscleropodium purum	20	39
Eurhynchium praelongum	13	14
Hypnum jutlandicum	40	62
Rhytidiadelphus squarrosus	60	66
Pleurozium schreberi *	13	40
Hylocomium splendens	13	20

Table. Frequency of occurrence of the commoner species of moss on bracken-infested land. Comparison of sites sprayed with asulam (n = 101) with unsprayed sites (n= 15). Species showing distributions statistically (G-statistic) dependent on spraying are indicated by: *, $p < 0.05$; **, $p < 0.01$.

Many other factors could be responsible for determining species composition in a complex environment. To investigate this we used canonical correspondence analysis (CCA), a multivariate ordination technique that automatically relates, by regression analysis, ordination axes to measured environmental variables (ter Braak, 1986). In this way it was possible to assess the relative importance of a set of environmental variables, including elapsed-time since spraying, in determining species composition.

We found that the two most important variables influencing plant species composition were those determining geographical location, namely national grid easting and northing. The sequence of importance of the other variables was: distance of the site from the sea; altitude; amount of non-bracken litter present (a variable influenced by the general type of vegetation present); amount of animal excrement present (an indicator of the grazing pressure); elapsed-time since spraying. Two other variables were statistically significant, but less important in the model: site slope, and the amount of bracken litter present. The latter is a complex indicator of the vigour of the original bracken infestation and rates of litter breakdown and dispersal.

Using the CCA ordination scores for the ten common mosses on the vector of elapsed-time since spraying it was possible to elicit two main types of response to the spraying event. The first type was a continuing increase in abundance for some time following spraying. This behaviour was shown by *Polytrichum formosum*, *Dicranum scoparium*, *Campylopus*

pyriformis, *C. introflexus*, *Eurhynchium praelongum* and *Hypnum jutlandicum*. The other group (*Pseudoscleropodium purum*, *Rhytidiadelphus squarrosus*, *Pleurozium schreberi* and *Hylocomium splendens*) was found to show an initial increase in abundance, immediately after spraying, and then gradually decline.

Some areas of treated brackenlands in the North York Moors support this result for the alien *Campylopus introflexus*. A dense mat of the moss appears to be obstructing the establishment of other species. However our model suggests that after about nine years the problem may ease as the moss begins to decline in abundance. Colonies of *C. pyriformis*, on the other hand, tend to break up quite soon to provide establishment sites for *Calluna vulgaris*.

The disappearance of the weft-forming pleurocarps through time is thought to be associated with grazing pressure, which inevitably increases after the removal of the bracken canopy. However, the disturbance created by stock is very effective in dispersing thick mats of bracken litter. The process can often lead to the presence of bare ground, thus aiding the establishment of *Campylopus* species.

In conclusion, the process of spraying with asulam for bracken control does not, in itself, affect the distribution of the commoner mosses seriously, although the abundance of some may increase. However the post-treatment succession, which is affected by a number of other environmental variables, both physical and biotic, can interact to alter the bryophyte flora.

References

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Mr Brian O'Shea (London): 'The BBS and the Internet'.

The BBS now has its own 'Home Page' on the Internet's World Wide Web (WWW), hosted on the Edinburgh Royal Botanic Garden computer. The Internet is a way of connecting you and your computer to the computers of others, and these can be public or private, academic, commercial, personal, national government, or indeed any data resource that people want to make publicly available. If you are a private individual wanting access to the Internet, you will need a device called a modem to connect your computer via a telephone link to an Internet service provider (ISP). If you are connecting via your organisation, this part will not be visible to you: all you will be aware of is that the Internet link is there, usually on your local network (organisations may be ISPs themselves, or may take their service from an ISP using a permanent data link rather than a dial up service). The ISPs are connected into a global network which includes mechanisms for routing messages, maintaining addresses of all nodes on the network etc. Each node has a universal resource locator (URL) that indicates country (unless the USA when this is omitted), type of organisation and node name within that type of organisation. For instance my own node name is 'oshea.demon.co.uk' indicating that I get my service via an ISP called demon, which is a commercial organisation in the UK. The Royal Botanic Garden at Edinburgh has a node name 'rbge.org.uk', indicating that it is a non-commercial organisation. In practice URLs are not as simple as this, but the principle of the hierarchical address still applies. The URL for the BBS Home Page is:

http://www.rbge.org.uk/bbs

There are some organisations that provide an Internet service in a slightly different way, such as Compuserve. They have a self-contained network of their own which provides various internal facilities, but also have gateways out of the network into the Internet itself.

The Internet provides a number of facilities, but some of these are increasingly being subsumed within WWW, so the majority of people on the Internet now use three main facilities: email, newsgroups and WWW. Email (electronic mail) operates in a similar way to ordinary mail. You compose letters 'off-line' (i.e. you don't need to be connected to the Internet mail service) and then when complete 'send' them, which means that a link is made to the network and they are dispatched. Mail to you arrives in the same way: whenever the link to the Internet is open, mail for you can be received. If like me you are a personal subscriber to the Internet, this means that when you have letters to send, you connect to the network by clicking an icon on the screen (which initiates the dialling to my ISP), and then as soon as the connection is made all your mail is sent and any for you is received. You can then disconnect, after probably only a few seconds of phone use, and look at your received mail. If you are using an organisational machine, without the need for dialling up for connection, mail is sent and received constantly.

Newsgroups allow you to participate in discussion groups of specific interest to you, and all members of the group (which may be thousands) receive all contributions. There may be a number of 'threads' within the discussion group any of which you can follow or contribute to. The link to the Internet operates in a similar way to email. There is a specific one for bryology called 'Bryonet'. The World Wide Web (WWW) is the aspect of the Internet which has fuelled the exponential growth we are now seeing. WWW is a way of looking at information other people have made available on their computers as specially formatted documents that can contain pictures, sound, animations or video, and can be interactive. They are viewed using a computer program called a 'browser', such as Netscape or Microsoft Internet Explorer. There are two aspects that make this a much more powerful tool than it sounds. Firstly, the documents are 'hypertext' - that is, it is possible for a document author to highlight parts of the document that link you to more information on that subject. That link can be to elsewhere in the same document or to another document anywhere in the world, and the way that the WWW works means that the time to access a document on the same computer may not be significantly faster than accessing a document at the other side of the world. Potentially this makes each document like a page of an infinite encyclopaedia, and hence the term 'surfing the Internet'. Secondly, the documents are indexed via vast 'search engines' that constantly keep up to date with what's where, so you can search for 'bryology', and come back with thousands of 'hits'. As it will search for words in combination, this is usually the best way to find restaurants in Rochdale, the weather in Wales, mosses in Madeira, cinemas in Seattle or whatever else it is you want to search for.

The BBS Home Page (so called because it is where the BBS lives on the Internet) is intended to be both a shop window for the society and an information resource for both members and anyone else who is interested. The first page of a WWW site is usually a welcome screen of some sort, which says who you are and provides links to the documents that are available on the site. David Long is the 'editor' of the BBS site, appointed by Council, and although the initial launch of the BBS site was limited to documents that were easily available in computer format, David is now seeking views on how the site should develop.

Although it was possible to show samples of WWW documents on the overhead projector, we were fortunate that Ness Botanic Garden very generously provided two computers linked

to WWW for our use during the meeting, so we were able to demonstrate both the BBS site as well as links to the American Bryological and Lichenological site and other sites of bryological interest.

R.D. Porley (English Nature): 'The Darwin Initiative bryological expedition to Uganda'.

The Tropical Bryology Group last had a bryological expedition to Africa in 1991, when seven members went to Mulanje Mountain, Malawi. That expedition was largely self-financed. Progress has been steady with naming the collections and publishing the results. However, to maintain and develop the groups' expertise in tropical bryology, particularly in the field, it was decided to return to Africa. It was agreed that this time we would need to seek funding for the expedition, and we submitted a proposal to the Darwin Initiative in late 1994. This is a fund established by the UK government following the Earth Summit in Rio de Janeiro in 1992. Its purpose is to support the development of an integrated strategy for the deployment of UK scientific, industrial and managerial expertise to assist developing countries implement the Convention on Biological Diversity.

We were delighted to learn that the proposal had been successful and that we had secured funding to enable a three year project to go ahead. The project was to study and document the bryoflora of montane rain forests in Uganda. The present political stability in Uganda, the dearth of published bryological data for the country, the pressing priority to document the biodiversity in one of the richest parts of Africa, and to contribute to the effective conservation of the rain forests convinced us that Uganda was the country to go to. Furthermore, Uganda represents something of a gap in our knowledge of the bryoflora of East Africa, with Tanzania, Kenya, Burundi, Rwanda and eastern Zaire being relatively better known.

There are five key objectives of the project:

- to make as complete an inventory as possible of the bryophytes of Bwindi Impenetrable National Park, Rwenzori National Park and other montane forests in western Uganda.
- to compare the bryophyte floras of these areas both with each other and with other East African forests.
- to identify centres of bryological diversity as a contribution to their effective conservation.
- to communicate the bryological importance of the study areas to specialists and administrative authorities.
- to facilitate the study of bryophytes in Uganda by providing bryological literature and training for local botanists, and donating a set of named vouchers to the herbarium of Makerere University.

Six UK members of the Tropical Bryology Group, Jeff Bates, Nick Hodgetts, Howard Matcham, Ron Porley, Robin Stevenson and Martin Wigginton left England on 19 January, 1996. We were joined in Kampala by Stephen Byarujali and Berna Nakityo of Makerere University.

Uganda is about the same size as the UK although 25% of the country is water (Lake Victoria, Albert, Edward, George, Kyoga and The Nile). It is situated on the equator on the Central African Plateau with most of the land over 1000 m above sea level. The Rwenzori,

Ptolemy's fabled Mountains of the Moon, forms the western border with Zaire, and Mt. Elgon rises above the plains over to the east on the Kenyan border.

Bwindi Impenetrable National Park, the main study site in year one, is located in the south west corner of Uganda at the end of the western arm of the Great Rift Valley. It covers some 321 km^2 and varies in altitude from 1160 m to 2600 m. It is of one of the few forests in East Africa to show an intact altitudinal zonation from lowland forest type, through sub-montane to montane. The known flora and fauna of Bwindi is impressive: there are over 1000 vascular plants, possibly a greater number of trees than in any other East African forest, there are several endemic trees and many central African trees reach their eastern limits here. It is the best forest for primates in East Africa, supporting about half the global population of mountain gorilla. In addition there are chimpanzees, black and white colobus and several *Cercopithecus* species, 58% of African montane birds, also occur in Bwindi, including the spectacular Rwenzori turaco. Bwindi is an important Nile catchment area and is vital for watershed protection (facilitated by the large bryophyte biomass acting as a slow release sponge).

The drive from Kampala to Bwindi, which took us across the equator, was about 400 km. It seemed to be twice as far though because of the rather ancient Landrover (probably from the old Colonial days) which we had the use of. Howard was voted to be our main driver and it was no easy task. However, despite the bonnet having to be raised far too frequently, it did eventually get us there (and back). Daily sorties on foot were made into Bwindi forest from Ruhiija, our base for the first half of the trip, and then from our base at Buhoma, which took us further north.

Bryophytes were collected from as wide a range of habitats as possible; particular attention was paid to twigs and branches laying on the forest floor as this was the only way to sample the canopy. Typical plants found in this situation were *Mastigophora diclados*, *Chandonanthus hirtellus* and *Macromitrium* spp. The forest floor, on bare exposed earth banks, could also be rewarding, with *Telaranea nematodes* and two ecostate *Fissidens* species, *F. bryum* and *F. usambaricus*, all previously unreported for Uganda. However, trees proved to be amongst the most productive of the habitats for bryophytes, supporting diverse range of epiphytes and epiphylls. *Plagiochila squamulosa* was particularly prominent, together with *Pilotrichum* sp., *Calyptothecium hoehnelii*, *Porothamnium* spp., *Syrrhopodon gaudichaudii* and, more rarely, *Prionodon* sp. More familiar plants were also present, such as *Pterogonium gracile* and *Leptodon smithii*. Buhoma was noticeably more humid than Ruhiija and correspondingly richer in bryophytes. Epiphylls were encountered in some quantity, including the distinctive *Radula flaccida* and *Caudalejeunea* sp. Other notable plants from this area, and not so far recorded for Uganda, include *Distichophyllum rigidicaule*, *Homaliodendron piniforme*, *Syrrhopodon gardneri* and *Frullania diptera*.

In addition to the general collecting, Jeff Bates was keen to undertake an ecological study or two. The main study involved investigating bryophyte diversity and species ranges in relation to altitude. Five plots, 25 × 25 m, were delimited at points along an altitudinal gradient and all bryophyte species recorded noting whether on trees , rotting wood, rock, on leaves and so on. Observations on stand structure, vascular flora and topography were also made. Alongside this study was an investigation of epiphyte communities. In each of the plots mentioned above, five mature trees were selected and the epiphyte community sampled by a 25 × 10 cm quadrat attached to the trunk at about chest height. This was repeated at a number of aspects on each tree to characterize any variation in the community. One of the

plots was set up in high altitude bamboo forest; bryophytes were present on the stems particularly around the rough nodes.

It was decided that two members, Nick and Ron, accompanied by local trackers, would make an excursion into the interior; a day to walk in, a full day collecting and the third day to walk out. Two memorable nights were spent under canvas deep in the rainforest, all too aware that the tents were pitched across a regularly used elephant track. Luckily for us they didn't pass this way again, at least while we were there. In this part of the forest, large buttressed trees were common having escaped the deprivations of loggers. Tree-ferns were also a prominent feature of this area, and the moss *Rhizofabronia persoonii* appeared to be restricted to their fibrous stems. Epiphylls were common, with many representatives of Lejeuneaceae, including *Taxilejeunea pulchriflora*, *Colura tenuicornis* and *Odontolejeunea lunulata*, all unrecorded for Uganda. Several epiphyllous *Daltonia* spp. were also collected. On our way out of the forest we saw fresh gorilla nests, and it was quite a thought that we had been sleeping just a few hundred metres away from these incredible animals.

The number of published taxa from Uganda prior to our visit is something in the order of 362 mosses and 156 liverworts. Bryology in Uganda dates back to the early 1800s a period when some type specimens were published. Several collections have been made since, for example in the 1920s and 1930s, and with a particular increase in activity in the 1950s and 1960s, just before Independence and the Amin era. A large number of collections reside in the British Museum (Natural History), some named, but many not. Brian O'Shea has started working on these collections. Makerere University also houses a small collection of bryophytes from Uganda, some with familiar collector names, such as Alan Crundwell and Francis Rose. However most of these are also un-named. It is early days yet with the naming of our material, but many species are turning out to be new to Uganda, and for mosses the total is now in excess of 400 and for liverworts over 200.

All those who took part in the expedition had memorable experiences. For me, and I suspect others too, it was to see, at close range, a family of mountain gorillas set against the backdrop of their montane rain forest home.

Finally I would like to say many thanks to Nick Hodgetts and Martin Wigginton who did virtually all the organisation of the expedition, both before we left these shores and in Africa.

Jane Burch (Manchester University): 'The Leucobryoid leaf.'

The leucobryoid leaf is a multistratose leaf, characteristic of ten genera of mosses, and consists of dorsal and ventral layers of hyalocyst cells sandwiching a median layer of chlorocysts. The leaf structure is distinctive, giving the mosses a whitish appearance especially when dry, hence the general term leucobryoid mosses, derived from the widespread genus *Leucobryum*.

The leucobryoid leaf is quite variable in the details of its structure between genera. For example, in some cases there are additional superficial networks of chlorocysts, and in others additional layers of hyalocysts. Moreover, sporophyte structures such as the peristome, indicate that genera with the leucobryoid leaf are not necessarily closely related. The question arises as to whether the leucobryoid leaf can be regarded as a monophyletic character, or a response to habitat selective pressures that has arisen several times.

In order to investigate this problem, the leucobryoid leaf from a range of mosses was analysed using light microscopy. Each moss was scored according to ten characters relating to the leucobryoid leaf, and possible homologous structures were sought between leucobryoid leaves, and also in non-leucobryoid leaves which might give clues to the phylogeny of these mosses. The data were processed using the cladistic program Henig86 (whose results were largely discounted), and also cluster analysis.

From this study, it appears that the leucobryoid leaf evolved on at least five different occasions:

- *Leucophanes* is the only genus in which the leucobryoid part of the leaf originated from the lamina. This therefore led to the conclusion that it has a separate evolutionary line, and is the only genus belonging to the Leucophanaceae.
- *Octoblepharum*, *Exodictyon* and *Arthrocormus* remain within the Syrrhopodontales, but in a separate family from *Leucophanes*.
- Leucobryaceae genera *Schistomitrium* and *Leucobryum* (*pro parte*), have extra strata of hyalocysts, and may have evolved from a *Campylopus*-type ancestor via a *Brothera*-type leaf, with the central cells accounting for the increased number of hyalocysts.
- Leucobryaceae genera *Cladopodanthus*, *Ochrobryum* and *Leucobryum* (*pro parte*), evolved from a *Campylopus*-type ancestor via a *Paraleucobryum*-type leaf, with just two hyalocyst strata, sandwiching chlorocysts between them.
- *Theriotia* represents a separate evolutionary line from an ancestral moss.

These results support the theory, based on sporophyte structure, that the leucobryoid leaf is polyphyletic, but may highlight potential inconsistencies such as the split within *Leucobryum*, which require more detailed analysis.

The paper was based on a third-year undergraduate project (supervised by Sean Edwards) at Manchester University. It is important to state that the project represented a feasibilty-study for the investigation into the phylogeny of the leucobryoid leaf, and the brief results given above do not represent a proposed phylogeny, but may be useful as pointers for further research.

Mr Ray Woods (Countryside Council for Wales): 'The conservation of bryophytes in Wales'.

The framework of statutory conservation measures was explained for Wales. There are now over 900 Sites of Special Scientific Interest covering over 207,000 hectares. Whilst few SSSIs have been notified exclusively for bryophytes, most important bryophyte sites have been protected by this mechanism. A recent survey of Brecknock showed that 89% of all the mosses recorded from the vice-county and 90% of the liverworts occurred on SSSIs. In Radnorshire, 84% of mosses and 95% of the liverworts were represented on SSSIs. The relationship of the SSSI system to National Nature Reserves and Local Nature Reserves was then explained.

Such designations will only ever cover a small proportion of the countryside. To promote conservation of important habitats in the wider countryside, a range of agri-environment conservation schemes have been developed. These include the Tir Cymen, Environmentally Sensitive Area (ESA) and Habitat Schemes. All seek to prevent damage to a range of bryophyte-rich habitats, such as woodlands, wetlands, rough grazings and rock outcrops, and operate in discrete areas of Wales. These schemes have now been running long enough to

begin to judge their effectiveness. Tir Cymen and the ESAs have so far attracted voluntarily nearly half of the farms which were eligible into the schemes. A Welsh Office review is underway to recommend the best way forward.

Finally, members were alerted to the important developments arising from decisions taken at the World Environmental Summit in Rio de Janiero in 1992. Action Plans have been drafted to encourage the conservation of some of our most threatened bryophytes. It is important that the BBS plays a full part in guiding the development of these plans and the selection of the species. Plans have been, or will be, drafted to conserve a number of bryophyte-rich habitats, such as upland oakwoods.

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FIELD EXCURSION TO ESCLUSHAM MOUNTAIN, 22 SEPTEMBER 1996

The weather was warm and sunny for the excursion to Esclusham Mountain (VC 50), an area of North Welsh moorland which was bryologically unknown. The rock is Millstone Grit, so that most of the land is acid. There are, however, numerous old mines, where the underlying Carboniferous limestone has been extracted and dumped on the surface.

The first thing that caught our eye as we examined some mine spoil was a large quantity of *Ditrichum flexicaule** s.s., forming its distinctive dense tussocks. Other calcicoles of interest were *Climacium dendroides*, *Cratoneuron commutatum* var. *falcatum*, *Orthotrichum cupulatum*, *Plagiomnium cuspidatum* and *Rhodobryum roseum*. Ron Porley found *Entodon concinnus*, which had not been seen in the vice-county since about 1920, when it was found nearby at Minera. Alan Crundwell found *Bryum creberrimum*.

The calcifuge and calcium-indifferent flora was larger but less remarkable. We found 10 species of *Sphagnum*, including *S. girgensohnii* and large quantities of *S. russowii*. *S. capillifolium* by contrast was scarce and found by only one participant. Also on wet ground were *Calliergon stramineum*, *Drepanocladus exannulatus* and *D. fluitans*. *Racomitrium elongatum* and *R. ericoides* grew on dry ground near the road, and *Dichodontium pellucidum* (confusingly) on limestone rubble. Liverworts were few, with *Barbilophozia floerkei*, *Ptilidium ciliare* and *Tritomaria quinquedentata* perhaps the most notable.

Although we eventually recorded the quite respectable number of 101 species for the card, we were a little disappointed not to find any lead-mine specialists. These could well exist in the area, perhaps nearer Minera, where there are numerous other mines.

MARK HILL

BRYOPHYTE WORKSHOP, UNIVERSITY OF WALES, CARDIFF, 1996

On the very stormy weekend of 26-27 October, 17 BBS members got together at Cardiff to examine sectioning techniques, and the taxonomic significance of sections, in bryophytes. Tom Blockeel produced and led the programme which covered topics at the cutting-edge of bryological research. Roy Perry was local organizer and had arranged facilities in the School of Pure and Applied Biology, University of Wales, Cardiff, by kind permission of Prof. John

Fry. Sean Edwards had provided some of the presentational material on sectioning techniques. We were joined by two museum staff, Victoria Purewal, Conservator, and Kathryn Cliffe. In the Centenary year it was fitting for those unfamiliar with the BBSUK herbarium (and indeed the herbarium of NMW), to have the opportunity during the weekend to inspect it deep within the catacombs of the museum.

Saturday 26 September

We began the session by considering some leaf-section terminology, such as guide cells, hydroids and stereids, and hearing of the value of leaf sections in separating some recently described species from their near relatives, on the basis of leaf stratosity. The various methods that can be used to section bryophytes were then discussed. These ranged from the microtome (but who has one of these?) through wax embedding (too messy and time consuming) and elder pith or carrot (too much detritus gets on slide) to free-hand sectioning.

There is no doubt that free-hand sectioning of leaves gives quick and excellent results, but each individual may have their own preferred method that works for them. The method advocated at the workshop was to take some wetted leaves (no more than 4 or 5 normally suffice) and lay these side by side in a row on a microscope slide, and place over them another slide to hold them firmly in position, and at the same time provide a cutting-edge guide. By doing this it is easy to control where on the leaf one makes the section. A double edged razor blade (preferably broken in half) is then drawn at an angle across the leaves using the upper slide as a guide. The blade can be tilted incrementally as the leaf is sliced, giving several near-perfect sections. It is critical that sharp blades are used; a corner of a blade may be used for sectioning something up to four specimens, by which time it will have become blunt (but is still adequate for cutting stiffer tissue such as stems).

We then moved on to examine the question of *Cinclidotus riparius* in Britain, and had the opportunity to try out the method outlined above. This plant has always been of doubtful status in Britain, being very difficult to separate from *C. fontinaloides* in the absence of sporophytes (putative *C. riparius* has never been found with sporophytes in Britain). Recent work on the species, though, has suggested that there may be a good distinguishing character in the cross section of the thickened leaf margin. We were given continental *C. riparius* (with exserted capsules) and vouchers of British *C. fontinaloides* and putative British *C. riparius* to section and compare. To the surprise of everyone, specimens of putative *C. riparius*, all from the River Teme, matched continental *C. riparius* in terms of leaf margin anatomy. The margin in cross section of *C. riparius* seems to have more or less uniform isodiametric cells, whilst *C. fontinaloides* is quite different in having a distinct inner group of heavily incrassate, smaller stereid-like cells running through the centre of the thickened margin. By the end of the morning many people were converts to the sectioning method, but we also recognized that the *Cinclidotus* issue needs to be followed up.

After lunch we had a session on *Racomitrium* and *Grimmia*, two genera that have always, and justifiably so, been regarded as difficult. There have also been many recent publications on these plants (Bednarek-Ochyra, 1995; Frisvoll, 1983, 1988; Greven, 1995; Maier & Geissler, 1995) and much emphasis has been placed on leaf sections. We had a quick run through some taxonomic characters that are relevant in distinguishing *Racomitrium* species:

- Papillosity: the British species fall into three groups, those with conical papillae (*R. canescens* agg.), those with smooth leaf cells (*R. ellipticum* and *R. heterostichum* agg.), and

those with flat plate-like papillae which give a 'cobblestone' effect to the leaf surface when viewed in section. The plate-like papillae are particularly useful in identifying depauperate specimens of *R. fasciculare* and in separating *R. aquaticum* from muticous forms of *R. heterostichum*.

- Supra-alar cells: these are the marginal cells at the leaf base. In some species, especially the non-British *R. microcarpum* and to some extent also *R. sudeticum*, they form a pellucid band. Their shape is important in separating *R. ericoides* from *R. elongatum*.

- Leaf section profile: the profile of the leaf in section is determined by the width of the nerve, and is important in separating species of the *heterostichum* agg. Species with a wide nerve have a broadly channelled (canaliculate) leaf; those with a narrow nerve have a ± keeled leaf.

- Nerve section: the thickness of the nerve (in terms of the number of cell strata) is particularly important in the *heterostichum* aggregate.

- Outer perichaetial leaves: these are reflexed in *R. himalayanum*, erect-spreading in other species.

- Inner perichaetial leaves: these constitute a well-defined character for separating some similar species. In *R. heterostichum* and *R. affine* they are strongly differentiated, with hyaline esinuose cells. In *R. sudeticum* and *R. macounii* they are only moderately differentiated from the vegetative leaves, and the upper cells have sinuose walls.

With *Grimmia* it was noted that the distinction from *Schistidium* can be very subtle, but *Schistidium* generally has a deciduous columella that is lost with the capsule lid, it has a small calyptra not extending below the lid, the nerve cells in section are usually homogeneous and the plants often have a reddish tinge to them. A list of key characters of *Grimmia* was then presented:

- Insertion of lamina onto nerve: three general types were recognized. Some species (e.g. *G. montana*) have the lamina, as seen in section, arising vertically from the nerve. Consequently these species have a deep narrow slit running along the ventral surface of the nerve, and the leaf easily splits longitudinally under a coverslip. A second type is found in *G. laevigata*. Here the lamina is inserted sideways onto the nerve and the leaf is rounded in section. The third and most common type has the lamina attached obliquely and the leaf is therefore V-shaped or keeled in section. It was noted that *G. ovalis* and *G. affinis*, two much confused species, are readily separated by leaf sections (these being rounded and V-shaped respectively).

- Stratosity: though widely used in keys, the stratosity of the leaf lamina must be used with caution. Some normally unistratose species (e.g. *G. trichophylla*) are sometimes partly bistratose near the leaf apex. Other species (e.g *G. donniana, G. sessitana*) are not always uniformly bistratose.

- Hair points: in species with short hair-points (e.g. *G. hartmanii*) the cell lumen is usually readily discernible. However, examination of herbarium specimens suggests that this character may not always be clear-cut.

- Nerve section: species of *Grimmia* usually show some differentiation of the cells in the nerve section, hydroids or stereids often being present.

- Basal leaf cells: the shape of the basal cells (i.e. short or elongate) is a critical character in some species, and the marginal cells are often differentiated from the cells near the nerve. However in some species (e.g. *G. donniana*) this differentiation is weak. The marginal cells often have thickened cross-walls. *G. laevigata* is distinctive in having basal marginal cells that are incrassate and often wider than long.

- Cells above leaf base: these are often strongly incrassate. However, in *G. incurva* they are nodulose (irregularly thickened) rather than sinuose.

- Upper leaf cells: species with distinctive upper leaf cells include *G. decipiens* (cells elongate) and *G. elatior* (cells with rounded papillae).

- Gemmae: these are known in *G. hartmanii* (on the apices of the upper leaves) and in *G. trichophylla* and *G. torquata* (on the dorsal surface of the leaf at the base).

- Presence of innovations: these are distinctive in the interior of *G. funalis* tufts, having diminutive shell-like leaves and appearing cord-like.

- Leaf posture: some species have curled or twisted leaves when dry, but this is not always a reliable character. *G. incurva* fo. *brevifolia* and many forms of *G. funalis* have ± straight leaves.

It was noted that some dioecious species of *Grimmia* have dimorphic male and female plants.

Keys to *Racomitrium* and *Grimmia* were handed out, and BBS herbarium material made available to practise techniques upon and test the keys, or we had some of our own material that had always resisted naming.

As a postscript to *Grimmia*, we looked briefly at the recent revision of Scandinavian *Schistidium* species by Hans Blom (1996). Blom's treatment has still to be applied to British material, but only twelve of the 31 Scandinavian species of the *apocarpum* complex are known to occur here at present. A key to the twelve British species, extracted from Blom's book, was distributed.

On Saturday evening we were the guests of NMW, and honoured to be joined by Dr Eurwyn Wiliam, Assistant Director, and his wife. An excellent buffet with wine was laid on for us, and we thank Deb Spillards for her hard work. Then we were shown the Botany Department by research assistant George Hutchinson and Victoria Purewal. One of the museum galleries was opened specially for us but our only slight disappointment was that the giant bugs ('Megabugs') would not perform for us – apparently the air compressor was out of action.

Sunday 27 September

As something of a departure from the usual workshops of the past, it was decided not to have a field excursion but to continue the session on the second day in the lab. This had nothing whatsoever to do with the weather, but was more of an acknowledgement, made well in advance, that we would get much more out of the weekend by concentrating on

methodologies and having recourse to expert tuition. We thus turned our attention to pleurocarpous mosses and the value of stem sections for separating a number of easily confused species.

The terms hyalodermis (large thin walled cells surrounding the stem) and central strand (small group of elongate cells running through the middle of a stem axis) were defined. Although the hyalodermis is readily observed in section, it is often collapsed or eroded and may therefore be overlooked on casual inspection. Its usefulness was illustrated in the case of the often difficult to separate *Hygrohypnum ochraceum* (hyalodermis present) and *Hygrohypnum luridum* (hyalodermis absent). Special attention however was given to *Drepanocladus revolvens* agg. and *D. vernicosus*. By making stem sections *D. vernicosus* is usually easily separated from *D. revolvens* agg.: it does not have a hyalodermis whilst the latter aggregate does. It is now recognized that we have two good taxa within *D. revolvens* aggregate: *D. revolvens sensu stricto* and *D. cossonii*. With some experience typical plants of these two plants can be distinguished by their jizz, but the best way to separate them is as below (see also Hedenäs, 1989):

D. revolvens s.s...... mid-leaf cells long (60-140µm), tapered at the ends; autoecious
D. cossonii..... mid-leaf cells short (20-95µm), often with transverse blunt or oblique end walls; dioecious

Finally we briefly considered the small members of *Hypnum*. The presence or absence of a hyalodermis can be used to separate two Sections of the genus, Hamulosa (with hyalodermis) and Revolutohypnum (lacking hyalodermis). A plant that some people saw at Morrone in Scotland during the BBS summer meeting this year, pronounced in the field to be *Hypnum hamulosum*, turns out upon sectioning not to have a hyalodermis, so cannot be *H. hamulosum*. It was hoped that similar plants might be found in the BBS Herbarium, and one such plant was. The latter plant turned out to be not a *Hypnum* but a form of *Ctenidium molluscum*. Subsequent examination has shown that the Morrone plant is also *Ctenidium,* a confusing form with poorly differentiated stem leaves.

Herbarium material of *Drepanocladus* and *Hypnum* were made available for us to section. This transpired to be quite a revelation, since quite a lot of material purporting to be one thing (including new county record vouchers) was in fact something else. Mixed gatherings were also found to be a trap for the unwary!

Everyone was unanimous that this was an immensely interesting meeting, and our appreciation was duly given to both Tom and Roy. We are also most grateful to University of Wales, Cardiff and NMW for such a delightful setting in which to hold the weekend.

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R.D. PORLEY and T.L. BLOCKEEL

FUTURE MEETINGS OF THE SOCIETY

Members are reminded to read the BBS Safety Code, which is published in *Bulletin* **43** and is available from local secretaries for inspection during BBS meetings. Please inform local secretaries well in advance if you intend to join a meeting, even if you are not staying at the headquarters hotel.

SPRING FIELD MEETING 1997, Torquay, Devon, 2-9 April.

Local Secretary: Mark Pool, 'Camelot', 91 Warbro Road, Torquay, Devon, TQ1 3PS. Tel.: 01803 316154 (evenings please).

Headquarters: Norcliffe Hotel, 7 Babbacombe Downs Road, Torquay, TQ1 3LF. Tel.: 01803 328456. Tariff (1996 rates): B. & B. £18 per person per night; evening meal £10 per day. Participants should make their own booking arrangements with the Norcliffe but should mention the British Bryological Society when doing so, as several rooms (twin-bedded, *en suite*) have been reserved for us. If these have all gone, others, of various types, may well be available (early booking advised). Those not wishing to stay at the headquarters hotel are well catered for: Torquay contains a multitude of hotels, guest houses and holiday flats. There are no camp sites within the town *sensu stricto*, but they can be found in plenty a short drive away. Interested members are recommended to contact the Torquay Tourist Information Office (Vaughan Parade, Torquay, TQ2 5EG; tel. 01803 297428), who will send the local guide book free of charge.

South Devon (VC 3) is a fascinating area for the bryologist, its topography ranging from the granite uplands of Dartmoor to estuaries such as that of the Exe, with most forms of terrain in between. This variety, coupled with low levels of air pollution and a mild, damp climate, results in a very good bryophyte flora. Many species which are rare or absent over much of the south-east are frequent here; examples are *Bryum donianum*, *Epipterygium tozeri*, *Neckera pumila* and *Tortella nitida*. Torquay itself, with considerable exposures of Devonian limestone together with shale, slate, grit, red sandstone and dolerite, to some extent epitomizes this variety. The rich limestone area of Walls Hill Downs lies within a short walk of the headquarters hotel and has (among much else) *Cheilothela chloropus* and *Petalophyllum ralfsii*. A little farther away, the dolerite outcrop of Black Head possesses *Lophocolea fragrans* and *Porella arboris-vitae*.

A detailed itinerary has not yet been worked out, but will be available later. Participants are likely to visit granite moorland (including bogs), steep-sided river valleys with sessile oak woodland, limestone woodland and downland, lowland heath (it is hoped) and coastal cliffs on a variety of rock types. The area has been reasonably well-worked bryologically, but there are many additions still to be made. (The discovery, in 1996, of several colonies of the rare *Cryphaea lamyana* in a new area would seem to bear this out.)

Please inform the local secretary in advance if you hope to be attending: this ensures that you will be sent full details, and also gives some idea of the likely pressure on car parks, etc., during excursions.

SUMMER FIELD MEETING 1997 (I), North-east Yorkshire, 13-20 August.

Local secretary: Mr J. Blackburn, 6 Bylands Grove, Fairfield, Stockton-on-Tees, Cleveland, TS19 7BG. Tel.: 01642 583815.

The headquarters hotel will be the Beansheaf Hotel, Malton Road, Kirby Misperton, Malton, YO17 0UE (Tel. 01653 668614). This hotel is 2½ miles south of Pickering and has been chosen because it has a good mix of accommodation, all *en suite*. Pickering is a popular tourist area, 20 miles from Scarborough, so early booking is recommended. There is plenty of varied accommodation available in the area, details of which will be supplied on request.

The last meeting of the Society in north-east Yorkshire was held in 1967, based in Northallerton, when most sites visited were in the western part of VC 62. This meeting will visit several sites covered on that occasion, but concentration will be more easterly. The sites to be visited will be varied. At least two days will be spent on acidic sandstone uplands and will include broadleaved woodlands, gills and griffs, as well as two bogs. Species in the wooded valleys could include *Discelium nudum*, *Dicranella subulata*, *Harpanthus scutatus*, *Herzogiella seligeri*, *Bazzania trilobata*, *Calypogeia integristipula*, *Hygrobiella laxifolia*, *Jungermannia hyalina*, *J. obovata*, *J. paroica*, *J. pumilum* and *J. sphaerocarpa*, and also *Radula complanata*, *Scapania umbrosa* and *Tritomaria exsectiformis*. Fen Bog has thirteen *Sphagnum* species and *Philonotis caespitosa*, *Barbilophozia atlantica*, *Cephalozia macrostachya*, *Cladopodiella fluitans* and *Trichocolea tomentella*, whilst recent finds in the gills and griffs include *Brachydontium trichodes*, *Pohlia lutescens*, *Seligeria recurvata*, *Nowellia curvifolia* and *Jungermannia subelliptica*.

Several days will be spent in limestone country, where *Apometzgeria pubescens*, *Porella arboris-vitae* and *P. platyphylla* may be found. Further westwards, Duncombe Park NNR and Ashberry Meadows should be visited. If there is sufficient interest, a visit to Ingleby Greenhow can be arranged to see *Mielichhoferia elongata*. It would be nice to re-find *Coscinodon cribrosus*, *Discelium nudum* and *Dicranella subulata* from here, not seen for many years. If time permits, we could visit Wass Bank to look for *Seligeria diversifolia*. Other bonuses would be *Acaulon muticum* and *Phascum floerkeanum* in stubble fields, not seen since the 1967 meeting.

SUMMER FIELD MEETING 1997 (II), North Italian Alps, 1-10 August (approx.).

Local secretary: Dr Luca Miserere, Departimento di Biologia Vegetale del Università, Viale Mattioli 25, I-10125 Turino, Italy. Fax: 00 39 11 655839.

The Italian Western Alps are not well known from the bryological point of view. There are many different habitats with a very interesting vascular flora, rich in endemic species, and probably also an interesting bryoflora, but there have been few bryological studies. It is hoped to visit a varied selection of habitats, including some well studied alpine bogs rich in bryophytes and the Valli di Lanzo, Susa and Chisone (Alpi Graie e Cozie). The bryophyte flora of most of these is sure to be rich but is at present unknown.

Note change of date and local secretary.

ANNUAL GENERAL MEETING AND SYMPOSIUM MEETING 1997, Chichester, 12-14 September.

Local secretary: Mr Rod Stern, Botany Bay, Main Road, Fishbourne, Chichester, West Sussex, PO18 8AX. Tel.: 01243 574318.

This meeting will take place in the Chichester Institute of Higher Education at Bishop Otter Campus. This is a college in a pleasant location with excellent modern accommodation and facilities. The city centre is within walking distance. Chichester is a very historic and attractive city and the Festival Theatre is also a major feature. There are other interesting places to visit in the Chichester area such as the open-air Weald and Downland Museum and Fishbourne Roman Palace. The College has indicated that any member who wishes to stay an extra night(s) may do so.

The field meeting on Sunday will be to one of the richer bryophyte areas in West Sussex, probably near Midhurst. On the Saturday night, it is proposed to have a celebration dinner to mark the 80th birthday of Dr Harold Whitehouse.

Members who wish to make their own arrangements for accommodation may like to know that there is a good selection of B. & B. places (*ca.* £15 per night) within easy walking distance of the College.

BRYOLOGICAL WORKSHOP 1997, London (date to be announced).

Local secretary: Dr Ken Adams, Department of Biology & Biochemistry, University of East London, Romford Road, London, NE15 4LZ. Tel.: 0181 5907722. Topic to be announced.

SPRING FIELD MEETING 1998, Basse Normandie (Lower Normandy), France, March/April.

Local Secretary: Dr Jeff Bates, Department of Biology, Imperial College at Silwood Park, Ascot, Berks., SL5 7PY. Tel.: 01344 23911. Fax: 01344 294339. e-mail: J.Bates@ic.ac.uk

The meeting will be of one-week's duration and organized along similar lines to the Brittany Field Meeting in 1993, probably in the week preceding the main Easter holiday and running from Saturday to Saturday. The headquarters hotel will (provisionally) be in the seaside town of Granville, which is probably the most central and pleasantly situated of the possibilities. There are convenient ferry crossings to Cherbourg, Caen and even St Malo.

The excursions will be into the departements of Manche, Calvados and Orne and include the rugged Cotentin Peninsula with similarities to Brittany, and the undulating and pleasantly wooded bocage countryside which has been likened to the English landscape as it was 50 years ago. There have been many Atlantic species recorded on this extension of the Armorican Massif and preliminary investigations by Jeff Bates suggest that there is still a lot to find. The main previous work is the flora for Manche by Corbiére in 1889 and recent studies by Alain Lecointe of Caen University. It is hoped that the party will be able to visit coastal cliffs and dunes near Granville and further north on Cotentin; the main forest and heath areas in Calvados and Orne including the Normandie-Maine Regional Park area; the sandstone gorges of the Orne valley which have some Mediterranean-Atlantic species and the granite ravine of the Vire; bogs in Manche (peat is used to fire a power station here); rocky hillsides; and a day trip to the French Channel Islands – Iles Chaussey. There will be many opportunities to study epiphytes on town trees and stubble fields, and to visit interesting sites like Mont St Michel.

LOCAL MEETINGS PROGRAMME, 1997

BRITISH BRYOLOGICAL SOCIETY AND NORTH WESTERN NATURALISTS' UNION (North West Group)

March 22: **Miller's Dale DWT reserve**. Station Car Park, SK 137 733. Leaders: Prof. B.W. Fox and Mr George Challenger.

April 12. **Loggerheads Country Park**. Visitor Centre, SJ 19 62. Leader: Mrs Wendy McCarthy.

April 26. **Ricklow Dale**. SK 163 668. Leader: Dr Martha Newton.

May 10. **Chee Dale DWT reserve**. Station Car Park, SK 137 733. Leaders: Mrs Pat Brassley & Mr Tony Smith.

June 14. **Haslingden Grange**. SD 751 231. Leader: Mr John Lowell.

July 19. **Hollingworth Clough**. Lay-by, SK 033 890. Leader: Mr Tony Smith.

August 30. **Dinckley (Ribchester)**. Car Park, SD 675 356. Leaders: Messrs Alan & Norman Bamforth.

September 27. **Longworth Clough & Oak Field**. Roadside, SD 693 156. Leaders: Dr Martha Newton & Mr Roy Rhodes

October 18. **Tunnel End - Marsden**. SE 040 120. Leaders: Messrs Alan & Norman Bamforth.

November 15. **Lindow Common**. Car Park on A538, SJ 83 81. Leader: Mr Len Johnson.

December 6. **Eastwood Nature Reserve**. Fern Bank (off Mottram Road), SJ 972 979. Leader: Mrs Helen Perkins.

All meetings are on Saturday and the meeting time is 10.30 am unless otherwise arranged. Please advise one of the contacts given below (well before the meeting date!) of proposed attendance, to ensure that there have been no changes in time or venue. On some meetings there may be limitations on numbers or difficulties with parking or the terrain may be rough. Adequate clothing and refreshments must be taken.

CONTACTS: British Bryological Society: Mr A.V. Smith. Tel.: 01663 744499
North Western Naturalists' Union: Mr E.P. McCann. Tel.: 0161 962 1226

OTHER BRYOLOGICAL MEETINGS, 1997

March 1, 1997: MEETING TO LAUNCH PREPARATION OF NEW FLORA OF SOUTH LANCASHIRE. This joint effort by members and friends of the North Western Naturalists' Union is intended to cover bryophytes as well as vascular plants, fungi and lichens. The meeting will be held at Liverpool Museum. Details from Dr A.S. Gunn, Department of Botany, Liverpool Museum, William Brown Street, Liverpool, L3 8EN.

March 7 - 9, 1997: INTRODUCTION TO MOSSES AND LIVERWORTS. Tutor: Dr Martha Newton, Rhyd-y-creuau, Drapers' Field Centre, Betws-y-coed, Gwynedd, LL24 0HB. Especially for beginners, but others welcome too. Details from the Warden, Mr J. Ellis.

March 13 - 17, 1997: AN INTRODUCTION TO MOSSES. Tutor: Dr Martha Newton, Dale Fort Field Centre, Haverfordwest, Dyfed, SA62 3RD. For beginners. Details from the Warden, Mr J. Cremona.

April 18 - 20, 1997: *SPHAGNUM* WEEKEND. Tutor: Dr Martha Newton, Rhyd-y-creuau, Drapers' Field Centre, Betws-y-coed, Gwynedd, LL24 0HB. A chance to learn how to recognize most of the British species in the field, and to study them alongside keys. Details from the Warden, Mr J. Ellis.

May 14 - 21, 1997: MOSSES AND LIVERWORTS. Tutor: Dr Martha Newton, Orielton Field Centre, Pembroke, Dyfed, SA71 5EZ. Offering individual guidance at all levels. Details from the Warden, Dr R.G. Crump.

July 12 - 19, 1997: MOSSES AND LIVERWORTS. Tutor: Dr Martha Newton, Kindrogan Field Centre, Enochdhu, Blairgowrie, Perthshire, PH10 7PG. Offering individual guidance at all levels. Details from the Warden, Dr A. Gimingham.

August 1 - 8, 1997: MOSSES AND LIVERWORTS. Tutor: Dr Martha Newton, Preston Montford Field Centre, Montford Bridge, Shrewsbury, Shropshire, SY4 1DX. Offering individual guidance at all levels. Details from the Warden, Ms S. Townsend.

August 9 - 16, 1997: MOSSES AND LIVERWORTS OF THE LAKE DISTRICT. Tutor: Dr Martha Newton, Blencathra Field Centre, Threlkeld, Keswick, Cumbria, CA12 4BR. Offering individual guidance at all levels. Details from the Warden, Dr R. Lucas.

August 22 - 29, 1997: MOSSES AND LIVERWORTS. Tutor: Dr Martha Newton, Malham Tarn Field Centre, Settle, North Yorkshire, BD24 9PU. Offering individual guidance at all levels. Details from the Warden, Mr K. Iball.

September 5 - 12, 1997: UNDERSTANDING CONSERVATION THROUGH MOSSES. Tutor: Dr Martha Newton, Rhyd-y-creuau, Drapers' Field Centre, Betws-y-coed, Gwynedd, LL24 0HB. Offering individual guidance at all levels. Details from the Warden, Mr J. Ellis.

REPORTS OF LOCAL MEETINGS

South-east Group

RICHMOND PARK (VC 17), 20 January 1996. Leaders Jeff Duckett & Mike Lock.

About 15 members and friends met at the Broomfield Hill car park in Richmond Park, on a morning marred by a biting east wind. The aim was to add to the list accumulated by Mike Lock over the previous two years. Richmond Park is the largest of the Royal Parks; it was enclosed by Charles I and has been heavily grazed by deer ever since. Areas of open acidic grassland (partly ploughed for wartime crop production) are interspersed with plantations of various ages, mostly fenced against deer.

We moved first to one of the older parts of the Park wall, where *Bryum radiculosum* grew on the mortar, accompanied by *Tortula muralis* and, at the base of the wall, its var. *aestiva* and *T. marginata*. Then we went to some short grassland with *Bryum rubens* on the bare tops of anthills. An extremely sticky clay slope nearby was very species-poor and a trampled area of soil also yielded nothing new. The next area searched was an area of *Molinia* grassland wetted by seepage; here *Aulacomnium palustre* was abundant including gemmiferous plants. *Sphagnum recurvum* was also found here. On the sandy road verge there were large clumps of *Tortula ruralis* subsp. *ruraliformis* and some *Bryum microerythrocarpum.* On the way back to the car park *Grimmia pulvinata* was found on an elder branch, and was seen later on an oak root. This unusual association may be due to extreme acidity of bark in this suburban area. *Campylopus introflexus* was abundant on the trunks of fallen oaks.

After lunch we looked for *Pallavicinia lyellii* and duly found it in quantity, together with *Sphagnum fimbriatum* and *Eurhynchium speciosum,* around the bases of Molinia tussocks near a stream. We failed to find *Philonotis caespitosa*; areas normally suitable for it had been very heavily trampled by deer. We returned through Isabella Plantation, admiring a very large *Hamamelis* in full flower, and finding abundantly gemmiferous *Isopterygium elegans* by a stream. The nineteen species added to the Park list brings it up to some 82 species; members were generally surprised both by the diversity of habitats in the Park and the bryophyte species seen.

MIKE LOCK

SELSDON WOOD/SOUTH HAWKE (VC 17), 6 October 1996
Selsdon Wood Nature Reserve is an area of mixed woodland and chalk grassland. This proved excruciatingly dull bryologically owing to a combination of people pressure, shrub encroachment and insufficient management. Hutchinsons' bank nearby proved equally dire, and with all eight participants muttering that this was the nadir of the group's activities a radical rethink was needed. After an early lunch the party decamped to the beechwoods topping the North downs at South Hawke.

Here there was something of interest for everyone. To delight the arabologists *Ephemerum recurvifolium* extended over several square metres on a path above the railway tunnel. This path led to an area of chalk grassland with quantities of *Entodon concinnus* and *Thuidium abietinum*, and then into mature elders and *Sorbus aria. Here* the epiphiles had a field day. The liverworts included *Metzgeria temperata* and *M. fruticulosa*, *Cephaloziella divaricata* and gemmiferous *Lophocolea heterophylla* (conf. J.A. Paton) whilst the most interesting

mosses were *Dicranum montanum,* massive plants of *D. tauricum* and sheets of *Bryum subelegans* bursting with gemmae.

JEFF DUCKETT

CHURCH WOOD, BLEAN (VC 15), 26 October 1996

The Blean includes large areas of woodland on London Clay overlying the Chalk north of Canterbury. It is the British stronghold of the Heath Fritillary Butterfly.

We met with the main purpose of comparing bryophyte communities in different habitats. This was done by concentrating on the dominant or co-dominant species, thus covering the ground more quickly than is usual in our meetings! Church Wood is mainly semi-natural broad-leaved – coppiced, mature and replanted – with some conifer plantations, acid grassland and heath. On the permanently open areas, the dominant moss was *Hypnum jutlandicum* with *Polytrichum juniperinum* and varying amounts of *Campylopus introflexus.* The mature Oak and Beech woods held mostly *Mnium hornum* and *Hypnum cupressiforme* var. *cupressiforme* with lesser amounts of *Isothecium myosuroides, Thuidium tamariscinum* and *Dicranum scoparium.*

In other woodland types the bryoflora varied according to shrub layer, soils and topography. The recently planted Oak and Gean containing much bramble and bracken, had just occasional patches of *Eurhynchium praelongum,* whilst Western Hemlock plantations contained no bryophytes at all. The 'best' bryophyte areas were hilly areas where Head Brickearth fills valleys and the Chalk is exposed in cuttings and tracks. Although the clay is mostly acid, flushes from the underlying chalk allowed *Pellia endiviifolia, Pohlia wahlenbergii* and (as a possible new 10 km square record) *Riccardia chamedryfolia. One* such flushed ditch was surprisingly close to a small pond surrounded by Broom, filled with Greater Reedmace and edged with *Sphagnum auriculatum var. auriculatum.*

MALCOLM WATLING

CHEVENING PARK (VC 16), 24 November 1996

By kind permission of the Estate Manager, the Group was able to explore the steep chalk bank in an area normally private. At the top of the slope in mixed woodland was a good range of the usual species with *Orthotrichum lyellii, O. diaphanum, O. affine, Thamnobryum alopecurum, Dicranum tauricum* and *Zygodon conoideus. Metzgeria furcata* and *M. fruticulosa* were both present on old Elder branches.

More exciting was the grassy bank; over-grazed (a flock of sheep were continuing the good work as we watched) so that patches of the turf were bare. Here were *Weissia sterilis, W. longifolia, Fissidens incurvus, Pottia recta* and the even more minute *Phascum floerkeanum,* while *Phascum cuspidatum* was often the dominant plant.

In the turf itself we found *Fissidens cristatus* and much *Homalothecium lutescens* but no *Ctenidium molluscum, Entodon concinnus* or *Thuidium abietinum* — interesting absences because they are usually present on North Kent downs. Sadly, cold miserable rain and poor visibility restricted the time available and the site may be worth a further visit.

ROY HURR

KINGSWOOD nr. LENHAM, KENT (VC 15) 14 December 1996
There had been a sharp frost overnight, and the frosted bryophytes sometimes caused confusion until thawed out. However, sunshine took the chill off both ground and bryologists, and certainly gave good light.

We confined our attention to 1 km square TQ8451. The wood lies on the Lower Greensand, on a layer of clay and cherty loam overlying calcareous ragstone. Much of the wood is Chestnut coppice, but this square includes some old Oak coppice and areas which have become rather bare and reminiscent of poor quality heath. Deep ruts left by tractors gave a variety of niches. Within a few minutes we were delighted to find *Scapania nemorea* at the top of the trackside bank, whilst *Jungermannia gracillima* was common. The speciality of the area which we hoped to re-find was *Atrichum angustatum* which Francis Rose recorded in the 1950s, although we did not know from which part of this extensive woodland. Malcolm Watling spotted a patch of fruiting *Atrichum* with rather short setae, and after examining it at home was delighted to pass on the news that it was indeed *A. angustatum.*

The few standards in the wood are vertical young Oaks with bark dominated by pollution-loving species such as the alga *Pleurococcus. However*, in the Oak coppice we found a few tufts of *Ulota crispa* var. *crispa. Aulacomnium androgynum* was sparse in coppice stool hollows. A shaded area produced *Cephaloziella divaricata* forming sheets on the compacted path with a little *Calypogeia muelleriana, Polytrichum formosum* by the side of the path and *Tetraphis pellucida* on a rotting stump.

The heathy areas were dominated by *Polytrichum juniperinum, P. piliferum, Bryum pallens* and *Campylopus paradoxus,* with patches of *Campylopus pyriformis. Pogonatum nanum* was scattered except along one track where the sheets of its setae along the south-facing side of a rut were much admired. *Diplophyllum albicans* and *Cephalozia bicuspidata* were found at the bottom of the rut.

We ended at the old Parish boundary, marked by bank and flanking ditch. This had unfortunately been planted with a line of Chestnut stools, but as so often the older feature still held items of interest such as *Dicranum major*, with masses of *Isopterygium elegans.* At the end of the day a total of 47 species had been recorded for the grid square.

DAVID NEWMAN

The Border Bryologists, 1996

Fair-weather botanists time their *al fresco* activities to coincide with the cricket season, venturing out for primroses, and scuttling back indoors with the dead-heads. But there also thrives a hardier species of botanist, one who braves the vagaries of wintry weather to admire mosses and liverworts, whose demure hues endow the umbered hills and vales with a charm showing to best effect in the soft light of winter–a botanical pleasure denied to naturalists familiar only with the harsher light and gaudy colours of summer.

Most mosses and liverworts like it best when there is an 'R' in the month for Rain. They hold this element in higher esteem than warmth or sunshine, which is also why bryophytes look greener on the Welsh side of the Border, and many species peter out further east. Remarkably, the hills of west Radnorshire take twice as much rainfall as land only 30 miles to the east.

This surprising statistic explains many of the distribution maps in the *Atlas of the bryophytes of Britain and Ireland*, as well as the westerly migration of eleven Border Bryologists to meet Ray Woods at Gellyrhydd Farm near Crickhowell in Breconshire for their first meeting of 1996. In a wet pasture above the farm a pale patch in the grass drew our attention to *Trichocolea tomentella*, but many of the day's 80-odd other contributions to the projected *Flora of Breconshire* came as we descended to the river below. Here, the liverworts included *Lejeunea cavifolia* and *Preissia quadrata*, and among the mosses the tiny leaves of *Heterocladium heteropterum* var. *heteropterum* and *Amblystegium tenax* drew notice, while *Eurhynchium schleicheri* on a shady bank by the river was confirmed microscopically by its narrow leaf-cells (only about 5µm across) and the projecting nerve. Its subterranean stems also distinguish it from its congeners and offer a further clue to its identity.

To end the day we briefly visited Cwm Coed y Cerrig National Nature Reserve where Jonathan Sleath pointed out *Platygyrium repens*, looking for all the world like *Hypnum cupressiforme* on a tree trunk in a wet willow-alder wood.

The beginning of March found us at the south-western extremity of the Long Mynd in Shropshire, making good a deficiency of records from the 10 km square SO38. The Long Mynd is a huge lump of relentlessly acidic, metamorphic, Precambrian rock, thinly covered with well-nibbled fescues and bent grasses. *Hedwigia stellata*, *Dicranella rufescens*, *Racomitrium canescens* (*sensu lato*), *Pohlia annotina*, *Grimmia trichophylla*, *Bartramia pomiformis*, *Barbilophozia attenuata* and *Scapania compacta* attested acidic ground, but someone found a base-rich pocket with *Trichostomum brachydontium*, and Ralph Martin came across *Cryphaea heteromalla* on the bough of an elder tree.

Lacking the company of an expert that weekend, the bryophytes sensed our uncertainty, turning insubordinate after capture in the field, and refusing to give their names, capitulating only after thorough interrogation under the bright lights of the microscope. While this was going on, the botanical language bore little resemblance to the temperate tones of the best Floras, but concerted scientific endeavour slowly transformed Anglo-Saxon opinion into a more polite list of Latin binomials.

Later in the day we moved off the slopes of the Mynd to a wet pasture and wood below, where *Sphagnum auriculatum*, *Plagiothecium curvifolium*, and the liverworts *Lophozia ventricosa*, *L. excisa*, *Aneura pinguis*, *Riccardia multifida*, *Jungermannia atrovirens*, *Scapania irrigua*, *S. undulata* and *Odontoschisma sphagni* gave interest.

On 21 April, Ray Woods led a meeting at Aberedw Rocks in the Wye valley, Radnorshire, where enthusiastic perusal of the base-rich mudstones provided a very different assemblage of species to those favouring the hard, acidic rocks of the Long Mynd.

Meadow Saxifrage (*Saxifraga granulata*) was looking very fine on the cliff-ledges, accompanied by the characteristically calcicolous mosses *Anomodon viticulosus* and *Ctenidium molluscum*. The liverworts were in good fettle too, with *Plagiochila spinulosa*, *Saccogyna viticulosa*, *Porella arboris-vitae*, *Marchesinia mackaii* and *Reboulia hemispherica*. The moss *Pterogonium gracile* was new to several in the party. *Trichostomum crispulum*, *Orthotrichum stramineum* and *Climacium dendroides* added variety, while for the less bryologically committed, Pied Flycatchers announced the arrival of spring, and a Slow-worm's repose beneath a sheet of corrugated iron was briefly disturbed by a crowd of nosy naturalists.

The day's play ended in a rather dry gorge to the south of Aberedw, where Ray introduced us to *Targionia hypophylla*, an uncommon liverwort with a grey-green thallus and rather gruesome-looking dark purple involucres. *Targionia* is much more frequent in Mediterranean countries than Wales.

The remainder of the summer was given over to vascular plants. Not until late October did a gang of four go out to play in the pouring rain at Comley Quarry near Church Stretton, Shropshire. This quarry is a small nature reserve of the Shropshire Wildlife Trust, with trees now shading the Cambrian sandstone and thin bands of limestone. Thirty-two species came to notice, including *Orthotrichum affine*, *O. lyellii*, *O. diaphanum*, *Encalypta vulgaris*, *Plagiomnium undulatum* and *Trichostomum brachydontium*.

After lunch we ventured around the east flank of The Lawley, finding *Climacium dendroides* in a wet flush with *Hydrocotyle vulgaris*, *Anagallis tenella* and *Galium uliginosum*. Further on, an interesting expanse of damp heath and rough pasture yielded *Barbilophozia attenuata*, with its leafy attenuated stems reminiscent of tiny hazel catkins. *Pedicularis palustris* and bog-mosses indicated moisture in the ground, and on a patch of bare soil grew an attractive acrocarp which gave every appearance of being new to science, untraceable through any key. Its proud finder was on the point of observing approved taxonomic procedure by naming it after the hill near to which it grew, when its picture infuriatingly appeared in Smith's *Moss Flora* next to the name of *Leptodontium flexifolium*.

November found us attending to another Shropshire Wildlife Trust nature reserve in the Hope Valley near the Stiperstones, an outing which confirmed our growing suspicion that bryodiversity is not the cardinal criterion for establishing local nature reserves in this part of the world. The Hope Valley reserve may have the geologists drooling over its Ordovician mudstones and siltstones 'with intrusions of acid tuffs', but the bryophytes were not impressed, and *Leucobryum glaucum*, *Radula complanata* and *Calypogeia muelleriana* were the best of a thin list of 22 species. What little interesting habitat there was seemed to be disappearing into a huge bonfire surrounded by gleeful conservationists. Bryological embarrassment was averted in a shady, sheltered ravine outside the nature reserve to the east of the main road, secluded and safe from ravages of marauding conservationists. Here grew *Neckera complanata*, *Chiloscyphus polyanthos*, *Lejeunea cavifolia* and *Scapania irrigua*, but we took early tea after accepting the offer of bad light.

For our final sally of the year we returned to the Wye Valley with Ray Woods, starting in civilized fashion with a coffee party at the old railway station at Erwood. In April we had explored the east side of the valley at Aberedw; now we made for the west side at Twmpath Common to record for Breconshire, where outcrops of rock engaged our attention on a mild morning. As at Aberedw, there must have been some basic minerals in the rock – at least, the calcicolous *Homalothecium lutescens*, *Fissidens cristatus*, *Trichostomum crispulum*, *Zygodon viridissimus* var. *stirtonii* and *Seligeria recurvata* thought so. To these Jonathan Sleath added *Rhabdoweisia crispata*, notable so far east, and many calcifuges, of which *Racomitrium affine* was worthy of notice. *Cynodontium bruntonii* has an interesting distribution in Radnorshire, occurring only in the west of that county. Of the liverworts, *Lejeunea lamacerina*, *Plagiochila spinulosa*, *Porella arboris-vitae* with its hot-tasting leaves, as well as the more widespread *P. platyphylla*, *Scapania irrigua* and *Tritomaria quinquedentata* drew comment. Seventy-two species went onto the recording card.

After lunch we crossed back into Radnorshire to the lower part of the Bachawy gorge, and explored the riverside and woodland. This was a shadier, wetter, and much more sheltered site than the rocky buttresses we had explored in the morning, and immediately we were finding the common pleurocarps of the tree-trunks and woodland floor. The water attracted *Fissidens rufulus*, a scarce or under-recorded species distinguished from the very similar *F. crassipes* by its cells less than 10µm wide, and the absence of cells with chloroplasts outside the border of the sheathing lamina on the leaf. Close by the browsing bryologists found *Oxystegus tenuirostris*, a moss of western proclivities, *Schistidium alpicola*, *Mnium stellare*, which lacks a border to its leaf, unlike its congeners, and *Bryum subelegans* (*B. flaccidum*), very like the common *B. capillare* but with long finger-like gemmae projecting from the axils of its leaves. The hepatics represented themselves with *Nowellia curvifolia*, *Radula complanata* and *Saccogyna viticulosa*, this last with a westerly distribution in Britain. But the light was fading, and we drew stumps for the last time in 1996. It was time to join the lounge-lizards at the winter's indoor meetings.

MARK LAWLEY

ELECTION OF OFFICERS AND ELECTED MEMBERS OF COUNCIL

Dr G.C.S. Clarke (Vice-President) will become President in 1998. The terms of ten other officers, the Treasurer, Bibliographer, Bulletin Editor, Conservation Officer, Curator, Librarian, Membership Secretary, Publicity Officer, Recorder for Hepatics and Recording Secretary, expire at the end of 1997, and their present incumbents are eligible for re-election. The three Elected Members of Council who retire at the end of 1997, Prof. D.J. Cove, Miss J.I. Hendey and Mr G. Stark, are not eligible for re-election in this capacity until two years have elapsed. Members are invited to submit nominations for Officers and Elected Members, sending them, in an envelope marked PRIVATE, to the General Secretary of the B.B.S., Dr M.E. Newton, c/o Botany Department, Liverpool Museum, William Brown Street, Liverpool, L3 8EN, to arrive no later than 16 August, 1997. A nomination must not be made without the consent of the person it is wished to nominate. If elections are needed, they will be held at the A.G.M. in Chichester, on 13 September, 1997.

RECORDING MATTERS 13

Since the last *Bulletin* (68) there have been a few changes to the list of Regional Recorders:

38: Mr T. F. Robinson, Beverley Cottage, Park Lane, Snitterfield, Warwickshire, CV37 0LS
48-52: Mr M. J. M. Yeo, Countryside Council for Wales, Plas Penrhos, Bangor, Gwynedd, LL57 2LQ
111: Mrs R. McCance, West End House, Burray, Orkney, KW17 2SS

I would like to welcome our new Regional Recorders, and thank Tim Blackstock for his stint with VCs 48-52, now handed over to Marcus Yeo. Also, I have been informed by Katie Cocking, that she is looking for someone else to take on VC 100, so if you are interested please let me know. This leaves the following vice-counties unadopted: 37, 39, 56, 71, 75, 85, 90, 91, 93-95, 106-109 and 112. Much of Ireland is also there for the taking.

Some time ago a number of Regional Recorders asked if they could have details of occurrences of bryophytes within their vice-county. The data is held by BRC and has been used to compile the series of atlases. Chris Preston is very pleased to supply data to Regional Recorders, but there have been problems due to staff pressures and other competing priorities for time. However, I understand that those who have already written to Chris requesting data should have something by the time you read this *Bulletin*. Once this small backlog is out of the way we can start thinking how data exchange can be improved in the future. It would be more efficient if Recorders could accept data on computer disk. However, I have no idea of how many of you have access to a PC and appropriate software. A simple way to accept data is by ASCII file that can then simply be downloaded onto a spreadsheet. An alternative is a database such as ADDITSITE, and the advice I'm getting is that there are some problems with RECORDER. Can you therefore let me know if you would like data on disc in ASCII form. I will then co-ordinate responses so Chris is not inundated with lots of separate requests.

Some members have asked me about the possibility of a Scottish (a better term would be Highland) card. Again BRC is happy to produce something, say a 500 to 1000 print run. If there is the demand for such a card then I will need some help in designing one. You will need to decide whether you want a Highland or Western card, or a combination of both. Remember the more species that are on a card the smaller the type face. You will also need to define the area, either by vice-county or 100 km square. The NE lowlands should clearly be excluded. Chris can then interrogate the database and determine which are the most frequently recorded species and those that are characteristic of the Highlands and/or western seaboard. Do let me know if anyone wants to proceed with this.

Current stocks of cards (RPs 22 and 23) are still available so if you need more do get in touch. I'm also waiting for all the completed cards to eventually find their way to me!

The recording activities of our members are always of interest to the Society as a whole, and I hope to occasionally feature a small contribution from members informing us of what they are doing bryologically. John Blackburn has kindly put pen to paper.

Bryophyte recording in NE Yorkshire (VC 62)

My interest in bryophytes started in 1990. At the same time as learning about these fascinating plants I decided to record occurrences on a tetrad (2 × 2 km square) basis in Cleveland. This coincides with the area covered by the Cleveland Wildlife Trust. After four years of recording in Cleveland I felt the need to extend the work and embarked, somewhat apprehensively, on the remainder of VC 62. This has never before been done in any systematic way. The 5000 records already assembled relating to that part of Cleveland south of the River Tees formed a useful basis for the project. This started seriously in late 1994 using the tetrad recording unit, one that I felt comfortable with. I bought a computer in January 1995 and use Dr Alan Morton's DMap for Windows package, which I am very happy with and which provides for speedy data entry. NE Yorkshire comprises some 903 tetrads. The area includes the whole of the North York Moors National Park occupying 359 square miles. This is where the main bryological interest lies. Outside the National Park the landscape is predominately agricultural, with extensive forestry and mining operations.

There is a long history of bryophyte recording in VC 62. Richard Spruce was very active in the mid 1800s, and many members of the Society have made contributions over the years.

The bulk of the records though come from the activities of the Yorkshire Naturalist's Union, founded in 1861. Its records have incorporated details extracted from Baker's North Riding Flora. Over 500 taxa have been recorded in VC 62, though many of these, such as *Paludella squarrosa*, are sadly long gone. The Y.N.U. holds a field meeting in VC 62 each year and its Bryological Section, led by Tom Blockeel, meets about every second year. The BBS summer meeting of 1967, led by Mary Dalby, was based in Northallerton and added many new records, mainly in the west of the county.

The ultimate aim of the survey is to publish a bryophyte flora for VC 62, although this sounds somewhat pretentious from someone with my limited experience. However, this is thinking many years ahead, as much recording remains to be done. The old records, mainly at the 10 km square level, have been incorporated into the appropriate 10 km file and I am happily working through these hoping to rediscover at least some of them. A total of 339 taxa have been identified since 1990 (including several new VC records) from 18000 records in 450 tetrads. Any records from members are welcome, preferably accompanied with grid references!

John M. Blackburn, 6 Bylands Grove, Fairfield, Stockton on Tees, Cleveland, TS19 7BG.

If any other members out there are engaged on a particular recording project, either in this country or abroad, do let me know.

Ron Porley, English Nature, Foxhold House, Crookham Common, Thatcham, Berkshire, RG19 8EL

COUNCIL NEWSLETTER NUMBER 13

The inauspicious nature of this newsletter's place in time is clearly at odds with the good news I have to tell you. You will read about some of it elsewhere in this *Bulletin*, but some, such as correspondence concerning back-numbers of the *Transactions* and *Journal of Bryology*, is still not finalized. However, there is much about which I can give you more information. In doing so, I would draw your attention to the fact that the vast majority of Council's recent endeavours have been directed towards encouraging and supporting bryological studies at every level.

Centenary meetings
Over ninety bryologists from around the world made the Glasgow symposium the success for which we had hoped. The symposium volume will therefore provide, not only a lasting record, but also a springboard for future studies. It promises to be a major international contribution to bryology. British bryology has also benefited this year, with a good geographical spread of field meetings having provided opportunities to update distributional data for the forthcoming *Census Catalogue*.

Lifescience *2000*
This conference, held at Warwick University for teachers of biology, was a fortuitous and welcome opportunity to encourage and support the use of bryophytes for educational purposes. Miss J.M. Ide and I, in representing the B.B.S., were delighted with the response our two sessions received. There is obviously a genuine interest in bryophytes as vehicles for

teaching biology in schools and colleges. The Publications Committee is therefore considering several ideas for fostering that interest.

Side Bequest Committee
Council is pleased that plans are now in place for the management of the fund which was established by the generous bequest from Mrs A.G. Side. It will be used to promote worthwhile projects, and applications for grants will be invited in this and future issues of the *Bulletin*.

E.W. Jones Bequest
You will recall that old microscopes bequeathed to the Society were very successfully sold at Christie's. Council has now authorized the purchase of modern microscopes, which will be lent, in accordance with Dr Jones' wishes, to young B. B. S. members.

Dawyck Cryptogamic Reserve
Edinburgh Botanic Garden had plans to reach out to members of the public by converting its satellite garden at Dawyck, near Peebles, into a cryptogamic reserve. Council, on your behalf, responded enthusiastically to an invitation to become involved. The garden is now open, enabling visitors to enjoy plant communities in a semi-natural environment. We hope that information about bryophytes and the B.B.S., which is also available to visitors, will add to their enjoyment and promote, in particular, an interest in this group of plants.

Minute Books
Recording the business conducted by Council and the A.G.M. throughout the Society's history, are three old minute books and one which is current. At the request of the A.G.M., the first three have been placed in matching livery. All are blue, and lettered along the spines in gold. Rather than re-bind the first two, they have been placed in custom-built pamphlet boxes, but the third has been re-bound.

Internet
To bring the Society abreast of modern technology, Mr B.J. O'Shea, with the help of others, has succeeded in establishing a World Wide Web site for the B.B.S. It is kindly hosted and edited by the Royal Botanic Garden, Edinburgh, and is being overseen by Mr D.G. Long.

Very many members are currently helping Council to achieve those benefits which help to secure the Society's success and the future of bryology. Please continue to do so, as a progressive Society depends on joint effort.

M.E. NEWTON

REFEREES (February 1997)

The refereeing service is intended to provide assistance to members who have genuine difficulty in naming their collections. **It is not intended as a 'free-for-all' identification facility,** least of all for bulk collections. Please therefore respect the following guidelines when submitting material.

◆ If possible, avoid sending large quantities at any one time. Do not send material if you are not prepared to examine it yourself in advance.

◆ Please ensure that fragile specimens are adequately protected in the Post. This applies particularly to material with lumps of soil attached. It is dispiriting to open a packet and find nothing but a pile of dust inside! Small boxes or tins are ideal for protection from crushing.
◆ Please label all packets clearly with full collection details, including habitat, locality, altitude and at least a 10 km grid reference.
◆ Always enclose a stamped addressed envelope (or label), even if material is sent from universities or institutions. Otherwise you may not receive a reply.

The General Referee will help beginners who are having difficulty in placing their material in a genus. If you encounter any other problems send it to the appropriate Recorder – Mr David Long for hepatics (Herbarium, Royal Botanic Garden, Edinburgh, EH3 5LR) or Mr Graham Rothero for mosses (Stronlonag, Glenmassan, By Dunoon, Argyll, PA 23 8RA).

The numbers below refer to genera in *Distribution of Bryophytes in the British Isles* by M.F.V. Corley & M.O. Hill (1981).

GENERAL REFEREE: H.W. Matcham, 21 Temple Bar, Strettington, nr. Chichester, W. Sussex, PO18 0LB

HEPATIC REFEREES:

1,2,11,12,38,53-55,58,64-67,69: D.G. Long, Herbarium, Royal Botanic Garden, Edinburgh, EH3 5LR

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

13-17,36,37,39-44: G.P. Rothero, Stronlonag, Glenmassan, By Dunoon, Argyll, PA23 8RA

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

48-52,78-86: M.J. Wigginton, Joint Nature Conservation Committee, Monkstone House, City Road, Peterborough, PE1 1JY

56,57,59-63,68,70-74: T.L. Blackstock, Nature Conservancy Council, Ffordd Penrhos, Bangor, Gwynedd, 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, Natural History Museum, 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 Biological Sciences, Brambell Building, University College of North Wales, Bangor, Gwynedd, LL57 2UW

39,67-81,96-104: N.G. Hodgetts, Joint Nature Conservation Committee, Monkstone House, Peterborough, PE1 1JY

40-61: Dr D.F. Chamberlain, Dept 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, Department of Botany, National Museum and Gallery of Wales, Cardiff, CF1 3NP

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

139-142,144-175: (vacant)

THE SIDE BEQUEST AWARDS

Council has decided that each year a number of awards will be available from Bequest funds with the object of promoting bryology and supporting bryologists in activities such as recording, attending meetings and undertaking fieldwork in Britain and abroad; and to enable the results of these activities to be published or otherwise disseminated. Awards will be limited to the amount received each year from January 1995 in interest from the Bequest fund capital. Funds available but not awarded may be held over for subsequent awards. Applications will be considered bi-annually with closing dates of 31 March and 30 September. A Bequest Committee has been set up to administer the scheme on behalf of Council. It has four members who will retire annually in rotation, with the Treasurer of the Society ex-officio. Naturally no member of the Committee may benefit directly or indirectly from an award except insofar as all Society members might benefit.

Awards may be made to members of the Society (preferably of amateur status) or, exceptionally, at the discretion of the Committee to individuals or organisations outside the Society. Awards may also be given to retired professional botanists or for work which does not form part of an applicant's professional employment. Applications may be sent to the Bequest Committee through the Treasurer (at present Roy Hurr) and should describe in appropriate detail how any award would be used, with a detailed budget. A brief description of the applicant's botanical background should be enclosed. The applications will be judged against the following criteria:

(a) how far the objectives above would be met
(b) the need for an award and alternative sources of funding for the activity proposed.

In return for any assistance given, the Society will expect an acknowledgement in any subsequent publication or a brief report on the activity for which the award was made.

J.G. DUCKETT

B.B.S. LIBRARY SALES AND SERVICE 1997

FOR LOAN (U.K. Members only):
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 and journals and several thousand offprints of individual papers. A catalogue of the books and journals is available, 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 minimize possible loss or damage.
(c) Microscope stage-micrometer slide for calibration of eyepiece graticules. 10µm divisions. Loan deposit £45.00.

FOR SALE:
British Bryological Society Bulletins: back numbers from no. 23 @ £1.00 each.
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Paton, J.A., 1966. Census Catalogue of British Hepatics, 4th edition (20p)
Corley, M.F.V. & M.O. Hill, 1981. Distribution of Bryophytes in the British Isles: a census catalogue of their occurrence in vice-counties.
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Kenneth J. Adams, 63 Wroths Path, Baldwins Hill, Loughton, Essex, IG10 1SH, U.K.

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HELP! – MISSING *JOURNALS OF THE HATTORI BOTANICAL LABORATORY*

The BBS library accumulated a complete run of the *J. Hattori Botanical Lab.* from Volume 1 through to Vol. 72 (1992), after which they ceased to arrive as complementary copies. *J. Hattori* has been in great demand by BBS members over the years, but being so heavy they have been handed over to members at BBS meetings rather than incurring the expense of postage. Unfortunately, for the same reason, members have asked if they could hand them on to other members, who would then theoretically return them to the Librarian. Since they were borrowed a box full at a time, the Librarian is now in the position of having lost track of the following: Vol: **31-39**, **47-51** (inclusive) and **53**, nobody being willing to admit they last had them! The BBS does occasionally inadvertently acquire members with severe cleptomania, and it has in the past been necessary to send in the heavies to actually knock on doors in places as remote as the Devon countryside. In this case however the sufferer is unknown and it may become necessary to summon demons to spirit the culprit(s) away to the nearest deep *Sphagnum* bog for internment. To avoid such a dastardly fate (and a pricking conscience for ever more), I suggest that a box with the missing Hattoris be made to appear quite anonymously at the Department of Life Sciences Office, University of East London, E15 4LZ. — ASAP, please! *Ken Adams, BBS Librarian.*

BBS TROPICAL BRYOLOGY GROUP – PROGRESS IN 1996

Future direction of TBG

This note will be published 12 years after Royce Longton's request in *BBS Bulletin* **45** (February, 1985) for people interested in forming a Tropical Bryology Group to contact him. It was not until September 1986 that an informal meeting of interested members met at the BBS AGM in Leeds, and of the 16 people who attended, three are now deceased, two are not actively involved, but the other eleven are still involved in various ways. A discussion paper was produced of possible ways in which we could contribute, and many of the suggestions in that paper have now been implemented. We were not to know how much this would change the direction of our activities, but it has certainly done that, both by giving a new impetus to our interest, and by that interest being directed more to the tropics than the UK. Nevertheless, a decade on, we are still working within that same framework and it seems time to re-examine our direction and activities. As a result of a suggestion at the TBG AGM in September 1996, we intend during this year to look again at our aims, objectives, activities and priorities.

Uganda expeditions

The first of the TBG trips to Uganda took place from January 19th to February 11th 1996, and six TBG members (Nick Hodgetts, Martin Wigginton, Ron Porley, Robin Stevenson, Howard Matcham and Jeff Bates) and two members of staff from Makerere University, Kampala (Stephen Byarujali and Berna Nakityo) visited Bwindi Impenetrable Forest National Park. There were two objectives: a bryophyte inventory and an ecological project. The inventory was made by recording and making collections in different parts of the forest, mainly during daily forays from the bases at Ruhija and Buhoma, but two members collected in more remote locations from a tented camp set up in the central part of the forest. Bryophytes were recorded and collected from as wide a range of habitats and communities as possible, including marginal habitats such as tracks and roadside banks bordering the National Park. As there was no means of access to the canopy, collections were taken from

any newly-fallen branches and twigs that were encountered. There were two ecological projects, a main (joint) project to investigate variations in bryophyte diversity and species ranges in relation to altitude within the forest (which involved making bryophyte lists for 5 delimited 30 × 30 metre square plots spaced along an altitudinal gradient) and a bryophyte communities project, to delimit the main recognisable epiphyte communities and relate their occurrence to major environmental factors such as altitude height on tree, slope of bark, type of substratum (which involved examination of 5 trees in each of the plots used for the main project). Everyone is identifying their own collections, and good progress is being made in this, but it will certainly not be completed within a year.

The 1997 trip (which will have taken place by the time you read this) has a busy schedule and involves a brief survey of a variety of montane forests in the SW corner of Uganda, and it is currently planned that the final expedition will concentrate on the montane forest on the Rwenzoris: this is a neglected area as most bryological activity has concentrated on the unusual and distinctive area above the tree line, but looks very promising in terms of the overall project.

Malawi expedition collections

In the meantime, the Malawi specimens have now largely been processed, although there are still a few hundred of the 4500 packets still awaiting identification to family level. A number of papers covering the results have already been published or accepted for publication, and more are in draft. Most cover not just the Mulanje specimens but also the taxa that might be found in a wider area (often all of tropical Africa) so should prove useful for Ugandan specimens also. Unfortunately fully up to date figures are not available, but so far the records show that we have 4593 specimens identified at least to family level, with 2169 identified to species level. We have added 156 new taxa to the Malawi list (raising it from 303 to 459). The number of specimens identified to family level is probably several hundred more than this, but it was not possible to get the information together in time for this note, and the final figure for specimens is likely to be around 6000 or more. Many families with large numbers of collections may not be identified for some time as they are with people expecting to do full taxonomic revisions.

Other news

Two TBG Newsletters were published in 1996 (numbers 10 and 11), but all 44 TBG documents are now available on the BBS World Wide Web (WWW) home page on the Internet. The TBG WWW pages also include some information that has not been published as documents, for instance the latest position on Malawi collection data, forthcoming papers, and a list of all 6000+ literature references quoted in *Tropical Bryology*. Four new members joined during the year, giving a membership of 50 (membership is free and is open to all BBS members).

It has now been agreed by Council that it will be necessary to pay an artist to produce illustrations for Eustace Jones' West African hepatic flora, but no date has been fixed yet for completion. With the publication in 1996 of Martin Wigginton's checklist of sub-Saharan hepatics (*Bryophytorum Bibliotheca* **50**), we now have checklists of both mosses and hepatics from all of the sub-Saharan Africa and the African islands.

Brian O'Shea, 141 Fawnbrake Avenue, London SE24 0BG
(email: brian@oshea.demon.co.uk)

BBS POSTCARDS

BBS postcards, now publicising the BBS, are still selling well, with 721 sets of 16 cards (11,536 cards) sold at the end of 1996. Still, we need to sell a further 91 sets to break even.

If you haven't bought your sets yet, and also if you have, each set of 16 colour postcards of British bryophytes costs only £2.95, which is 18½p a card. They have been bought by several major retail outlets, who are selling them for up to 30p per card. Order several sets and:

* publicize mosses and liverworts;
* help the BBS (we must sell more than one set per member to break even!);
* impress your friends;
* save money by not buying other more expensive cards.
* post them off to somebody (preferably not BBS members, who will already have some), and buy more!

The A6 cards are printed by Judges, and are laminated with semi-gloss anti-UV film. The photographs are the best 16 selected from 186 entries in the BBS photographic competition.

They will be on sale at the 1997 Spring meeting at Torquay.

Available from: Sean Edwards, Manchester Museum, Manchester University, Oxford Road, Manchester M13 9PL, U.K. Postage and packing 50p extra for one set, 60p for two, 70p for 3, and £1.00 for 4 sets (because of the bigger envelope). Also generally available at BBS meetings. Cheques payable to the British Bryological Society. 'Phone for more information: work 0161-275-2671, home 0161-442-9346.

BBS CAR STICKERS

As decided by Council, one sticker will be enclosed free with every copy of *Bulletin* **69**. Please use the sticker to best advantage. Apart from generally advertising the Society, a particular and practical request for stickers has been to enable members to recognize each others' cars at field meetings. I am told that they can also be used as a basis for personalized-mug or -sweatshirt designs, although I have seen no results.

The green and the brown colours were carefully chosen (Pantones 364 and 138) so that the words would be clearly visible on the background, without clashing too much. However, even the best-laid plans of moss and man can go awry, and the wording might best be described as subtle. I doubt that many tail-gating lorry-drivers on the M6 will be stopped in their tracks and induced to join, but then that wasn't reallythe purpose of the stickers, and maybe I malign the modern knight-of-the-road.

The stickers are self-cling; peel the sticker from the backing, or rather fronting, and it will cling very well to a clean glass surface. A little huff helps, as it does in most things in life. There will be some spare for anybody who wishes to have more than one (18 extra have already been sold); please enclose £1.00 (cheques payable to the British Bryological Society) per sticker requested, and an S.A.E. to take the three-inch roundel(s), to: Sean Edwards, The Manchester Museum, Manchester University, Oxford Road, Manchester M13 9PL.

BBS AND THE INTERNET

Elsewhere in this *Bulletin* is a description of a talk at the AGM, introducing the BBS on the Internet, but it gives very little information about what is on the BBS World Wide Web (WWW) pages. The main 'menu' of the BBS Web home page lists a number of topic areas, each of which is either a further menu (list) of items available under this heading, or a text document. The content of both menus and documents is subject to change and updating at regular intervals, and some of it will certainly have changed between the time of writing (December 1996) and the time you read this. The structure and maintenance of the data is being managed by the two individuals named below, with David Long being appointed by Council to be responsible for structure and content, and Brian O'Shea for the technical aspects of preparing documents for uploading to the Web. Input is thus sought from the membership on what should be on the Web.

At present the content is the pragmatic result of adding any document available in electronic form, but this obviously is only a first step to a more coherent presentation of information that will attract both members and non-members to the site. Attracting non-members is important both in enhancing the reputation of the Society as well as encouraging people to join. The Tropical Bryology Group (TBG) section provides the largest number of pages as there was a ready-made set of document to load, and probably it will be necessary to commission a set of documents about other aspects of the Society's affairs: it is hoped Council officers will be able to provide suggestions about how their own area can be developed. Any suggestions about what you would like to see (or not to see) to David Long.

The present main menu contains entries for General Information and Membership, Future Meetings, BBS Safety Code, International Association of Bryologists, Reading Circle, Recording, Conservation, Links to other sites, Trudy Side Bequest, Tropical Bryology Group, BBS Official and Publications and Sales. As examples, clicking on the 'BBS Official' menu item takes you to a choice of three further items: Membership of BBS Council, BBS Rules and Duties of Council Officers and Members, whilst others such as 'Reading Circle' just take you to a document describing the Reading Circle.

It is hoped that the WWW pages will become a repository of information about the Society, holding information that is not always easy to find, for instance a list, by year, of where the Society has been for its meetings, or information that may be updated more frequently than the *Bulletin* is published, such as the latest responsibility list for recording by vice-county, or for refereeing specimens. It will take some time to achieve this, but there are already over 60 documents loaded, and changes and additions are made most weeks. This will not replace the *Bulletin*, as it recognized that most members will not have access to the Web, certainly in the near future, but it is a resource that will become increasingly used by members, and may be the only place where the information is to be found.

Any suggestions or offers of assistance are welcome.

David Long, Royal Botanic Garden, Inverleith Row, Edinburgh EH3 5LR
Brian O'Shea, 141 Fawnbrake Avenue, London SE24 0BG

BRYOPHYTE PICTURES ON THE INTERNET AND ON CD-ROM

Those members who have given their offspring new computers for Christmas will I am sure already be aware that it is now possible to down-load high quality full-colour pictures of fungi and lichens from the Internet. New computers also have CD-ROM drives and we therefore have the potential to disseminate high quality pictorial information either via the Internet or by disc.

The BBS library catalogue is slowly being updated and put on a computer file, and will be available shortly in continuously updated form on the Internet. In addition, however, the BBS library has a rather fragmentary and variable quality 35 mm slide collection, which members borrow at 50 slides at a time.

Most members who borrow the BBS 35 mm colour slides use them for lectures or talks. Transparent computer screens are now available which fit over the top of overhead projectors, so that the image can be projected onto a screen, and many University lecturers now use these as a routine teaching aid. When 50 of our best slides went astray in the post last year (but eventually turned up), it occurred to me that what we should be doing is getting ourselves prepared for the new information explosion by assembling a systematic collection of 35 mm slides of habit shots, light microscope and electron micrographs, of all our British (or even better, all European) bryophytes, together with the best line drawing illustrations available for each species (taking care to seek copyright permission).

Before putting this idea formally to the BBS Council for adoption as a BBS (or possibly a European) bryological project, I would like to hear from rank-and-file members to gauge just how popular such a resource would be. We could for example trawl for pictures of a group of bryophytes at a time via the *Bulletin*, starting say with the Sphagna. We need, however, to get some idea of just how many members have suitable computers, or are likely to acquire them over the next few years, to take advantage of such a resource.

Ken Adams. BBS Librarian.

POTTIACEAE WANTED

We have started a study on the application of some molecular techniques in mosses. We have decided to start with some species of the genus *Pottia* with rostrate lids and for our experiments we need material from different continents. We would therefore be very grateful if you could send us recently collected British specimens of *P. intermedia*, *P. truncata*, *P. lanceolata*, *P. crinita* and *P. wilsonii*. Also we would appreciate any other good material of the Pottiaceae. Fresh material is especially requested, but herbarium material no more than 8 years old would also be acceptable.

For our laboratory experiments we need approximately 5-7 undehisced capsules, but we will study the material morphologically too. Thank you very much for your help.

Rosa María Ros and Juan Gonzalez, Departamento de Biología Vegetal, Facultad de Biología, Universidad de Murcia, Campus de Espinardo, 30100-Murcia, Spain. Fax: 34-68-363963. E-mail: rmros@fcu.um.es

HYLOCOMIUM SPLENDENS WANTED

I would be very grateful to receive specimens of *Hylocomium splendens* either from UK or abroad. I am particularly interested in collections from arctic or mountainous environments. If possible please send fresh specimens in ziplock bags. Dried specimens should not be flattened. Postage will be refunded.

Sarah Ross, 3.614 Stopford Building, Oxford Road, University of Manchester, M13 9PT

NEW HEPATIC FLORA OF THE NETHERLANDS

S.R. Gradstein & H.M.H. van Melick (eds.), September 1996. *De Levermossen en Hauwmossen van Nederland* [Hepatic flora of The Netherlands]. Published by the Dutch Bryological & Lichenological Society, 368 pp., 140 plates, 126 maps. Price D.fl. 75,- including postage.

This Flora is the first full scientific account of the liverworts and hornworts of The Netherlands. The work contains keys to the families, genera and species, descriptions and notes on distribution, habitat, variation and recognition. Full-page illustrations of all the species by J. Landwehr and M. Aptroot as well as dot maps showing the distribution of the species in the Netherlands accompany the text. The flora is based on a complete revision of the holdings of the Dutch herbaria (ca. 30,000 specimens) and was prepared by a team of bryologists. An introduction with chapters on the morphology, anatomy, classification, distribution and conservation of the Dutch liverworts and hornworts is also provided. The text is in Dutch.

The book can be ordered as follows:
1. By payment of D.fl. 75 to Postal Giro 2753451, The Netherlands, addressed to the Treasurer of the Bryological & Lichenological Society, Driebergen.
2. By mailing an international (Euro)cheque for D.fl. 75 to the Treasurer of the Bryological & Lichenological Society, F. van Gelder, Vossenkamp 24, 3972 VJ Driebergen, The Netherlands.

IS *HABRODON* STILL AT KILLIN?

Our member Robin Stevenson was browsing through Braithwaite the other day and came across an entry on *Habrodon perpusillus* on a plane tree outside the hotel in Killin [VC 88]. He would like to know if the tree is still there, and does *Habrodon* still grow on it, as first found by Schimper. If there is still a plane tree. and it hosts *Habrodon*, Robin writes, should we not be thinking about the bryological equivalent of a Blue Plaque?

Grimmia tergestina Tomm. with sporophytes in Britain

R.D. PORLEY

English Nature, Newbury, England.

On 12 August 1996, during the BBS summer meeting in Scotland, a small party including Henk Greven and Tony Smith, visited some crags known as Creag an Sturra, by Loch Melfort, to re-find *Grimmia tergestina*, recently reported new to Britain (Greven, 1994).

G. tergestina was found at a number of spots on a large dome shaped Andesite crag, on a southern aspect at 200 m altitude. Close associates on the basic rock included *Tortella tortuosa*, *Frullania tamarisci* and *Zygodon baumgartneri.* Both female and male plants of *G. tergestina* were seen, and furthermore capsules were present on a few cushions. This is the first report of sporophytes in this species for Britain.

G. tergestina is only rarely fertile in Europe (Sotiaux *et al.*, 1988) and sporophytes are not known in Belgium, France or The Netherlands (Greven, 1991). Only female plants are known from Belgium and N. France, whilst only male plants are known from The Netherlands. The presence in Scotland of both female and male plants, and sporophytes, supports the contention that *G. tergestina* is not a recent colonist here, but represents a disjunct native population of an otherwise typically southern European species.

Blockeel (1996) has established that *G. tergestina* occurs at four localities in western Scotland: Creag an Sturra and Dun Crutagain, both by Loch Melfort, and Rubha na Feundain, Kerrera (Argyll, VC 98) and Carsaig Bay, Isle of Mull (Mid Ebudes, VC 103). Sporophytes were not found in any of the material he examined. It is quite likely that *G. tergestina* may occur on other suitable crags by the coast, particularly since it would appear that the plant can disperse by spores.

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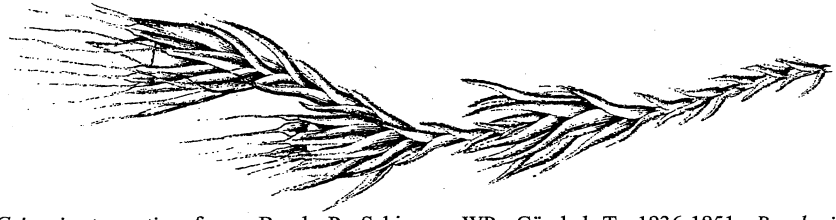

Grimmia tergestina from: Bruch P, Schimper WP, Gümbel T. 1836-1851. *Bryologia Europaea*. Stuttgart: Sumptibus Librariae E. Schweizerbart. Vol. III, Tab. XXI.

WILLIAM BORRER, 1781-1862

On 6 November 1996, a plaque to the famous Sussex botanist William Borrer was unveiled at his birthplace at Potwell, Henfield, by BBS member Prof. Mark Seaward who later gave an excellent 45-minute lecture on Borrer's life and work. There was a walk to Barrow Hill to which Borrer moved on his marriage, where some of his specimen trees still survive, although the house is now demolished. Guests also visited the small museum in the Village Hall, which contains an exhibit on Borrer. Amongst an audience of more than 60 invited guests were two other BBS members, Brian O'Shea and Rod Stern.

Commemorative plaque to William Borrer at Henfield, Sussex, with, left to right, Nigel Borrer Orlebar, great-great grandson of William Borrer, Bill Cantello, current owner of William Borrer's home at Potwell, and Mark Seaward, who performed the unveiling ceremony. (Photo: David Nicholls, Selsey.)

Although better known for his work on lichens and flowering plants, Borrer was a competent bryologist and contributed many early Sussex records including many of those published in Turner and Dillwyn's *Botanist's Guide* published in 1805 when Borrer was still a young man.

BRIAN O'SHEA

CHANGES TO THE MEMBERSHIP LIST, JANUARY 1997

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Apostolakos, Professor P., Institute of General Botany, University of Athens, Panepistimiopolis, Athens, GR 15784, Greece.
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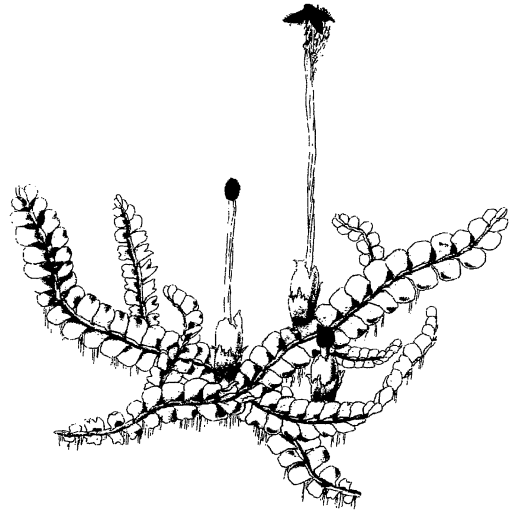

Jungermannia polyanthos.