



ISSN 0142-3169



**PUBLISHED BY THE BRITISH BRYOLOGICAL SOCIETY
PETERBOROUGH**

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.

The subscription, due in advance on 1 January each year, is £20.00 for Ordinary members; £10.00 for Senior members, Junior members and Student members; and £1.00 for Family members (who do not receive the *Journal*).

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BULLETIN EDITOR: Mr M.J.M. YEO, Joint Nature Conservation Committee, Monkstone House, City Road, Peterborough, PE1 1JY.

BIBLIOGRAPHER: Mr L.T. ELLIS, Department of Botany, The Natural History Museum, Cromwell Road, London, SW7 5BD.

CONSERVATION OFFICER: Mr D.T. HOLYOAK, 8 Edward Street, Tuckingmill, Camborne, Cornwall, TR14 8PA.

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PHOTOGRAPH ARCHIVIST: Prof. M.R.D. SEAWARD, Postgraduate School of Studies in Environmental Science, The University, Bradford, BD7 1DP.

DOCUMENT ARCHIVIST: Mr A.R. PERRY, Department of Biodiversity & Systematic Biology, National Museum & Gallery Cardiff, Cathays Park, Cardiff, CF1 3NP.

British Bryological Society web address:
<http://www.rbgc.org.uk/bbs>

The cover illustration is of *Grimmia conferta* (*Schistidium confertum*) from T. XLVI in R. Braithwaite's *The British Moss Flora*, Vol. II, 1888-95 (see pp. 42-49 of this *Bulletin* for an account of the *S. apocarpum* complex in the British Isles).



BULLETIN OF THE BRITISH BRYOLOGICAL SOCIETY

NUMBER 74

FEBRUARY 2000

ISSN 0142-3169

Editor: M.J.M. Yeo, Joint Nature Conservation Committee, Monkstone House, City Road, Peterborough, PE1 1JY, UK; e-mail: yeo_m@jncc.gov.uk.

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ARTICLES FOR *BULLETIN* 75

Items for inclusion in the August 2000 issue of the *Bulletin* should be sent to me at the address below by **9 June 2000**. Wherever possible, material should be provided as word-processing files, either on disk or by e-mail.

Marcus Yeo, Joint Nature Conservation Committee, Monkstone House, City Road, Peterborough, PE1 1JY; e-mail: yeo_m@jncc.gov.uk.

TREASURER'S REPORT FOR 1998: CORRIGENDUM

The Treasurer's report for 1998, published in *Bulletin* 73: 5-7 has two figures which were printed incorrectly. In paragraph 1, line 2, '£424' should read '£542'; in paragraph 2, line 1, '£10,414' should read '£10,230'. The accounts printed in *Bulletin* 73: 2-3 are correct.

SUBSCRIPTIONS FOR 2000

Subscriptions were due on 1 January 2000 and confirm entitlement to the *Journal of Bryology* and the *Bulletin* for the current year, as well as for the other services provided by the Society. If you have not already paid your subscription then an early remittance to the Membership Secretary (address below) will help to minimise postage costs.

I would like to thank all of those members who paid promptly last year. However, it was necessary to send first reminders to no less than 201 other members and second reminders to 40. Members will realise that this results in significant costs to the Society and are asked to pay promptly to minimise such avoidable costs.

Current rates are as follows:

Ordinary Members:	£20.00
Family Members:	£1.00
Concessionary Subscription:	£10.00

There are three categories of members who may opt to pay the concessionary subscription:

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Payment may be made:

1. By £ Sterling cheque payable on a London bank.

2. By Eurocheque (£ Sterling).
3. By Girobank International Transfer (**cost to Society of £2.50 must be added to cover transfer charges**). The Society's Account Number is 33 799 9805.
4. By credit card mandate (**ONLY** Barclaycard, Visa, Access, Mastercard, Eurocard accepted). **The cost to the Society of this method is 3% of the subscription which must be included in the mandate to make a total of £20.60 for ordinary members (£10.30 for concessionary subscriptions).**

An alternative method of payment is available for North American members. For details of this and for standing order mandate forms please contact the Membership Secretary.

Please note that both the collection and conversion of payments involves a cost to the Society and to the member, and this cost should be minimised as far as possible by prompt payment and choice of the most cost-effective system of payment available.

Cash is sent at sender's risk.

Mr M. Pool, 91 Warbro Road, Babbacombe, Torquay, Devon, TQ1 3PS, UK; e-mail: Mark.Pool@care4free.net.

PROCEEDINGS OF THE BRITISH BRYOLOGICAL SOCIETY

Throughout the following accounts of BBS meetings, new vice-county records are indicated by an asterisk (*). Nomenclature follows Blockeel & Long (1998), *A Check-list and Census Catalogue of British and Irish Bryophytes*.

SPRING FIELD MEETING, ABERGAVENNY, 1999

The last time that the Society visited this part of Wales was during the 1984 Spring Meeting held at Brecon. Abergavenny is further to the east, and whilst most of the excursions were in Breconshire (VC 42), we also ventured into Monmouthshire (VC 35). The town is convenient for visiting the Black Mountains lying to the north and reaching an altitude of 800 m. Like the Brecon Beacons to the west, they are composed of Devonian Old Red Sandstone and can be very base-rich in places. To the south-west lie the Coal Measures of the Welsh valleys, which are overlain by bands of Carboniferous Limestone. These have been heavily quarried in the past and the limestone contains an extensive cave system. The final day was spent on the acid conglomerates of the lower Wye Valley.

Our base was the Ty'r Morwydd Environmental Study Centre, a converted convent school, which lent an appropriate air of moral seriousness to the week's activities. The meeting was well attended, with 34 staying at the centre over the weekend, and about 44 present in the field, although as usual numbers dwindled towards the end of the week. Thanks to some unseasonable weather, members arriving on the Wednesday were greeted with the beautiful sight of sunlit snow

covering the Skirrid and the slopes of the Black Mountains, although the local secretary was rather anxious as an upland excursion had been planned for the next day. Shortly after her arrival, Jean Paton lost no time in finding *Syntrichia papillosa* (reported as new to VC 35 earlier in the year) on an ash trunk in the grounds of Abergavenny Castle.

THURSDAY 15 APRIL

Cwmyoy (SO2923, VC 35)

Although there was still a good deal of snow around, the area of Cwmyoy was clear. We squeezed into the small car park behind the church, and as the sun came out headed uphill to explore the west-facing sandstone cliffs and the extensive area of block scree. We had hoped to relocate *Grimmia longirostris* on some of the boulders, but despite prolonged search among the dried-up cushions of *Grimmia pulvinata*, *Orthotrichum cupulatum*, *Racomitrium heterostichum*, *Schistidium apocarpum* agg., *Ptychomitrium polyphyllum*, *Zygodon viridissimus* var. *stirtonii* and a perplexing form of fruiting *Grimmia trichophylla*, we were disappointed.

The boulders were quite base-rich and in places *Pterogonium gracile* and *Scapania aspera* were abundant. A few tufts of *Didymodon ferrugineus* were noted on the tops of some of the boulders shaded by trees, sometimes growing with *Porella arboris-vitae*. Other liverworts noted in this area included *Leiocolea turbinata*, *Lejeunea lamacerina*, *Reboulia hemisphaerica*, *Scapania compacta* and *Tritomaria quinquedentata*. On stony ground at the base of the cliffs there were several patches of *Brachythecium glareosum*, and higher up the slopes *Weissia brachycarpa* var. *obliqua* was recorded. The cliffs themselves were rather dry, but there were a few areas of water seepage where we found cushions of *Amphidium mougeotii*, *Didymodon rigidulus*, *Eucladium verticillatum* and *Gymnostomum aeruginosum*. There were some interesting epiphyte communities, especially on ash and elder in the sheltered areas at the base of the cliffs. Michael Proctor found a large patch of *Leucodon sciuroides*, and we also noted *Cryphaea heteromalla*, *Orthotrichum lyellii*, *O. stramineum*, *Syntrichia laevipila* and *Ulota phyllantha*. The latter plant has only recently been recorded as new from VC 35 and VC 36, so it seems to be increasing in the area. Although no great rarities were discovered, we saw 105 mosses and 28 liverworts at a most pleasing locality.

On the way back, we tried to relocate *Bryum gemmiparum* at a couple of its old localities on the River Grwyne near Forest Coal Pit, where it had been seen in the 1950s and 60s. Unfortunately there had been considerable disturbance to the river bank since that time, and we did not find the plant either there or further upstream at Coed-dias, although Seán O'Leary spotted an interesting plant on the bridge here that turned out to be *Grimmia decipiens*. I am pleased to report that later in the year Sam Bosanquet returned to Coed-dias and did find *B. gemmiparum* at this locality.

FRIDAY 16 APRIL

Clydach Gorge NNR (SO2212, VC 42)

Most of the day was spent exploring the lower part of the Clydach Gorge where the River Clydach cuts through the Carboniferous Limestone. We parked beside the disused Llanelly quarry, and walked down the steep wooded slope to the river. The limestone boulders beside the

track supported a rich growth of calcicolous bryophytes, including *Brachythecium glareosum*, *Scapania aspera* and some luxuriant *Taxiphyllum wissgrillii*. *Zygodon conoideus* was fruiting on elder, and a heap of cinders yielded a puzzling *Eurhynchium* that provoked much debate, but turned out to be *E. schleicheri* after all. At the bottom of the track Jean Paton confirmed the presence of *Plagiochila britannica*, and Mark Pool found a large patch of *Hypnum lindbergii*. At this point Mark Hill, together with Gordon Rothero, plunged down the steep slopes of the lower part of the gorge. He emerged further upstream with records of *Campylophyllum calcareum*, *Platydictya jungermannioides** and *Lophocolea fragrans**. *Nowellia curvifolia* was present on a number of logs, and Seán O'Leary found *Cephalozia lunulifolia**.

We had lunch beside the river close to some low cliffs where Martha Newton pointed out *Cololejeunea calcarea*. Some more intrepid members managed to cross the river and continued upstream. *Orthothecium intricatum* was present in some of the limestone crevices, and Gordon Rothero found patches of *Marchesinia mackaii**. Others returned to the old quarry, and noted *Aloina aloides**, *Jungermannia pumila*, *Leiocolea badensis*, *L. turbinata* and *Scapania compacta*.

Llangynidr Bridge (SO1520, VC 42)

In the afternoon we visited Llangynidr Bridge and the south bank of the River Usk for about a mile upstream, hoping to relocate the *Bryum gemmiparum* that had been noted by the BBS in 1984. Unfortunately we were disappointed in this, but we did find *Didymodon nicholsonii*, *D. spadiceus*, *Leskea polycarpa*, *Orthotrichum rivulare*, *Leiocolea alpestris* and *Plagiochila britannica*. Gordon Rothero noted *Fissidens exiguus*.

SATURDAY 17 APRIL

Craig Cerrig Gleisiad NNR (SN9621, VC 42)

Craig Cerrig Gleisiad is a north-facing sandstone cwm in the Brecon Beacons; it was last visited by the Society in 1984. Most people headed straight for the cliffs and worked their way along in scattered groups, exploring the rich bryophyte flora of the rock ledges. It was a good day for lovers of the Bartramiaceae, with *Bartramia halleriana*, *B. ithyphylla*, *B. pomiformis* and *Plagiopus oederianus* all being found in close proximity by Blanka Buryová. Other species from the rock crevices included *Amphidium mougeotii*, *Brachydontium trichodes*, *Seligeria recurvata* and *Rhabdoweisia crispata*. Some of the area was quite base-rich, with large mats of *Ctenidium molluscum* var. *condensatum* in the damper areas. There were cushions of *Anoetangium aestivum*, *Grimmia torquata* and *Gymnostomum aeruginosum* in the rock crevices, together with *Bryoerythrophyllum ferruginascens*, *Plagiobryum zieri*, *Orthothecium intricatum* and fruiting *Isopterygiopsis pulchella*. Jean Paton homed in on a gemmiferous stem of *Leiocolea heterocolpos* growing through a cushion of *Scapania aspera*, and Nick Hodgetts found *Scapania aequiloba** and *Frullania microphylla* var. *deciduifolia** in its second British locality. Tom Blockeel vanished up a gully, and was later able to confirm the presence of *Eremonotus myriocarpus*. Jan Hendey found *Racomitrium aquaticum* on some exposed rocks.

In the afternoon, various parties split off to visit other localities. Some scrambled up through the gullies and headed over the moorland to Craig y fro (SN9720). The flora here is similar to Craig Cerrig Gleisiad, but Mark Lawley added *Seligeria pusilla*, Ray Woods *Tetradontium*

brownianum, and Peter Martin *Tortella nitida* to the list. Seán O'Leary and others visited a ravine at Storey Arms (SN990200) and found *Jungermannia exsertifolia* ssp. *cordifolia* and *Plagiochila punctata*. A further party stopped at the ravine of the Gawnant Fawr (SO003131) and noted *Anastrophyllum hellerianum*, *Sphagnum quinquefarium* and *Lophozia sudetica*. Close by at the edge of the reservoir, Rod and Vanessa Stern recorded *Atrichum crispum*. Finally, Harold Whitehouse led a dedicated party to admire and photograph *Gymnostomum calcareum* growing on tufa at Vaynor (SO050103), at an old locality of Roy Perry's, just downhill from a pub.

The day concluded at Ty'r Morwydd with a meeting of Council, whose proceedings were rendered even more eventful than usual by the throwing of a stone through the window (from the outside!).

SUNDAY 18 APRIL

Grwyne Fawr (SO2330, VC 42)

Permission had been granted by Welsh Water for us to drive up to the Grwyne Fawr Reservoir deep within the Black Mountains. We spent some time investigating the outcrops of dripping base-rich sandstone below the dam. There were large cushions of fruiting *Gymnostomum aeruginosum*, and *Blindia acuta* was also plentiful. Graeme Smith found a fine patch of *Isopterygiopsis pulchella*, and *Scapania umbrosa** was present on some of the larger pieces of rock that had fallen to the ground. On the soil nearer the dam were found *Bryoerythrophyllum ferruginascens*, *Entosthodon obtusus*, *Campyliadelphus chrysophyllus* and *Barbilophozia attenuata*. *Orthotrichum cupulatum* var. *riparium** was abundant on the dam masonry.

We walked alongside the reservoir to reach the stream inflow and nearby low cliffs at the far end. Tim Blackstock noted *Scapania subalpina* and *Leiocolea bantriensis* beside the stream, and Mark Lawley recorded *Plagiochila spinulosa*. Angela Newton pointed out some good patches of negatively geotropic *Tetradontium brownianum* as we sheltered from a hailstorm. This grew in association with *Brachydontium trichodes* and *Seligeria recurvata*, and Gordon Rothero also found *Campylostelium saxicola*. Other plants seen included *Drepanocladus cossonii*, *Mnium marginatum*, *M. stellare*, *Tortula subulata* var. *graeffii*, *Barbilophozia floerkei*, *Leiocolea alpestris* and *Scapania scandica*.

Some stopped on the way back to explore a ravine at SO247291. All of us except Tom Blockeel walked past a large patch of *Riccia beyrichiana*. Picking our way through the macerating sheep corpses that littered the stream, we found a similar flora to that noted earlier in the day, although *Didymodon spadiceus*, *Orthothecium intricatum* and *Cephalozia lunulifolia* were additions. As it was Sunday, a number of the party visited the church at Partrishow, in order to admire the fine pre-reformation rood screen.

MONDAY 19 APRIL

Craig y Cilau NNR (SO1816, VC42)

A much smaller group met to explore the Carboniferous Limestone escarpment and old quarries of Craig y Cilau. The path led past the small raised bog of Wern Ddu (SO185165) which although

common land and degraded by heavy grazing was still of interest. Both *Calliergon giganteum* and *C. stramineum* were present, together with *Sphagnum flexuosum*, *Scapania irrigua* and some rather depauperate *Polytrichum strictum*. Seán O'Leary impressed us with his previously hidden credentials as a freshwater biologist, by finding a water scorpion.

Ron Porley headed straight up to the limestone cliffs, and recorded *Seligeria trifaria* and *Platydictya jungermannioides* before leaving early. The majority of the party continued up towards the old quarries along a more gentle path. *Scapania aspera* and *Scleropodium cespitans* were present on the boulders, and on the soil between the rocks Harold Whitehouse noticed a *Funaria* that turned out to be *F. muhlenbergii*. Not for the first time during the meeting, we found ourselves following in the footsteps of E.F. Warburg, who had visited Craig y Cilau in the course of his work on the apomictic *Sorbus* spp. He had recorded *Bryum mildeanum*, but the best candidate for the plant, found in short turf by Mark Pool, turned out to be only *B. pseudotriquetrum*. Also in the turf, Michael Proctor found *Mnium marginatum*, and Mark Lawley *Fossombronina* cf. *incurva*, but unfortunately there was not enough material to make a confident identification.

The limestone of the old quarries was rather hard and dry, but John Blackburn found *Seligeria pusilla*. On soil near the cave of Eglwys Faen we admired good material of *Reboulia hemisphaerica* with inflorescences. We also noted *Aloina aloides*, *Brachythecium glareosum*, *Dicranum bonjeanii*, *Plagiomnium elatum*, *Blepharostoma trichophyllum* and *Leiocolea alpestris*. Whilst heading back to the cars we were met by Graham Motley, from the Abergavenny office of the Countryside Council for Wales (CCW), who had found *Splachnum sphaericum* in a bog above the escarpment.

TUESDAY 20 APRIL

Prisk Wood (SO532090, VC 35)

The last day was extremely wet and put the dedication of the much-dwindled party of bryologists to the test. We visited two Gwent Wildlife Trust reserves in the lower Wye Valley, although it was impossible to do them justice given the weather conditions. The first, Prisk Wood, is an area of woodland that has grown up around a complex of small quarries in the acid conglomerate. A magnificent display of bluebells cheered us up almost as much as Mark Pool's discovery of *Lophocolea fragrans* that he plucked from a rock crevice beside a stream. *Plagiochila britannica* and *P. spinulosa* were noted, and *Orthotrichum pulchellum* and more *Ulota phyllantha* were found on elders. *Leucobryum juniperoideum* was present on the woodland floor.

Cleddon Shoots (SO523041, VC 35)

As we sat in our cars having lunch, the rain pounded against the windows, and we were joined by Peter Martin, who had left his warm dry office to join us for the afternoon. We proceeded to the wooded ravine at Llandogo known as Cleddon Shoots which had previously been visited by the Society in 1968. The stream was so full of water that it was difficult to explore it properly, but we were pleased to note that *Jubula hutchinsiae* and *Fissidens rivularis* were still present, and there were good mounds of *Hyocomium armoricum*. Beside the stream we recorded *Plagiothecium laetum*, *Metzgeria conjugata*, *Pellia neesiana* and *Plagiochila spinulosa*. Finally,

Peter took us a few miles south to Lower Wyndcliff (ST5297) where the opportunity to pay our respects to bryophytes of such stature as *Seligeria campylopoda* and *Gymnostomum viridulum* provided a fitting climax to the week.

Acknowledgements

I am very grateful to Ray Woods for the help he gave in organising the meeting, and for putting the resources of CCW at my disposal. Graham Motley kindly provided maps and lists of interesting species for some of the localities. Welsh Water gave permission for us to use their access road to the Grwyne Fawr Reservoir, and Gwent Wildlife Trust were happy for us to visit their reserves. Jean Paton kindly advised me on the organisation of the meeting, and scrutinised the draft of this report. My thanks are due to all those who sent in records and to those who verified material. Finally I would like to extend my personal thanks to all who attended the meeting, in the hope that they obtained as much interest and pleasure from it as I did.

JONATHAN SLEATH

SUMMER FIELD MEETING, WATERFORD AND WEXFORD, 1999

An account of this meeting will be published in the next issue of the *Bulletin*.

AGM AND SYMPOSIUM MEETING, MANCHESTER, 1999

Hulme Hall at the University of Manchester was the venue for the Annual General Meeting and symposium of 1999. Thanks are due to the local secretary, Sean Edwards, for his efforts in organising a smooth-running and very enjoyable event. Although I was unable to attend the Sunday excursion to Chee Dale and Deep Dale, I hear it went very well, with the three sites visited providing good lists and some species of note.

DAN WRENCH

MARK LAWLEY (LUDLOW, SHROPSHIRE): *THE BORDER BRYOLOGISTS AND THE BRITISH BRYOLOGICAL SOCIETY*

The Border Bryologists meet to look for and identify bryophytes in Shropshire, Herefordshire, and east Wales. We found it easy to start up our group because the Herefordshire Botanical Society was already providing a forum for active local botanists, to whom we could advertise. And since the Border Bryologists have come into existence, the Shropshire Flora Group has constituted itself into the Shropshire Botanical Society, which also advertises our activities to its members. So, with free advertising and postage provided by two local botanical societies, the Border Bryologists enjoy negligible running costs. Long may our two sugar-daddies remain solvent.

Why have a local group? What purpose does it serve? We wanted first to learn how to identify bryophytes in the field, which necessitated regular meetings close to hand, with an accomplished bryologist in attendance. During our first two years (1994 and 1995) Roy Perry attended nearly all our meetings, and provided the required expertise. Without Roy we would have struggled to identify the plants we found, and quite likely lost heart. Instead we gained sufficient momentum for lift-off. Latterly, Ray Woods and Jonathan Sleath have given expert help, despite busy professional careers. Gradually, the other members of our group have gained in confidence (if not in competence), even though it sometimes seems that the partly sighted are leading the blind.

And what of our future? Rather than allow our group to become a coterie of experienced bryologists, too daunting for beginners to join, those of us who have acquired a little bryological knowledge are trying in turn to help novices gain some bryological ability. Indeed, our most important function is to help interested but ignorant botanists gain a foothold on the lower rungs of cryptogamic competence. Collecting and compiling records for a site or grid-square, and finding uncommon species, are of secondary importance at our arranged meetings, and better catered for during *ad hoc* or solo sorties.

To further this educational gearing, the Border Bryologists have arranged an indoor workshop at Ludlow Museum this winter. Both the Museum and the bryologists stand to gain. The Museum benefits because getting more people in through the front door this year brings a bigger grant from local government next year. Consequently we have not been asked to pay to hire the museum's facilities. And budding bryologists will also benefit by acquiring confidence in examining and identifying bryophytes under the microscope: how to dissect leaves off stems, look for auricles on *Plagiothecium* stems, prepare peristomes for examination, search for stomata on *Orthotrichum* capsules, or for gemmae and gametangia.

So by getting beginners started - both in the field and indoors - an active Local Interest Group may serve a different function to that of the British Bryological Society. A local group is better placed than the BBS to cater for beginners, who are more likely to become aware of and attend local meetings than make the effort to travel long distances for national meetings. In this way a local group can act as a nursery for L-plate bryologists, who may subsequently join the BBS and the national scene. Indeed, several people from the Welsh borders have recently joined the BBS, apparently as a consequence of interest generated locally.

On the Welsh borders, as elsewhere, local natural history societies and wildlife trusts arrange meetings quite independently of each other, and indeed often seem entirely ignorant of each other's programmes. I certainly met with genuine rather than merely polite surprise and interest when mentioning the Border Bryologists to local wildlife trusts, and improved communication between groups of local naturalists may well bring more potential bryologists on to the scene. The Worcestershire Wildlife Trust has recently expressed interest in the Border Bryologists as a convenient local vehicle for introducing their members to bryology. At present, no one regularly records bryophytes in Worcestershire, and it will be interesting to see if anything develops in the county as a result of the Trust's initiative. I suspect that members of other local wildlife trusts would like to learn about bryophytes, but that neither the Trusts nor their members know who to approach locally, and understandably blanch at the prospect of going it alone.

By regarding local groups as nurseries for budding bryologists, one sees the role of our national

bryological society in a new light. The British Bryological Society is better placed than local groups to promote bryology to a wider public. My tip as top priority for the BBS's publicity arm in the coming century is publication of a popular, user-friendly field guide to genera of British and Irish mosses and liverworts: a guide with life-like drawings of the forms of bryophytes and any of their other characteristics which are visible through a lens, while leaving microscopic details for Floras which distinguish species. Its key might also have line-drawings instead of (or at least, as well as) polysyllabic tongue-twisters. The guide would also have distributional and habitat notes as in the three-volume *Atlas of the Bryophytes of Britain and Ireland*.

A well-produced field guide to genera of British bryophytes could not fail to become the BBS's flagship publication, and would do far more to attract the public to bryology than any coffee-table book or symposium volume of abstruse scientific articles. Bookshops abound with popular guides to vascular plants, birds, mammals and insects. It is time bryophytes joined them. The Border Bryologists will certainly find it much easier to introduce beginners to bryology once we have a good field guide to take out with us on our excursions.

Border Bryologists, 1999-2000

Copies of our programme are available from Mark Lawley (address below).

Publications

The Bygone Botanists of Herefordshire traces the social and personal histories of botanists who explored Herefordshire, with accounts of several accomplished bryologists, including Augustin Ley, Eleonora Armitage and Charles Herbert Binstead. £3.75 (inc. 50p p&p) from Heather Colls, The Steppes Cottage, Jingle Street, Wonastow, Monmouth, Gwent, NP5 4DL. Please make your cheque payable to 'Herefordshire Botanical Society'.

A Botanical Stroll through North Herefordshire describes the plants of interesting botanical sites in the countryside between Ludlow, Leominster and Presteigne, with annotated lists of bryophytes and vascular plants. £4 (inc. 50p p&p) from Heather Colls (address above); cheque payable to 'Herefordshire Botanical Society'.

All proceeds from sales of these booklets will help defray costs of publishing a projected Herefordshire Plant Atlas.

Contacts

Border Bryologists:	Mark Lawley, 12A Castlevue Terrace, Ludlow, SY8 2NG. Tel: 01584 876564.
British Bryological Society:	Mr M. Pool, 91 Warbro Road, Torquay, Devon, TQ1 3PS.
Herefordshire Botanical Society:	Mr Les Smith, Lonsdale, Firs Road, Ross-on-Wye, HR9 5BH. Tel: 01989 563599.
Shropshire Botanical Society:	Sarah Whild, 66 North Street, Castlefields, Shrewsbury, SY1 2JL.

TOM L. BLOCKEEL (SHEFFIELD): NOTES FROM A TOURIST IN MEDITERRANEAN LANDS

The author has visited many countries in the Mediterranean region over a period of nearly 30 years, primarily during family holidays. In spite of recent and exciting advances in the state of bryological exploration in some Mediterranean countries (notably in Spain), other regions remain poorly known. There are still many territories where exploration has been conducted largely by visiting bryologists, and the literature is therefore fragmented and difficult to obtain. There is no modern comprehensive Flora for a Mediterranean country.

Much of the Mediterranean region is characterised by hot dry summers and cool moist winters. However, it is a large and varied region, with extensive mountain ranges. Rich bryophyte communities can be found at all altitudes and there is much for the visiting bryologist to see; even casual and opportunistic collecting can result in significant advances in our knowledge of these countries.

The author's interest first began as a student of classical Latin and Greek, and many of his visits have taken in the classical antiquities. There is much of interest to be seen in and near such places. Equally, however, it is not difficult to gain access to the Mediterranean countryside to explore natural and semi-natural plant communities. A little research prior to a visit, both in the botanical and tourist literature, will often suggest areas of potential interest.

Examples of archaeological and other tourist sites where the author has found interesting bryophytes include:

- Pont du Gard, France. The River Gardon upstream from the famous Roman aqueduct passes through the Gorges du Gardon. Although at the northern limit of the Mediterranean region phytogeographically, the south-facing slopes of the Gorges provide a fine opportunity to see some characteristic thallose liverworts, e.g. *Corsinia coriandrina* (Spreng.) J. Lindb., *Oxymitra incrassata* (Brotero) Sérgio & Sim-Sim, *Mannia androgyna* (L.) A. Evans, and several *Riccia* spp., including *R. michelii* Raddi and *R. ciliata* Hoffm. s.l.
- Pozzuoli, Italy. The Bay of Naples is a fascinating region, full of cultural, historical and geological interest. Visitors go to see Vesuvius and the Roman town of Pompeii. But there are less frequented places to be seen. On the northern side of the Bay are some classic sites of Roman mythology. The town of Pozzuoli has a fine amphitheatre with a beautifully preserved substructure, and nearby a curious volcanic crater known as La Solfatara. Here is one of the few places on the European mainland where it is possible to see the moss *Trematodon longicollis* Michaux, which in Europe is very much associated with the volcanic parts of southern Italy (there is a single site in Crete).
- Segesta, Sicily. The large island of Sicily has several well-preserved Greek temples. During a visit in spring 1999, the author found an exceptionally fine population of *Funariella curviseta* (Schwaegr.) Sérgio at the beautifully situated temple of Segesta in the west of the island.
- Tiryns, Greece. The Mycenaean civilisation which flourished in the second millennium BC left a notable architectural legacy, of which the best known and most visited example is the citadel of Mycenae. There is another citadel, Tiryns, not far away on the outskirts of

the town of Argos, which like Mycenae was protected by remarkable so-called Cyclopean walls, built from massive blocks of red and grey limestone in the 13th century BC. During a visit in 1995 the author noticed a small thallose liverwort growing on compacted earth in a crevice on one of these walls. This proved to be *Athalamia spathysii* (J. Lindb.) S. Hatt. Müller (1951-58) in his classic European Flora gives a locality at Mycenae, a few kilometres distant. *A. spathysii* is not normally reported from man-made habitats, even those that are over 3000 years old!

- Festos (Phaestos), Crete. The Minoan civilisation in Crete is also one of great antiquity. A number of Minoan palaces from the second millennium BC have been excavated. It was at one of these, the palace of Festos, where the author made his first significant collection of Mediterranean mosses. These included a distinctive bud-like plant, with broadly revolute leaf margins. It was *Tortula fiorii* (Venturi) G. Roth, now generally treated as *T. revolvens* (Schimp.) G. Roth var. *obtusata* Reimers, which at the time was a new record for Crete.
- Episkopi, Cyprus. The remains of the Greek and subsequently Roman town of Kourion (Curium) are situated near the sea cliffs of the south-facing coast of Cyprus near Episkopi. The soft limestone of these cliffs supports a particularly interesting xerophytic flora, which includes *Grimmia pitardii* Corb., *Aschisma carniolicum* (F. Weber & D. Mohr) Lindb. and *Gigaspermum mouretii* Corb.

Sooner or later the bryologist in Mediterranean lands is likely to encounter distributional and taxonomic problems. While recent advances have solved some of these problems, others need further research.

- *Gigaspermum mouretii* is an example of a species with a fragmented distribution showing a strong disjunction between the eastern and western Mediterranean. It was described in 1912 from Morocco, but it was not until some 15 years ago that its known distribution was extended to southern Spain and subsequently Mallorca and the Canary Islands. *G. mouretii* has also been found in Israel, and the new locality in Cyprus reinforces the east-west disjunction.
- The genus *Anacolia* is an example which shows how our knowledge of distribution patterns may be complicated by taxonomic issues. Until recently the Mediterranean collections of this genus were presumed to belong to *A. webbii* (Mont.) Schimp., although 30 years ago Townsend (1965) noted that the Cypriot plants had much in common with *A. menziesii* (Turner) Paris. As a result of recent discoveries in Spain (García-Zamora *et al.*, 1998) it is now known that both of these species occur in the Mediterranean. *A. menziesii* emerges as another east-west disjunct, although its distribution remains to be clarified in detail. It seems that *A. webbii* is a western Mediterranean species which extends eastwards to a single site in Sicily.
- *Grimmia nutans* Bruch also has a rare and fragmented distribution. It was described from western Turkey and remained neglected for many years until it was found in Greece, when it was first thought to be an undescribed species, *G. meteora* C.C. Townsend (Townsend, 1989). There have been only two further records, from Tenerife and Cyprus. It remains unclear whether its distribution is really so fragmented as it currently appears. It seems likely that it may yet be found in Italy and/or Spain.
- *Athalamia hyalina* (Sommerf.) S. Hatt. is not an obvious choice of a Mediterranean bryophyte. It is in many ways a characteristic Arctic-Alpine species, widespread in

Scandinavia and the Alps. But it also turns up as a rarity in sub-montane Mediterranean localities. It has been known on Crete for many years and it occurs in the south of mainland Greece, where the author collected it in two places in 1995, one of them at an altitude only slightly in excess of 1000 m, in a fairly benign Mediterranean environment. The common factor between these southern and northern stations appears to be a seasonally arid climate, to which *A. hyalina* is presumably well adapted.

- Anyone collecting species of *Syntrichia* (*Tortula*) in the mountains of the Mediterranean (Cyprus, for example) is likely to encounter specimens with a remarkable form of leaf ornamentation. On both surfaces of the cells the papillae are raised on mammillose extensions of the cell lumen - such that they are sometimes described as columnar. The significance of this character was discussed by Bizot (1954, 1956). The problem, taxonomically, is that the character occurs in a series of parallel forms with relationships to a number of different species in the genus. There is a *ruralis* form (*S. papillosissima* (Copp.) Loeske), a *princeps* form (*Tortula echinata* Schiffn.), and a *virescens* form (*Tortula bizotii* Lazarenko). Interestingly, there is also a corresponding form of *Tortula muralis* Hedw., *T. israelis* Bizot & Bilewsky. There is clear link with ecology and climate: most of these taxa occur in arid montane regions. But should they be regarded as species in their own right? Traditional techniques alone may not be adequate to solve the problem. Current treatments tend to rank them as subspecies or varieties. However, *T. israelis* is a particularly interesting case, as it occurs at low altitudes and its ecology overlaps with that of the widespread *T. muralis*.
- When it was found in Sussex new to Britain some years ago (Crundwell & Nyholm, 1972), *Tortula freibergii* Dixon & Loeske had all the appearance of being a very distinct species of its genus. Further finds have shown it to be very variable in its essential characters: the leaf cells may be smooth or papillose; the nerve may cease below the apex or may be percurrent or slightly excurrent; the marginal leaf cells are usually elongate, especially in the inner few rows, but sometimes indistinctly so. Its distribution is also difficult to explain. It occurs in widely separated localities in western Europe, but appears inexplicably rare. Collections made by the author during a recent visit to Sicily provide some evidence that *T. freibergii* may be an extreme form of *T. solmsii* (Schimp.) Limpr. occurring in relatively humid locations. Its identity therefore merits further investigation.
- *Orthotrichum acuminatum* H. Philib. shows how distinct taxa can remain poorly understood for lack of adequate collecting. It was described by Philibert (1881) from material collected in France and Italy, but in spite of its distinctive peristome remained poorly known for many years. In 1990 it was reported from new localities in Spain, and Spanish bryologists soon established that it was widespread in the Iberian peninsula. Recently it has also been reported from the Canary Islands. In 1995 the author found a small amount of it among material collected in southern Greece, and in 1998 found it several times in the Troodos mountains in Cyprus. This year he collected it again in Sicily. *O. acuminatum* is now seen to be a widespread and probably rather common Mediterranean species. It is remarkable, in view of its distinctiveness, that it could have been neglected for so long. There are surely other similarly neglected taxa in the Mediterranean literature awaiting rehabilitation.
- One such taxon is *Cynodontium meridionale* Herzog, which the author has had reason to investigate. Material of *Cynodontium* was collected in 1995 on the Methana peninsula in south-east Greece, at a site known locally as the Crater of Hephaestus. It is a lava field with massive blocks of tufa which retains a more-or-less natural vegetation in the deep

hollows and crevices. Several of the bryophytes which occur there are unusual in the fairly severe Mediterranean climate in this part of Greece. Investigation of the *Cynodontium* led to the name *C. meridionale*, a species described by Herzog (1910) from Sardinia, and to collections made by the author during the BBS meeting in Portugal in 1989. Provisional conclusions are that *C. meridionale* is a distinct species occurring in Portugal and Sardinia. The Greek plant is similar and may belong to the same species, but it differs in a number of minor characters.

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DR ANGELA E. NEWTON (NATURAL HISTORY MUSEUM, LONDON): *BRYOPHYTES IN AMBER FROM THE DOMINICAN REPUBLIC*

The Paleobotany Department at the National Museum of Natural History (Smithsonian Institute) in Washington DC has a large collection of amber from the Dominican Republic. Many of these pieces of amber contain bryophytes, some with two or more species and several individuals. In 1995 I worked with collections from La Toca and Palo Alto mines, preparing them for microscopic examination and, as far as possible, identifying the taxa represented.

Amber is formed when the resin from certain trees undergoes fossilisation. The resin in this case comes from *Hymenea protera* Poinar (Leguminosae), which has close relatives still extant in the Caribbean. During the first stage of fossilisation the resin becomes polymerised and brittle, but remains soluble in alcohol. In this state the resin is known as copal, and is frequently dug up in large quantities to be used in varnishes or as incense. After several million years of exposure to heat, high pressure, and also seawater, the copal becomes transformed into amber. The age of the Dominican amber is uncertain, and may be anything from 20 to 40 million years old. Some of the amber deposits are overlain by Miocene reefs, so must pre-date these, giving a minimum age of 20-25 million years. Examination of associated fossils in the substrate gives an age of 30-45

million years for the La Toca mine, and 23-30 million years for the Palo Alto mine. However, the pieces may be older than this, as they show evidence of reworking, and so must have been redeposited some time after fossilisation. Nuclear magnetic resonance dating of the amber gives similar ages (30-40 million years for La Toca, 20-30 million years for Palo Alto), but these dates are relative to dates based on the fossil stratigraphy (Poinar, 1992).

Bryophyte specimens preserved in amber consist of little more than impressions and there is very little tissue present. Since amber is not soluble, and is too brittle to cut, preparation of amber for study usually involves grinding and polishing to provide thin sections and smooth surfaces. The resin when fresh is a viscous liquid, which will drip and flow across the substrate, usually either bark or soil. As a consequence the amber is full of flow lines, curved surfaces, bubbles, and various kinds of debris. All these artefacts cause tension and stresses in the amber, and exposure to shocks and vibration can cause sudden fracturing and fragmentation. The flow lines and curved surfaces also cause light diffraction that can prevent clear resolution of details.

The bryophytes themselves differ in the visibility and clarity of features. For example, in Lejeuneaceae many details of taxonomic importance may be visible. The plants grow in a single plane, and if exposed on both ventral and dorsal surfaces it may be possible to see features such as underleaves, lobules, rhizoids, stem epidermal cells, leaf shape and margins, cell shape, trigones and papillae, ocelli distribution, gemmae, and branching patterns. However, if the plants are attached to bark all the ventral details are obscured, and if the plants are curved or twisted it can be impossible to see anything clearly. Most moss specimens are much more difficult to work with, due to the tufted and three-dimensional growth form, imbricate leaf bases and curving leaves. Important details for identification, such as presence, distribution and shape of alar cells, are usually obscured by the overlapping leaves. Even the presence or absence of a costa can be impossible to verify unless it is very robust and extends beyond mid-leaf. Many mosses in amber appear to be desiccated, and therefore the leaves are usually in-rolled or collapsed, further obscuring details of the leaf margin and cell shapes. However, despite the impossibility of extracting and dissecting the bryophytes, it can be possible to find or make stem and leaf sections. In brittle-leaved species of *Octoblepharum* and *Leucobryum* there may be exposed sections within the amber. It is also possible, with care, to grind the amber in such a way as to cut through the bryophyte material and provide sections. These can then be stabilised by the use of certain resin-based glues.

Several of the taxa occur in other collections of Dominican amber (Frahm, 1993). For example, one of the most abundant mosses is a branching and weakly complanate member of the Neckeraceae, possibly *Neckera* (Frahm, 1993). In the Smithsonian material examined there appeared to be a weak, mid-length costa in some leaves, but this was extremely difficult to confirm due to leaf curvature and refraction in the amber. However, the presence of a costa would indicate that the plant belongs to *Porotrichum*, a common neotropical genus with several species extant in the Dominican Republic. Several species of *Leucobryum* have been found. In several of the specimens the cell layers can be seen in leaf sections resulting from natural breakage and from cross sections resulting from grinding. These show a pattern of cell distribution consistent with that seen in *Leucobryum crispum*. The leaf shape and posture also match this species.

Many of the species are very close to extant species, despite being 20 to 45 million years old. However, these are really very recent fossils, compared with the evolutionary history of the bryophyte lineages, which may cover 400 million years or more (Kenrick & Crane, 1997). These

fossil assemblages, which include a wide range of taxa from many different plants and animals, provide insight into the past ecology of the Caribbean.

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NICK HODGETTS (JOINT NATURE CONSERVATION COMMITTEE, PETERBOROUGH) & DR CHRIS PRESTON (INSTITUTE OF TERRESTRIAL ECOLOGY, MONKS WOOD): DEVELOPMENTS IN BIOLOGICAL RECORDING

Chris Preston briefly reviewed the recent recording activities of the BBS, which culminated in the *Atlas of the Bryophytes of Britain and Ireland* and a database of 770,000 records held at the Biological Records Centre (BRC). This database is currently being updated with records submitted since the completion of the *Atlas*. It has been used in a number of research projects, including the Society's own epiphyte survey, studies of hot-spots and complementary areas in different taxonomic groups, the identification of biogeographical zones based on environmental factors and species' distributions, and the classification of bryophyte species into floristic elements.

Since the completion of the *Atlas* there have been major changes in biological recording. The current BSBI 'Atlas 2000' project illustrates how the ability of recorders to send data on disk has transformed the number of records which can be processed. The National Biodiversity Network (NBN) is a partnership which provides a framework for future recording activities. One aim of the NBN is to provide internet access to distributional data, including that held by BRC. It is hoped that, with the agreement of the BBS, the bryophyte data can be used as a pilot dataset in the development of this access.

In the years since the completion of the *Atlas* there has, inevitably, been a period of recuperation for bryophyte recorders. It may now be appropriate to review the Society's recording activities, with a view to developing projects which would help existing members develop their field and identification skills and recruit new members. A number of possibilities were suggested.

Nick Hodgetts then explained how recording by BBS members could contribute to the conservation of threatened species through a scheme similar to the Threatened Plant Database Project (TPDP) that is currently under way as a co-operative venture between the statutory conservation agencies, the BSBI and Plantlife. Records of threatened species need to contain a higher level of information than records of species which are not threatened and, if a dataset of records of threatened species is to be useful for conservation purposes, it needs to be a 'live' database, not just an archive. The idea behind the TPDP is to co-ordinate BSBI membership to provide data on threatened species and, in return, to provide the membership with data as required. It was envisaged that it would be relatively straightforward to set up something similar with the BBS, given the existing network of vice-county recorders.

An important principle behind such a project is to devolve responsibility for data inputting and validation to those who actually know the plants – the BBS membership, in the case of bryophytes. This fits in well with the NBN, which is envisaged as a network of communicating databases rather than an unwieldy monolith. It was then explained how the information from such a database could be used effectively for conservation through Biodiversity Action Plans.

A further JNCC project just starting is the Species Status Project. This seeks to establish a more rational basis for assigning threat status (i.e. the IUCN threat categories of *Endangered*, *Vulnerable*, etc.) to species. As with the database project, the rationale is to devolve responsibility as much as possible to the experts, with an expert group for bryophytes (for example) being established to produce a draft list of species statuses, this being disseminated for consultation, and a ‘final’ list being published on a website. The list will be updated over an agreed timescale. The expert group will also have a role in ensuring that the latest bryophyte checklist is the standard used in NBN software such as Recorder 2000.

To summarise, bryological recording is in a transitional period, with increasing numbers of recorders becoming *au fait* with computers, and technology just beginning to do the things we want it to do. The future of bryophyte recording is still entirely in the hands of the BBS, but potential partnerships with other organisations, and initiatives such as the TPDP and the NBN, can potentially make our recording more useful and our records more usable. Atlases will always be useful, and increasingly easy to produce, but will be only one possible product; others include using bryophyte data in wider environmental studies and in analysing hotspots, biogeographical zones, etc. The BBS now has an opportunity to increase its influence and use its expertise more effectively by full involvement in these initiatives.

J.G. DUCKETT, A.M. SCHMID (QUEEN MARY AND WESTFIELD COLLEGE, LONDON), R. LIGRONE (UNIVERSITY OF CASERTA, ITALY) & K.S. RENZAGLIA (UNIVERSITY OF SOUTHERN ILLINOIS, USA): CONDUCTING TISSUES IN BRYOPHYTES: CORNERSTONES IN LAND PLANT PHYLOGENY

Some 35 years ago, when one of us (JGD) was young, enthusiastic and impressionable, he asked a wise bryologist for his views on evolutionary relationships between bryophytes and tracheophytes. The answer: bryophytes don’t work in the same way as vascular plants, and the deeper you investigate the greater are the differences. This is very much the current situation concerning conducting tissues; the more one studies their structure, development and function, the more differences one finds. Critical to reconstructing land plant phylogeny is the establishment of homologies, or lack of these, between the conducting elements of the various lineages.

The substantial literature on the structure of bryophyte conducting elements is reviewed in Hebant (1977). However, as with many things bryological, from purely structural data speculative functional and phyletic inferences have tended to become engrained in the literature without any developmental or experimental functional foundation. Establishment of homology requires structural, developmental and functional congruence (Ligrone, Renzaglia & Duckett, 2000).

Internal conducting tissues in bryophytes are restricted to the gametophyte generation in liverworts, are unknown in hornworts, but may occur in both generations in mosses. The key character of water-conducting cells (WCCs) is that they lack cytoplasmic contents and are dead

at maturity (Raven, 1993). In liverworts these occur in the Calobryales and Pallaviciniaceae. The peg rhizoid-containing grooves on the stalks of the carpocephala of Marchantiales are an 'internalised' external water-conducting system. The WCCs in Calobryales are similar in shape to ordinary parenchyma cells and are perforated by plasmodesmata-derived pits, features shared with *Takakia* in the mosses. Those in the metzgerialean genera *Hymenophyton*, *Pallavicinia* and *Symphyogyna* are highly elongate with thickened pitted walls. These perforate WCCs most likely evolved independently in Calobryales, Metzgeriales and *Takakia*. In contrast, moss WCCs (hydroids) are very highly elongate cells with imperforate walls. Their differentiation includes obliteration of plasmodesmata and modification of the original transverse walls. Because of their loosely fibrillar appearance, in transmission electron micrographs, it has been generally assumed that the maturation of these walls involves enzymatic removal of non-cellulosic carbohydrates, though direct evidence for such 'hydrolysis' has never been produced. Our current studies have revealed that these walls contain a proteinaceous moiety that renders hydroids highly resistant to cavitation. Hydroids should now be regarded as a specialized WCC unique to mosses and related to poikilohydry. Homology with tracheids is highly implausible.

The food-conducting leptoids of polytrichaceous mosses, and the less specialised conducting parenchyma cells in the leafy stems and setae of other mosses, including *Sphagnum* and *Takakia*, have a highly distinctive cytology comprising cytoplasmic polarisation, axial arrays of endoplasmic microtubules associated with various organelles (including mitochondria and pleomorphic vacuoles) and numerous, highly differentiated plasmodesmata in their end walls (Ligrone & Duckett, 1994, 1998). Similar organisation, indicative of long-distance transport of nutrients, also occurs in moss rhizoids and caulonemata, in the internal parenchyma of metzgerialean and marchantialian thalli, and in the leafy shoots and underground axes of Calobryales (Ligrone *et al.*, 2000). Although studies with radioactive tracers indicate that long-distance solute transport in bryophyte conducting cells is via mass-flow, the suite of cytological differences between these and sieve elements in tracheophytes almost certainly rules out homology.

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DR ELIZABETH SMITH (UNIVERSITY OF NORTHUMBRIA AT NEWCASTLE): THE ROLE OF THE PHOTOSYNTHETIC CARBON CONCENTRATING MECHANISMS IN BRYOPHYTES

Four hundred and fifty million years ago many of the earliest plants possessed a 'carbon concentrating mechanism' (CCM) which increased the efficiency of photosynthesis, particularly in the aquatic environment. However, during the development of terrestrial vegetation the CCM was lost, although biochemical mechanisms which perform a similar function to the CCM (C₄

photosynthesis and Crassulacean Acid Metabolism) evolved approximately 50 million years ago.

The Anthocerotae are of interest because they represent terrestrial organisms in which the carbon concentrating mechanism has persisted, at least within some genera. The activity of the carbon concentrating mechanism is correlated with the presence of a pyrenoid in the chloroplast, a region where the CO₂-fixing enzyme Rubisco is located. Studies of members of the genus *Anthoceros*, which possesses a pyrenoid and a carbon concentrating mechanism, and the genus *Megaceros*, which does not possess a pyrenoid, are providing valuable data enabling us to elucidate the mode of action of the CCM.

Future research at the University of Northumbria will focus on gathering physiological data from this interesting group. We hope to elucidate the mechanism of the CCM in the Anthocerotae, and to carry out comparative studies of this strategy and the CCMs operating in a number of other non-vascular plants. The results of these investigations will enable us to address the question: why did land plants give up the advantage of a CCM only to develop a biochemical equivalent some 2-3000 million years later?

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DR JONATHAN SLEATH (KINGSTONE, HEREFORDSHIRE): SOME OBSERVATIONS ON THE BRYOPHYTES OF THE MARSYANDI VALLEY, CENTRAL NEPAL

In July 1998 I had the opportunity to join a group from the Alpine Garden Society on a trek up the Marsyandi valley, in Central Nepal. The trek started from Dumre (450 m), about 75 miles to the west of Kathmandu, and followed the Marsyandi river northwards, behind the Annapurna massif to Thorong Phedi. From here we climbed to the Thorong La pass (5400 m) and retraced our steps back to Dumre. This was not a formal scientific expedition, but I was able to make some bryological observations, take photographs, and perform a little opportunistic collecting.

The track from Dumre to Besi-sahar (820 m) is not passable by vehicles during the monsoon season, which was when we were travelling. This subtropical area has very little natural vegetation, and is intensively cultivated for rice. The bryophyte flora was rather poor, with xerophytic thallose liverworts, such as *Plagiochasma appendiculatum*, on roadside banks, and *Marchantia* sp. forming extensive patches along the edges of the paddy fields. The epiphytic *Octoblepharum albidum* was present on some of the larger trees. Above Besi-sahar the valley begins to become narrower, and the cultivation more patchy. There are more areas of waste ground and disturbed woodland, although the epiphyte growth is poor (presumably due to the very seasonal rainfall) and the richest bryophyte communities are associated with wet rock faces. Mosses found here included *Aulacopilum abbreviatum*, *Gollania schensiana*, *Racopilum*

orthocarpum and *Scopelophila ligulata*.

The path rises steeply before entering the village of Tal (1700 m), which is built on the shore of a lake formed by the Marsyandi when its outflow was blocked by a landslide. The thallose liverwort *Exormothea tubifera* is abundant here on the sandy lakeside margins, together with *Rhodobryum ontariense*. The valley above Tal becomes narrower and more humid, but although there were plenty of waterfalls at this time of year, they had little bryophyte growth. On the moist rock faces there were large patches of *Meteorium buchananii*, together with *Porella* sp. and *Asterella wallichiana*. *Fissidens grandifrons* was found growing on an ox bone partly submerged in a flush. From Dharapani (1900 m) to Bagarchap (2100 m) there is more cultivation again, and above this point the path enters temperate woodland.

This is the richest area bryologically of the whole valley. The woodland is mainly broadleaved, with some *Pinus wallichiana* at higher altitudes. The epiphyte growth is relatively rich and includes *Anomodon minor* ssp. *integerrimus*, *Leucodon secundus* and *Macromitrium hymenostomum*. On the woodland floor were the mosses *Plagiomnium cuspidatum*, *Rhytidium rugosum* and *Myurella sibirica*, together with liverworts such as *Jungermannia* sp., *Plagiochila* sp., *Chiloscyphus fragilis* and the abundantly gemmiferous *Lophocolea minor* on rotting wood. This area is very unstable, and we had to pick our way carefully across several landslides, where *Timmiella anomala* was common. In some of the more open areas, *Grimmia longirostris* was present on the rocks, and thallose liverworts such as *Asterella mussurensis* and *Mannia* sp. grew beside the track. Beyond Bhratang (2800 m) the path veers up and away from the river, through some *Pinus* woodland, and into the lower Manang valley.

This upper part of the Marsyandi valley is much drier, being subject to a rain shadow effect from the Annapurna range. The landscape is more open, rather sub-alpine in appearance, and quite heavily grazed. Both the environment and the people show strong affinities with Tibet. Beyond Pisang (3200 m) there are patches of *Betula utilis* woodland with a good growth of *Thuidium* sp. and other pleurocarps. Although dry, some meadows receive moisture from flushes fed by seepage of glacial meltwater. *Barbula pseudo-ehrenbergii* is found here, along with familiar plants such as *Palustriella commutata*, *Cratoneuron filicinum*, *Bryum* sp. and *Philonotis* sp.

Above Manang (3500 m) the ground is very dry, most of the precipitation falling as snow in winter. The scrub is dominated by *Rosa sericea* and *Juniperus*. What few bryophytes there were seemed to be mainly restricted to deep rock crevices or the occasional flush. Once past Letdar (4000 m) there is more moisture under the dwarf shrubby *Juniperus*, *Rhododendron* and *Berberis* which permits the growth of *Didymodon asperifolius*, *Syntrichia norvegica* and *Plagiopus oederianus*. Many of the large boulders have circinate patches of *Macrocoma* sp. At higher altitudes, the ground becomes more barren, and the increasing number of unstable screes and landslides permits only limited bryophyte growth.

At Thorong Phedi (4500 m), the track leaves the Marsyandi, and ascends steeply to the pass at Thorong La. This is a silent and desolate arid wilderness of shattered rock and glaciers. Where the scree becomes stabilised there is a fascinating higher plant flora although the number of bryophytes is relatively few and includes *Hypnum plumaeforme* and *Mnium thomsonii*.

I have been very much indebted to David Long and Cliff Townsend for their assistance in the

determination of the majority of the material collected. I have also had helpful advice from Howard Matcham, Brian O'Shea, Henk Greven, Dries Touw and Philip Sollman.

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FIELD EXCURSION TO CHEE DALE AND DEEP DALE, 12 SEPTEMBER 1999

A field excursion was held on the Sunday of the AGM weekend to the limestone dales near Buxton in Derbyshire. The principal venue was Chee Dale, a reserve of the Derbyshire Wildlife Trust which has recently been extended by the purchase of ground immediately to the west of the old Millers Dale railway station. The car park at the disused station was our starting point for the day. We were pleased to be welcomed by Steve Price, the reserve manager, who acted as our guide.

The morning was spent in old quarries on the south-facing slopes near the station. The ground was dry and stony, and this limited the diversity of the flora. *Didymodon ferrugineus* and *Aloina aloides* were among the species seen. Many epiphytic bryophytes remain scarce in Derbyshire, so a record of *Radula complanata* on a tree at the edge of the quarry was very pleasing.

After lunch, members proceeded to Chee Dale proper, a wooded limestone gorge with precipitous crags. It was sad to see the erosion caused by the increasing numbers of rock-climbers who visit the gorge. The relatively dry conditions on the rock walls after recent dry weather permitted some species to be detected more easily than usual. Among those noted on the limestone cliffs and boulders were *Preissia quadrata*, *Apometzgeria pubescens*, *Leiocolea alpestris*, *Pedinophyllum interruptum*, *Porella cordaeana* and *Cololejeunea calcarea*. The mosses included *Gymnostomum calcareum*, *Seligeria acutifolia* and *Orthothecium intricatum*. *Fissidens crassipes* was in the River Wye. Careful searching on one crag eventually revealed very small amounts of *Seligeria trifaria* at this recently discovered site. It is unfortunate that this crag lies outside the reserve and is suffering particularly badly from the activities of rock-climbers.

A feature of the epiphytic flora of this part of the Wye valley is the abundance of *Sanionia uncinata* on some of the trees, fruiting profusely. *Pylaisia polyantha*, which was seen on several trees, also attracted much interest.

Deep Dale, a narrow valley running south-west from Topley Pike Quarry, had been put forward as an alternative venue for the day. A small group led by Tony (AV) Smith made this their main objective, recording *Distichium inclinatum* and *Leiocolea badensis* in the lower part of the dale near the Quarry. Another group made a quick incursion late in the afternoon in search of *Brachythecium appleyardiae*, found here a few years ago. The population was refound without difficulty on dry stones at the base of a crag. Also seen during this brief visit were *Breutelia chrysocoma*, in small quantity at a known site, and *Scapania aspera*.

Our thanks are due to the Derbyshire Wildlife Trust for permission to visit Chee Dale, and especially to Steve Price for his commendable patience at our characteristically slow progress through the reserve.

TOM BLOCKEEL

REPORTS OF LOCAL MEETINGS

THE BORDER BRYOLOGISTS, 1999

The story of *Fitzcarraldo*, a film about the tribulations suffered by a wealthy aesthete as he journeys through jungle to build an opera-house, that his pet pig might recline in comfort while listening to the finest arias, might be an Amazonian allegory for the obstacles and inconveniences endured by naturalists as they seek pleasure in the company of new or notable species. And as with fine music, pleasure is their only reward. This lack of utilitarian benefit to offset the costs of their enquiries may be why normal folk regard naturalists as a few tiles short of a full roof. But like Edith Sitwell would have said, if we are a bit cracked, that must be where the light shines in.

The sanity of the Border Bryologists was definitely open to question on their first outing of the year in January at Dinmore Hill, south of Leominster. Proceedings got underway in a hailstorm, but fortune favoured the foolhardy and our pluvial predicament soon abated. The wooded crown of Dinmore Hill is botanically boring, having been clear-felled during the First World War, and is now cloaked in standard coppice on acidic soil, but better-drained soil along the hill's southern slope in the Burghope valley showed botanical evidence of lime or minerals or both, with *Campylophyllum calcareum* in an old quarry, and *Campyliadelphus chrysophyllus* nearby with *Rhynchostegium murale* and *Homalothecium lutescens*. *Leiocolea turbinata* grew on the side of a ditch, and further up the valley a small stream gave us *Palustriella commutata* var. *falcata*, *Eucladium verticillatum* and *Amblystegium tenax*. Climbing back towards the top of the hill, Ralph Martin found *Taxiphyllum wissgrillii* in the wood, and *Bryum sauteri*, with its pyriform rhizoidal gemmae, grew in bare soil beside a muddy track.

The weather was no better for our meeting in February, as an arctic north wind drove blustery showers across wet heath and sheepwalks at Cleeton St Mary on the eastern side of Titterstone Clee Hill. Pragmatism prevailed and prudence propelled us into a little wooded ravine, where several species unusual this far east in our region waited to welcome us: *Hyocomium armoricum*, *Heterocladium heteropterum* var. *heteropterum* and *Hygrohypnum luridum* in or beside the stream, along with *Brachythecium populeum*, *Mnium stellare*, *Racomitrium affine*, *Zygodon viridissimus* var. *stirtonii* and *Trichocolea tomentella*. With the wind and rain easing after lunch we ventured away from the stream across open sheepwalk on the hill's north-eastern flank, finding *Pohlia elongata* var. *elongata* and *Nardia geoscyphus* on a grassy dike, *Dicranum bonjeanii* and *Jungermannia hyalina* in wetter conditions, and *Cephaloziella divaricata*, before the numbing cold persuaded us home for hot-crossed buns.

Another bitterly cold day in March found us grubbing about on the exposed top of Merbach Hill in west Herefordshire. *Bryum subelegans*, *Orthotrichum lyellii* and *Zygodon conoideus* grew in the hedge by the lane, but in deference to the wind, the old quarries and heath on the summit of the hill won briefer attention than they warranted. Nevertheless, *Dicranum bonjeanii* and *Racomitrium aquaticum* went on the list. We retreated after lunch to the shelter of Wern Wood, a Herefordshire Nature Trust reserve near Bredwardine, where Jonathan Sleath found *Ulota phyllantha* new to Herefordshire, and also pointed out *Hennediella stanfordensis* on a soil-bank by the path. Perhaps this moss had come up from the River Wye, about half a mile away. *Ditrichum cylindricum* grew on bare soil exposed by coppicing, and rocks in a little stream gave us *Rhynchostegiella teneriffae*, *Gyroweisia tenuis* and *Fissidens crassipes*. The latter three species

are probably under-recorded in the West Midlands, perhaps because not all bryologists paddle about in streams.

As English cryptogams curled up in the summer's dryness, our annual lusting for Scotland began, and four pilgrims headed north in July for a week scampering over Breadalbane and neighbouring hills with Brian Brookes. Here moderately high rainfall and base-rich rock and soil combine to support a range of bryophytes and vascular plants we can only dream about south of the border. Brian's lore of local botanical hot-spots saved much climbing and enabled us to admire choice plants at modest altitudes. On the first day, for instance, our goal was the cliffs of Sron na h-Innearach to the east of Blair Atholl and immediately south of Beinn a'Ghlo. Beguiled, though, along our way by Frog Orchids *Coeloglossum viride*, Meadow Oat-grass *Helictotrichon pratense*, Common Rock-rose *Helianthemum nummularium*, Purple Milk-vetch *Astragalus danicus* and Crested Hair-grass *Koeleria macrantha* on a roadside bank near Loch Maraig, then by a calcareous flush containing Scottish Asphodel *Tofieldia pusilla*, Dioecious Sedge *Carex dioica* and the rare False Sedge *Kobresia simpliciuscula*, we did not reach our destination until after lunch. There Hoary Whitlowgrass *Draba incana*, Three-flowered Rush *Juncus triglumis*, Rock Sedge *Carex rupestris*, Mountain Avens *Dryas octopetala*, Green Spleenwort *Asplenium trichomanes-ramosum*, Alpine Cinquefoil *Potentilla crantzii* and Limestone Bedstraw *Galium sternerii* all told us that the cliffs constitute an altogether better class of botanical neighbourhood, while bryological entertainment came in the forms of *Amblyodon dealbatus*, *Bryum elegans*, *Ditrichum flexicaule*, *Encalypta raptocarpa*, *Isopterygiopsis pulchella*, *Myurella julacea* var. *julacea*, *Mnium marginatum*, *Orthothecium intricatum*, *Plagiobryum zieri*, *Pseudoleskeella catenulata*, *Ptilium crista-castrensis*, *Seligeria doniana*, *S. pusilla* and *Thuidium delicatulum*. Of the liverworts, *Apometzgeria pubescens*, with its beautifully hairy thalli, particularly caught the eye.

Next day we visited Coire Heasgarnich at the west end of the Lawers range - another site rich in mountain plants where one does not need to climb high for botanical fulfilment. Parking near the col east of Beinn Heasgarnich, we soon came upon a large boulder crowned with *Antitrichia curtipendula*. Few-flowered Sedge *Carex pauciflora* appeared in quantity on wet ground, and further on we came across *Andreaea alpina* growing on wet gravel. Progress towards the cliffs in the coire was further slowed by Bog Bilberry *Vaccinium uliginosum*, Sibbaldia *Sibbaldia procumbens*, Cyphel *Minuartia sedoides* and Nordic Bladderwort *Utricularia stygia*, which (despite the note in the 2nd edition of Stace's Flora) seems to be quite frequent in the Highlands. Bladderworts can only be identified to species by examining the conformation of quadrifid cells on the inner walls of their bladders, a procedure which, the bryologist's heart is gladdened to know, requires flower-lovers to use their microscopes.

At length we gained the cliffs which were to provide our sport for the day. Here grew *Anomobryum julaceum* var. *julaceum*, *Bartramia ithyphylla*, *Dicranum scottianum*, *Leptodontium flexifolium*, and the beautiful dark red tints of *Orthothecium rufescens* matched any colour the pretty flowers could muster. *Herbertus stramineus*, *Jungermannia exsertifolia* ssp. *cordifolia*, *Lophozia opacifolia*, *Marsupella emarginata* var. *pearsonii* and *Radula lindenbergiana* represented the liverworts, while choicest of all was the rare *Odontoschisma macounii*, which Ewing first found here in 1900. Nearby, a few beautifully sleek black inflorescences of Scorched Alpine-sedge *Carex atrofusca* and Russet Sedge *Carex saxatilis* drew admiring comment. Returning by way of a shoulder on the hill, Chestnut Rush *Juncus castaneus*, Three-flowered

Rush *Juncus triglumis* and Three-leaved Rush *Juncus trifidus* came before us; we also found Spiked Wood-rush *Luzula spicata*, Tea-leaved Willow *Salix phylicifolia*, Whortle-leaved Willow *Salix myrsinites* and Chickweed Willowherb *Epilobium alsinifolium*.

After a day browsing among the bog-mosses (*Sphagnum* species) at Dunn Moss, north of Blairgowrie, we returned to the hills at Fealar, near Beinn Iutharn Mhor and the watershed between Glen Tilt to the south and Deeside in the north. There we explored rocks similar to those a few miles south at Sron na h-Innearach. Soil and exposed rock by the stream above the Lodge supported *Amblyodon dealbatus*, *Diphyscium foliosum*, *Distichium capillaceum*, *Blepharostoma trichophyllum* and *Preissia quadrata*, while downstream in the ravine *Lophozia longidens* looked very pretty on a horizontal birch bough. *Kiaeria blyttii*, *Orthothecium intricatum* and *Seligeria pusilla* added variety to the mossy scene. Field Gentian *Gentianella campestris* had just come into bloom on a grassy knoll by the Lodge, and we ended our day in the field admiring an immature Golden Eagle toying with its tea while nervously contemplating first take-off into a precipitous ravine below.

Next day we relaxed by the seaside at St Cyrus near Montrose. When lunchtime arrived it was impossible to avoid sitting on a vast carpet of Clustered Bellflowers *Campanula glomerata* which stretched as far as the eye could see. Even so, nature had found room for Maiden Pink *Dianthus deltoides*, Wild Liquorice *Astragalus glycyphyllos*, Bloody Crane's-bill *Geranium sanguineum*, Soft Downy-rose *Rosa mollis*, Sweet-briar *R. rubiginosa*, Crested Hair-grass *Koeleria macrantha*, and the less alluring mouse-ears *Cerastium diffusum* and *C. semidecandrum* along with Babington's Orache *Atriplex glabriuscula* and Knotted Clover *Trifolium striatum*. Then down the coast to Insan on the other side of Montrose for Purple Milk-vetch *Astragalus danicus*, Long-bracted Sedge *Carex extensa*, Distant Sedge *C. distans*, Curved Sedge *C. maritima*, Saltmarsh Flat-sedge *Blysmus rufus*, Slender Spike-rush *Eleocharis uniglumis*, Grass-leaved Orache *Atriplex littoralis*, Sea Couch *Elytrigia atherica* and Lyme-grass *Leymus arenarius*.

For our final day in Scotland we returned to the hills near Lochan na Lairige in Breadalbane, where on another range of base-rich cliffs the rarer species included Mountain Willow *Salix arbuscula*, Net-leaved Willow *S. reticulata*, Mountain Male-fern *Dryopteris oreades*, Moonwort *Botrychium lunaria*, Alpine Woodsia *Woodsia alpina*, Holly-fern *Polystichum lonchitis*, Shady Horsetail *Equisetum pratense*, Blue Moor-grass *Sesleria caerulea*, Alpine Meadow-grass *Poa alpina*, Alpine Mouse-ear *Cerastium alpinum* and Alpine Pearlwort *Sagina saginoides*, as well as other choice plants seen earlier in the week. Meanwhile, for those with more refined botanical taste, a classy cryptogamic collation of *Distichium capillaceum*, *Entodon concinnus*, *Grimmia torquata*, *Hypnum hamulosum*, *Isopterygiopsis pulchella*, *Plagiopus oederianus*, *Apometzgeria pubescens*, *Cololejeunea calcarea*, *Lophozia incisa* and *Radula lindenberghiana* gave lasting pleasure.

We had spent only a couple of hours inspecting each of these choice sites in the Highlands, and one can but wonder how many more mosses and liverworts might come to light in the course of further and more thorough searches by other botanists. Even well and repeatedly explored sites continue to yield species not previously found there. In Herefordshire, for example, numerous bryologists have visited the National Nature Reserve in Downton Gorge - Ley and Watkins in the 19th century, then Armitage and Binstead early in the 20th, the BBS in 1979, and most recently the Border Bryologists - yet species are still being found anew in the gorge. Last year's crop included

Cinclidotus riparius, *Conardia compacta*, *Hennediella stanfordensis* and *Platygyrium repens*, as well as several commoner species recorded there for the first time. Similarly, a return visit to the Rock of Woolbury near Clun (visited by the Border Bryologists in 1995) yielded *Archidium alternifolium*, *Seligeria recurvata*, *Riccia subbifurca*, *Tritomaria quinquedentata* and *Barbilophozia barbata* missed on the first occasion. More still might have been added to the list in better weather. And an autumn call to the wooded ravine at Cleeton St Mary provided *Lophozia sudetica*, *Lejeunea lamacerina* and *Ptilidium pulcherrimum* not noticed in February, while on damp sandstone rock a tiny acrocarp exhibiting similarities to *Campylostelium saxicola* awaits determination. Habitats change so much with the seasons, as well as with the passing years, and every naturalist overlooks some species, which others see more readily. Yet so often we presume that sites are well recorded after a few visits by one or two botanists. The truth is often more humbling.

After our heady days in the Highlands we touched down with a bryological bump at Ludlow in October, beginning a new and more specifically educational agenda aimed at introducing bryological beginners to common species. A variety of lime-loving mosses on a mortared wall along the Linney below Ludlow Castle claimed our attention for half an hour, where *Encalypta streptocarpa*, *Didymodon rigidulus* and *Pseudocrossidium revolutum* numbered among the natives. A strange-looking moss seen creeping about on tarmac by the old swimming pool turned out on microscopic examination to be *Schistidium apocarpum* s.s. We crossed the river to examine common species in the deciduous woodland, where a spring in the mildly basic Aymestry limestone also gave us *Eucladium verticillatum*, *Rhynchostegiella tenella* and *R. teneriffae*. Nearby, *Ctenidium molluscum* and *Trichostomum crispulum* attested alkalinity. After lunch we inspected shady banks beside an old road into Ludlow from the west, now a sunken lane in Mortimer Forest. These sported a range of woodland species characteristic of acidic humus, *Diplophyllum albicans*, *Lepidozia reptans*, *Plagiothecium undulatum*, *Thuidium tamariscinum* and other common calcifuges providing an educational contrast to the morning's calcicoles.

In November we met in Worcestershire for the first time, at Hanley Dingle, a Worcestershire Wildlife Trust reserve a few miles east-south-east of Tenbury Wells. Here several Worcestershire naturalists made their *entrée* to the world of bryology. Old Red Sandstone underlies a band of Psammosteus Carboniferous Limestone in this steep-sided wooded valley, and where the stream has cut down to bedrock, conditions are conducive for *Palustriella commutata* var. *falcata* and *Eucladium verticillatum*, with tufa forming around them. In or near the stream we also found *Rhynchostegiella teneriffae*, *Mnium stellare*, *Fissidens viridulus*, *Didymodon sinuosus*, *Lejeunea cavifolia* and *Leiocolea turbinata*. Elsewhere in the wood *Nowellia curvifolia* grew on a rotting log; this and the *Lejeunea* were new to Worcestershire.

Late in the afternoon, three of our party moved a couple of miles further down the Teme valley to Rock Coppice, another wooded dingle, in which Southstone Rock - a huge block of tufa the size of several houses - promised excitement. Indeed, on returning there in better light a few days later *Eurhynchium schleicheri*, *E. pumilum*, *Brachythecium glareosum*, *Taxiphyllum wissgrillii*, *Mnium marginatum*, *Tortula marginata* and *Plagiochila brittanica* new to Worcestershire succumbed to the spud. But on our initial visit to the Rock we had sought the little weeds by twilight and torchlight. Our endeavours became more frustrating than fulfilling, but entertained an audience of owls, who found them a real hoot, and proved that we are indeed completely off our trolleys.

MARK LAWLEY

NORTH WESTERN NATURALISTS' UNION AND BBS NORTH-WEST GROUP, 1999

As usual, we are indebted to all those who made the arrangements and led the outings.

An outing to Cave Dale, led by Professor Brian Fox - a good friend of our group - was tragically followed by his death from a heart attack only two days later. We shall miss him.

Dr Martha Newton led two outings, to Turton Moor and Beresford Clough, which were, as ever, very popular. She writes: 'A biting cold wind for our excursion to Turton Moor (VC 59) belied the month of May. Nevertheless, it resulted in a gratifying list of over 90 taxa from only one tetrad, in an area where Atlas records are based on 52-131 taxa per 10-km grid square. The area is one of rough grassland, hill stream, flushes, and enough willows to provide habitat for *Ulota crispa*. In addition to seven species of *Sphagnum*, there was an interesting range of wetland species, including *Rhizomnium pseudopunctatum* and those northern and western specialities, *Jungermannia sphaerocarpa* and *Atrichum crispum*. Quite apart from the day's enjoyment, it served to emphasise, not only the need for continuing field work, but also the invaluable boost to local recording that preparations for the new vice-county Flora instigated by the North Western Naturalists' Union have provided'.

Mike Walton took us to the newly designated Mersey Forest: 'A small group spent an enjoyable day walking an area that has been reclaimed from salt-working plants beside the Weaver Navigation. The buried remains of the buildings and various noxious-looking seepages, interspersed with areas of birch woodland, contribute a variety of habitats in a small area. Amongst the finds were *Didymodon tophaceus* growing in a seepage on a grassy bank and *Hennediella heimii* (confirmed a couple of weeks later when in fruit) growing on the soil capping a former waste tip. The area provides a useful reminder that industrialisation need not always be bad news'.

There was rather a poor attendance for John Lowell's outing to Ratten Clough, Cliviger, in VC 59, 'due doubtless to the threatening weather and remoteness of the site; this steep partially wooded clough in the millstone grit was a frequent haunt of John Nowell in the 19th century and many herbarium specimens are labelled from here. Unfortunately many of these treasures are no longer there but we did find *Pohlia elongata*, *Jungermannia sphaerocarpa* and *Atrichum crispum*, as well as *Weissia controversa* in great quantity'.

John also took us to Walker Fold, Bolton, where 'about six members attended and made a significant contribution to the records for the forthcoming VC 59 Flora. While no great rarities were found, the site is remarkably rich (ca 70 species) in view of its proximity to the industrial towns of Lancashire, and healthy colonies of *Ulota crispa* indicate improving air quality. An interesting feature of this generally acidic site is a shale outcrop with a robust growth of *Cratoneuron filicinum* mixed with *Didymodon tophaceus*, which is making a fair attempt at tufa formation due no doubt to calcareous seepage from the shale'.

Martha's outing to Beresford Dale (VC 57) for 'a day on limestone by the infant River Dove, was an enjoyable and worthwhile opportunity to revise some calcicoles. *Plagiobryum zieri* and *Rhytidium rugosum* turned up, but so too did that strong calcifuge of organic substrates, *Dicranum tauricum*. However, the highlight of the day for some of us was the discovery of an

abundance of both male and female inflorescences of *Plagiomnium undulatum*'.

Only five turned up for a visit to Cwm Idwal in Snowdonia, led by Geoff Battershall. Geoff knows the area well and was able to take us to some of the most interesting areas. The most attractive plant was undoubtedly *Orthothecium rufescens* but this was only one of the exciting plants of this classic terrain.

Six members met at the car park adjacent to the Robin Hood on the Baslow-Chesterfield road for Joan Egan's outing to Gardom's Edge. 'We had an enjoyable, if rather repetitive day as far as the more than 50 species were concerned. The area consists of grazed acid grassland, woodland and open moorland which, in spite of recent rain, was comparatively dry. *Barbilophozia floerkii* was a prominent liverwort on the gritstone boulders and we wondered whether this species, as well as *Leptodontium flexifolium*, was increasing or perhaps under-recorded in the past'.

Alan and Norman Bamforth took a group of eight once again into VC 59, to Turnsack Clough on a rather chilly November day when the small valley leading up onto moorland was explored - a rather bleak prospect which nevertheless yielded *Blindia acuta*, which is a good record for the area, and *Barbilophozia atlantica* with copious gemmae, accompanied by much more robust *B. floerkii*. *Leptodontium flexifolium* was found and also *Ulota phyllantha* which is increasing strongly in VC 59 but still scarce.

Tony Smith took us to Jackson's Brickworks, another area reclaimed from past industrial usage and now enthusiastically wardened by Pat Hilton who led us around some old woodland and several artificial wet areas. A useful list of some 40 species, including three species of *Sphagnum*, was obtained despite a day of snow showers and poor visibility.

TONY SMITH

SOUTHERN GROUP

Isle of Wight (VC 10), 26 September 1999

This visit was to the far west of VC 10, and was arranged by Mrs Lorna Snow (BBS recorder for VC 10) and Colin Pope (ecologist with Isle of Wight council). The morning was spent on damp calcareous ground by Alum Bay Chine. The number of species seen was somewhat limited but included *Hypnum lacunosum* var. *tectorum* (new to VC 10) and *Bryum dunense* (only one previous vice-county record). The afternoon was spent at the Needles Battery Point comprising a very small part of a 10-km square which otherwise is all sea. The few mosses there were all new to the square; they included abundant *Trichostomum brachydontium* and also some *Tortella flavovirens* which was the first 'official' post-1950 record.

Leckford Estate (VC 12), 31 October 1999

Barry Goater, who led this meeting, had already recorded many species from the Estate. The River Test runs through it, with meadows and wet woodland adjoining; we looked at these habitats, which were mainly of somewhat limited bryological interest. Bare muddy ground in a meadow produced *Ditrichum cylindricum*, which Barry had not seen on the Estate previously, and

a few plants of a very small form of *Aphanorhegma patens* looking very like *Ephemerum cohaerens* but with much smaller spores. The afternoon visits included an examination of an old chalk pit, which had abundant fruiting *Leiocolea turbinata* and also some *Seligeria calcarea* (for which there are very few records in Hampshire).

Hinton Ampner Estate (VC 11), 28 November 1999

This Estate, belonging to the National Trust, is on the chalk in central Hampshire. The meeting started in the north-west of the Estate in or near parkland. The more interesting finds included *Didymodon nicholsonii* (few records at present in Hampshire) on stonework of a cattle grid, *Microbryum rectum* and *M. floerkeanum* in a stubble field, and *Amblystegium varium* (local in southern England) near the source of the River Itchen. Later the party visited mixed woodland in the south-east of the Estate in the adjoining 10-km square, but added nothing to that square. Thanks are due to Katherine Hearn for leading an enjoyable meeting which was particularly useful to the less experienced participants.

ROD STERN

SOUTH-EAST GROUP

Hemsted Forest (VC15), 23 October 1999

Hemsted Forest is Forestry Commission land situated entirely on Tunbridge Wells Sand. In this area this is a soft yellow or white silty rock which does not form any massive outcrops; valleys are broad and gently sloping with streams running in shallow ditches at the bottom. We explored two 1-km squares, TQ8135 and TQ8235. The day began with heavy showers and leaden skies on a moderate southerly wind, so the five members who attended were stalwart enthusiasts. Fortunately it was very mild, and the weather improved during the meeting with glimmers of sunshine.

We began our survey along a bridleway in TQ8135, which ran south-east through a 50 year old oak plantation to the south, and birch scrub with many young pines to the north. Macrophyte growth was luxuriant, particularly of brambles. *Dicranum scoparium* and *Dicranella heteromalla* formed carpets under the oaks. A steep ditch bank had carpets of *Mnium hornum* with wefts of *Isopterygium elegans* and *Diplophyllum albicans*. *Hypnum jutlandicum* grew on open exposed areas. We were pleased to see troops of the fungus *Amanita citrina*, and a *Hydnum* (probably *H. repandum*).

Into TQ8235 we entered a small area of old sweet chestnut coppice where the stools had *Hypnum resupinatum* and *Tetraphis pellucida*. Our examination of the *Hypnum* prompted an interesting discussion on the recent changes in the taxonomy of this genus. One carpet of *Pleurozium schreberi* was the only evidence we had of this species. A small hollow, clearly originally man-made, had banks carpeted with *Mnium hornum* and *Dicranella heteromalla* and lower down a *Cephaloziella* sp. The fungus *Dendropolyporus umbellatus* on a piece of rotten chestnut wood was of interest, as were troops of a *Cortinarius*, possibly *C. armillata*.

We had lunch sitting on clumps of *Calluna* to keep dry in one of the many rather open heathy

areas, but again dense with macrophyte growth. Afterwards we explored the banks of a small stream set deep in a natural two-foot deep ditch through birch and hazel trees. The understorey was pleasantly free from macrophytes except for occasional Broad Buckler-fern *Dryopteris dilatata* and Lady-fern *Athyrium filix-femina*. *Mnium hornum* and *Atrichum undulatum* carpeted the ground, with *Pellia epiphylla* clothing the banks of the stream, but very little else was found in the fairly deep gloom.

Finally we walked up to the forestry HQ and from a brick wall added *Grimmia pulvinata* and *Tortula muralis* to our list. Near this was the only elder of the day, and on it the only true epiphyte we recorded - a tiny piece of *Orthotrichum affine*. The day produced a total of 39 species, rather a poor total even for the south-east, but beautiful woodlands, and much of interest for the general naturalist and the local bryologists out on the first meeting of the season.

DAVID NEWMAN

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 accommodation.

SPRING FIELD MEETING 2000, Bude, North Cornwall, 12-19 April

Local secretaries: Mrs Jean Paton, Fair Rising, Wagg Lane, Probus, Truro, Cornwall, TR2 4JU; tel: 01726 882164 (for accommodation and transport). Dr David Holyoak, 8 Edward Street, Tuckingmill, Camborne, Cornwall, TR14 8PA; tel: 01209 716042 (for field excursions).

Headquarters: Burn Court Hotel (2-star standard), 12 Burn View Road, Bude, EX23 8DB; tel. and fax: 01288 352872. Tariff: dinner, bed and breakfast £20 per day. This is a special price for members of the BBS and if we can nearly fill the hotel we shall have the accommodation to ourselves. When reserving a bedroom, members should make sure that they mention the British Bryological Society, and please send a £20 deposit. There will be an informal meeting in the bar-lounge at the HQ at about 9 p.m. on Wednesday 12 April, and excursions on each of the following six days. See also *Bulletin* 73: 19-20, 1999.

When reservations have been made, participants should inform Jean Paton where they will be staying, for how many nights and whether they will have a car; this is important because parking space outside the hotel is rather limited and alternative arrangements will have to be made for some cars. Jean will then send a programme and additional information. A provisional programme of excursions, more-or-less in the following order, includes the coast at St Gennys and east of Tintagel, Rough Tor on Bodmin Moor, the coast near Morwenstow and north of Boscastle, and a wooded valley near Boscastle.

Little bryological work has been carried out in North Cornwall since the 1960s and it has not been visited previously by the BBS. There are many interesting coastal sites, valley woodlands nearby, and Rough Tor on Bodmin Moor. Bryophytes recorded in the area include *Acaulon muticum*, *Bryum donianum*, *Campylopus pilifer*, *Coscinodon cribrosus*, *Douinia ovata*, *Fossombronia angulosa*, *F. husnotii*, *Fissidens cellicus*, *Microbryum davallianum*, *Polytrichum alpinum*, *Tortula viridifolia* and *Weissia perssonii*.

SUMMER FIELD MEETING 2000, Grange-over-Sands, Cumbria, 19-27 August

Local secretary: Keith Raistrick, 1 Drewton Avenue, Cross Cop, Heysham, Lancs, LA3 1NU; tel: 01524 423325.

This meeting will (like the 1995 Spring Meeting at Ambleside) concentrate on the less well-known SSSIs, Cumbria Wildlife Trust Reserves, and National Trust sites in Westmorland with Furness. It is a varied programme which will include interesting rocky woods, ravines and, as the August weather is usually kind (!), it should allow one or two trips onto the higher ground with some upland tarns. We are into a second year of a survey covering tetrads, which in that time has produced several new vice-county records, and a number of refound 'bracketed' species - it has not proved difficult to find new records. Except for the few extensively, and repeatedly, bryologised 'classic' sites the county is very much under-recorded. It is hoped that this meeting will help redress the imbalance; the records gained will be a valuable addition to the Bryoflora of Westmorland project. When you consider recent finds, such as *Plagiochila killarniensis* and *P. atlantica*, almost anything in Westmorland seems possible.

Grange-over-Sands is an attractive coastal resort in a limestone region on the north side of Morecambe Bay in Furness (VC 69). The headquarters for this meeting will be the Field Studies Council, Castle Head Centre, Grange-over-Sands, Cumbria, LA11 6QT; tel: 0153 953 4300; fax: 0153 953 6662. While other accommodation is available locally attendees are encouraged to stay at the centre. Laboratory facilities will be available.

Those wishing to attend should contact the local secretary to book, and are encouraged to do so as early as possible, as accommodation at the centre is limited and sharing of rooms may be required if the turnout is large.

ANNUAL GENERAL MEETING AND SYMPOSIUM MEETING 2000, University of Reading, 8-10 September

Local secretary: Dr Seán O'Leary, J.J. Thompson Physical Laboratory, PO Box 220, Whiteknights, Reading, RG6 6AF; tel: 01189 318576; e-mail: s.v.oleary@reading.ac.uk.

The AGM will take place at the Department of Plant Sciences of the University of Reading, set within the beautiful Whiteknights Park. Accommodation will be provided at one of the nearby student halls of residence, on campus, about 15 minutes walk away. The Sunday excursion is likely to be either in the Chilterns area, or, if possible, to Greenham Common. Further details are available from the local secretary and will be published in the next *Bulletin*.

BRYOLOGICAL WORKSHOP 2000, Imperial College at Silwood Park (near Ascot, Berkshire), 11-12 November

Local secretary: Dr Jeffrey W. Bates, Department of Biology, Imperial College at Silwood Park, Ascot, Berkshire, SL5 7PY; tel: 01344 294228; e-mail: j.bates@ic.ac.uk.

The theme of this year's workshop will be bryological illustration. Further details will be provided in the next *Bulletin*.

LOCAL MEETINGS PROGRAMME, 2000

NORTH WESTERN NATURALISTS' UNION BRYOPHYTE AND LICHEN GROUP & BBS NORTH-WEST GROUP

All meetings are on Saturdays and commence at 10.30 a.m. Please bring a packed lunch. Those attending should make contact beforehand to confirm/arrange meeting places, and must have adequate protective clothing. Some places have restricted or private parking.

8 April: DEEP DALE. Meet at SK104725. Dr Martha Newton.

20 May: WYCOLLER, TRAWDEN. Meet in the car park at SD925396. Alan & Norman Bamforth.

10 June: ECTON, STAFFS. Meet at SK097582. Norman Bamforth.

22 July: PRIMROSE HILL, KELSALL. Meet in the car park on the A54 at SJ540688. Mike Walton.

August. No meeting.

16 September: CATLOW BROOK, EAST OF NELSON. Meet at SD901365. Dr Martha Newton.

14 October: MARSHALL'S ARM, HARTFORD. Meet at SJ651722 (confirm parking place with leader). Tony Smith.

11 November: RISLEY MOSS. Meet at SJ665921. Audrey Locksley.

2 December: YARROW VALLEY, CHORLEY. Meet in the Tesco Car Park, Foxhole Road off the A581, west of Chorley, SD565182. Diana Downing.

Contacts: Owen McCann (NWNU) (0161 962 1226); John Lowell (0161 485 6892); Tony Smith (01663 744499)

OTHER BRYOLOGICAL MEETINGS, 2000

17-19 March: INTRODUCTION TO MOSSES AND LIVERWORTS. Tutor: Dr Martha Newton, Rhyd-y-creuau, Drapers' Field Centre, Betws-y-coed, Conwy, LL24 0HB. Especially for beginners, but others welcome too. Details from the Warden, Mr J. Ellis.

19-21 May: *SPHAGNUM* WEEKEND. Tutor: Dr Martha Newton, Rhyd-y-creuau, Drapers' Field Centre, Betws-y-coed, Conwy, LL24 0HB. A chance to learn how to recognise most of

- the British species in the field, and to study them alongside keys. Details from the Warden, Mr J. Ellis.
- 24-31 May: MOSSES AND LIVERWORTS. Tutor: Dr Martha Newton, Orielson Field Centre, Pembroke, Pembrokeshire, SA71 5EZ. Offering individual guidance at all levels. Details from the Warden, Dr R.G. Crump.
- 8-15 July: MOSSES AND LIVERWORTS. Tutor: Dr Martha Newton, Kindrogan Field Centre, Enochdu, Blairgowrie, Perthshire, PH10 7PG. Offering individual guidance at all levels. Details from the Warden, Mr N. Morgan.
- 15-19 July: *SPHAGNUM* MOSSES. Tutor: Dr Martha Newton, Kindrogan Field Centre, Enochdu, Blairgowrie, Perthshire, PH10 7PG. Three days to practise field identification of most species of this ecologically important genus. Details from the Warden, Mr N. Morgan.
- 21-24 July: MOSSES AND LIVERWORTS OF GRASSLAND AND MOORLAND. Tutor: Dr Martha Newton, Malham Tarn Field Centre, Settle, North Yorkshire, BD24 9PU. An opportunity to concentrate on characteristic ecological indicator species. Details from the Warden, Mr C. Jones.
- 24-28 July: WOODLAND MOSSES AND LIVERWORTS. Tutor: Dr Martha Newton, Malham Tarn Field Centre, Settle, North Yorkshire, BD24 9PU. A chance to compare the species of a wide variety of natural and semi-natural woodlands. Details from the Warden, Mr C. Jones.
- 28 July - 4 August: 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.
- 12-19 August: MOSSES AND LIVERWORTS. Tutor: Dr Martha Newton, Blencathra Field Centre, Threlkeld, Keswick, Cumbria, CA12 4SG. Offering individual guidance at all levels. Details from the Warden, Dr R. Lucas.
- 1-8 September: UNDERSTANDING CONSERVATION THROUGH BRYOPHYTES. Tutor: Dr Martha Newton, Rhyd-y-creuau, Drapers' Field Centre, Betws-y-coed, Conwy, LL24 0HB. Offering individual guidance at all levels. Details from the Warden, Mr J. Ellis.
- 9-16 August (provisional dates): BOTANICAL MEETING AT ARDTORNISH, MORVERN (by kind invitation of Faith Raven). Leader: Brian Brookes. Ardtornish is an estate on Morvern, a peninsula on the west coast of Scotland opposite Mull, south-west of Fort William. Its mires, woods, cliffs and coast carry an exceptionally varied flora. For bryologists, the hepatic mats and tiny liverworts in the moist ravines are particularly choice. If the remote splendour of a Scottish mansion and countryside sounds like your sort of holiday, contact Brian Brookes at Borelick, Trochry, Dunkeld, Perthshire, PH10 0BX; tel: 01350 723222. Inclusive cost will be in the region of £375.

COUNCIL NEWSLETTER NUMBER 16

A tremendous amount of work has been undertaken this year, some of it culminating in hoped-for success. Much of it, however, has failed to achieve its goal but, in doing so, has highlighted areas of concern that Council has now begun to rectify. In keeping you abreast of developments, I must

inevitably tell you of Council's disappointments, but it would be wrong to dwell on them unduly for, while we can learn from setbacks, it is on significant achievements that the future of the Society will be built.

Before going into details of Council's work, I must report the sad loss through death of one of our most eminent members, Dr Eric Watson. He will be greatly missed, but remembered with gratitude by so many of us who were dependent on his book in our early days as bryologists.

Bryophyte Recording

I think you will agree that this is one of the most eagerly pursued activities of the Society. Because of that, there has been great concern for some time about the difficulty of updating and accessing data supplied to the Biological Records Centre (BRC). It is therefore good to know that real progress appears to have been made. Not only has agreement been reached between the National Biodiversity Network, the Institute of Terrestrial Ecology, and the Joint Nature Conservation Committee to fund a three-year post at BRC, but it has been decided to use bryophyte data in a pilot scheme. An appointment has already been made, and completion of the first project is expected by March 2000.

Journal of Bryology

Considerable optimism for the continued evolution of the *Journal of Bryology* is evident in the first year's issues in its enlarged and modernised format. What was originally published once a year as the *Transactions of the British Bryological Society* has now become a quarterly publication with the assistance of the new agreement with W.S. Maney & Son Ltd. On the success of this venture hangs the success of the Society's greatest scientific and financial commitment, and we wish it well.

Stocks of BBS Journals

Undoubtedly the most worrying aspect of Council's work over the past few years has centred on its dispute with our former publisher of the *Journal of Bryology*, concerning large stocks of back-numbers that were shown in an inventory to have disappeared. Acting cautiously, with legal advice throughout, BBS officers have been faced with an incredible work-load and are now unable to look forward to a successful outcome. The case has not been heard but appears to have been resolved against us on a technicality, although it is still in the hands of our solicitor. At the moment, however, it can be said that this traumatic episode has served to emphasise serious shortcomings in the continuity of business between successive officers. Measures have therefore been taken to ensure that business practice in future will always match the demands that might be put on it.

E.W. Jones' Bryological Books

The scheme devised by Council to meet Dr Jones' wishes for the distribution of books he left to the Society was ably implemented by Mr Tom Blockeel, and raised some £700 to £800.

Meetings

Forming the nub of the Society, an attractive programme of meetings was put forward with the help of local organisers in 1999. The spring meeting in Abergavenny and the AGM in Manchester were particularly favoured by good attendances. Liverpool Museum's good fortune with funds for building work, however, was the Society's misfortune, in necessitating cancellation of the Bryological Workshop. Let us hope that we shall be invited back on a future occasion to explore the links between the BBS and the bryophyte collections at Liverpool.

While there can be no doubt that the Society has suffered a serious setback this year, I believe it can go forward more strongly. To do so, Council itself must maintain its resolve to implement sound business practices. Just as important, however, are the continued support and help of members who assist Council in gearing its efforts to the requirements of the membership as a whole. I hope my successors will enjoy the benefit of your assistance.

MARTHA NEWTON

RECORDING MATTERS 17

It is a year since *Recording Matters 16* appeared in *Bulletin 72*, and there are a few changes to the Regional Recorders list:

27: John Mott, 62 Great Melton Road, Hethersett, Norwich, NR9 3HA.

37: Martin Godfrey, 11 Cordingley Close, Churchdown, Gloucestershire, GL3 2EN.

38: Johnny Turner, 1 Balliol Close, Woodbridge, Suffolk, IP12 4EQ.

76,77: Keith Watson, Science Dept, Glasgow Museum & Art Gallery, Kelvingrove, Glasgow, G3 8AG.

Many thanks to Robin Stevenson for all his past work on VC 27, but with the completion of his bryophyte flora in the recently published Norfolk Flora, he has decided (for a well-earned rest no doubt) to pass East Norfolk over to John Mott.

In the last Regional Recording list there was a mistake in one of the addresses; apologies to Howard and the correct entry should be:

13,14: Howard Matcham, 21 Temple Bar, Strettington, nr Chichester, W Sussex, PO18 0LB.

I would like to welcome the new Regional Recorders and wish them well in their new roles. This now leaves the following vice-counties in England and Scotland vacant: 39, 56, 71, 75, 78, 85, 89, 90, 91, 93, 94, 95, 106, 107, 109, 112. Apart from H36-40, Ireland is wide open. Keep those record cards coming into me; the Biological Records Centre (BRC) is busily engaged in adding your data to the national database.

During the latter half of 1999 there was welcome progress with supply of vice-county data from

BRC. I would like to thank Chris Preston for arranging this. Most of those who responded to the announcement in *Recording Matters 16* inviting requests for data, as well as a few others who had lodged requests earlier, now have their data. I can also supply Recorder Codes (so you know who made a particular record) for those who do not have them. It is anticipated that they will also soon be available on the Web. BRC is now actively developing a new system for data access (more below!), so any further requests for data in the short term will be put on hold.

In *Bulletin 72* I reported on a meeting I had with BRC, and the decision to develop a Memorandum of Agreement with the BBS. This remains a possibility, but has somewhat been eclipsed by a more exciting proposal from BRC to include the bryophyte database (held at BRC) in a pilot project for the National Biodiversity Network (NBN) gateway. The NBN gateway is intended to provide access to the UK's biodiversity data. It is essentially a web site that allows a user to search and retrieve metadata (data about data suppliers and datasets) and actual record data from BRC and other sources. There are a lot of details to be finalised but Jonathan Cooper of BRC is working on it; it should be operational by the end of January 2000 and a full demonstration version should be ready by March. Whether there will be one person within the BBS (such as the Recording Secretary) who has access to the gateway and who would then supply data to members, or whether all Recorders would have access, is an issue to be resolved; issues of security and access to sensitive data will also have to be considered. This promises to deliver tangible results, and the BBS is delighted to be part of the pilot project.

Ron Porley, English Nature, Foxhold House, Crookham Common, Thatcham, Berkshire, RG19 8EL; e-mail: ron.porley@english-nature.org.uk.

ELECTION OF OFFICERS AND ELECTED MEMBERS OF COUNCIL

The terms of six Officers, the Bulletin Editor, Journal Editor, Meetings Secretary, Reading Circle Secretary, Recorder for Hepatics, and Recorder for Mosses, expire at the end of 2000. The present incumbents are all eligible for re-election. There is also a vacancy for Membership Secretary, created by the election of Mr M.A. Walton as General Secretary. Mr M. Pool is currently serving in an acting capacity, and is eligible for election as Membership Secretary. Two Elected Members of Council will retire at the end of 2000, and neither Dr A.E. Newton nor Dr F.J. Rumsey is eligible for re-election until two years have elapsed. There is also a third vacancy for Elected Membership caused by the appointment of Mr M. Pool as acting Membership Secretary. Members are invited to submit nominations for Officers and Elected Members, sending them to the General Secretary of the BBS, Mr M.A. Walton, Ivy House, Wheelock Street, Middlewich, Cheshire, CW10 9AB, to arrive no later than 12 August 2000. A nomination must not be made without the consent of the person whom it is wished to nominate. If elections are needed, they will be held at the AGM in Reading, on 9 September 2000.

BBS LIBRARY SALES AND SERVICE, 2000

FOR LOAN (UK Members only)

Members wishing to borrow books or papers are advised to consider whether a photocopy 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 minimise loss or damage.
- c) Microscope stage-micrometer slide for calibration of eyepiece graticules. 10µm divisions. Loan deposit £45.00.

FOR SALE

Bulletins and journals

British Bryological Society *Bulletins*: back numbers from no 23 @ £1.00 each.

Transactions of the British Bryological Society/Journal of Bryology:

Vol. 1: parts 1-4	£2.40 each; part 5 out of print
Vol. 2: parts 1-4	£3.00 each
Vol. 3: parts 1-5	£2.40 each; £12.00 per volume
Vol. 4: parts 1,3-5	£2.40 each; part 2 out of print
Vol. 5: parts 1,3	£3.00 each; parts 2 & 4 out of print
Vol. 6: parts 1-2	£6.00 each; £12.00 per volume - ends series of <i>Transactions</i>
Vol. 7: parts 1-4	£5.00 each; £20.00 per volume - renamed <i>Journal of Bryology</i>
Vol. 8: parts 2,3	£5.00 each; parts 1 & 4 out of print
Vol. 9: parts 1-3	£5.00 each; part 4 out of print
Vol. 10: parts 1,3,4	£8.00 each; part 2 out of print
Vol. 11: parts 1-3	£10.00 each; part 4 out of print
Vol. 12: parts 1-3	£11.50 each; part 4 out of print
Vol. 13: parts 1-4	£15.50 each; £62.00 per volume
Vol. 14: parts 2-4	£18.00 each; part 1 out of print
Vol. 15: parts 1-4	£22.50 each; £90.00 per volume
Vol. 16: parts 1-4	£29.75 each; £119.00 per volume
Vol. 17: parts 1-4	£39.50 each; £158.00 per volume
Vol. 18: parts 1-4	£42.25 each; £169.00 per volume
Vol. 19: parts 1-4	£47.25 each; £189.00 per volume
Vol. 20: parts 1-2	£49.50 each; £99.00 per volume (only 2 parts)

As from *J. Bryol.* Vol. 21 inclusive, back issues will only be available from our publisher, Maney Publishing, Hudson Road, Leeds, LS9 7DL, UK.

BBS Special Volumes

Volume 1. Longton RE, Perry AR. 1985. <i>Proceedings of Jubilee Meeting 1983</i> , 89 pp.	£6.00
Volume 2. Newton, ME. 1989. <i>A practical guide to bryophyte chromosomes</i> , 19 pp.	£2.50
Volume 3. O'Shea, BJ. 1989. <i>A guide to collecting bryophytes in the Tropics</i> , 28 pp.	£3.50
Volume 4. Edwards, SR. 1992. <i>Mosses in English literature</i> , 44 pp.	£2.50
Volume 5. Edwards, SR. 1997. <i>English names for British bryophytes</i> .	£3.50

Census Catalogues

Duncan, JB. 1926. <i>Census catalogue of British mosses</i> , 2nd edition.	20p
Sherrin, WR. 1946. <i>Census catalogue of British Sphagna</i> .	20p
Warburg, EF. 1963. <i>Census catalogue of British mosses</i> , 3rd edition.	20p
Paton, JA. 1966. <i>Census catalogue of British hepatics</i> , 4th edition.	20p
Corley MFV, Hill, MO. 1981. <i>Distribution of bryophytes in the British Isles: a census catalogue of their occurrence in vice-counties</i>	£5.00
Blockeel TL, Long DG. 1998. <i>A check-list and census catalogue of British and Irish bryophytes</i> .	£7.50

Other items

Adams, KJ. <i>Microscope techniques for the bryologist. Part 1. A beginner's guide</i> .	Price incl. p&p: £1.00
Evans, DE, Perry, AR. 1987. Moss Wall Chart.	£2.80
Grolle, R. 1983. <i>Hepatics of Europe and the Azores: an annotated list of species with synonyms</i> .	Price incl. p&p: £2.50
Newton, ME <i>et al.</i> , eds. 1988. <i>Bryology: modern research and the ways forward</i> .	£5.50
Pearman, MA. 1979. <i>A short German-English bryological glossary</i> .	50p
Perry, AR. 1992. <i>Mosses and liverworts of woodland</i> , 41 pp.	£4.00
BBS tie, claret with single BBS logo	£4.95
Swift x20 handlens and case	£18.75
Patterson no 2 stainless steel forceps	£4.00
Idealtek no 3 stainless steel forceps	£7.25
Eyepiece graticule 1 cm x 10 micrometer, 16 mm diameter	£25.00
BBS car stickers	£1.00 & SAE

PLEASE DO NOT INCLUDE CASH WITH ORDERS. Customers will be invoiced for the correct amount including p&p (postage and packing is extra unless stated). A legibly printed address label would be appreciated. All the above are available from the BBS librarian:

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

BBS READING CIRCLE

Details of the Reading Circle and sample journal content lists are available from the Reading Circle secretary.

May I remind members of the Reading Circle that their accounts must be kept in credit; a prompt response to reminders that a balance is low would be appreciated. Please also remember that requests for copies of papers must be made on Copyright Declaration forms. If you have run out, supplies of these are available from the Reading Circle secretary, at the address below.

Richard Fisk, 1 Paradise Row, Ringsfield, Beccles, Suffolk, NR34 8LQ.

REFEREES (FEBRUARY 2000)

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 to 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 Tim Blackstock for hepatics (Countryside Council for Wales, Plas Penrhos, Ffordd Penrhos, Bangor, Gwynedd, LL57 2LQ) or Mr Gordon Rothero for mosses (Stronlonag, Glenmassan, By Dunoon, Argyll, PA23 8RA).

The numbers below refer to genera in *A Check-list and Census Catalogue of British and Irish Bryophytes* by T.L. Blockeel & D.G. Long (1998).

GENERAL REFEREE

H.W. Matcham, 21 Temple Bar, Strettington, near Chichester, W Sussex, PO18 0LB.

HEPATIC REFEREES

- 1, 64-69, 75-82:** Dr M.E. Newton, c/o Department of Botany, Liverpool Museum, William Brown Street, Liverpool, L3 8EN. (All mail to be marked 'Private'.)
- 2-5, 9, 11-17, 52:** T.L. Blackstock, Countryside Council for Wales, Plas Penrhos, Ffordd Penrhos, Bangor, Gwynedd, LL57 2LQ.
- 6-8, 10, 18, 19, 32, 36-38, 50, 51, 53, 83-86:** D.G. Long, Royal Botanic Garden, Inverleith Row, Edinburgh, EH3 5LR.
- 20-29, 39, 45, 46:** M.F.V. Corley, Pucketty Farm Cottage, Faringdon, Oxfordshire, SN7 8JP.
- 30, 31, 33-35, 47-49, 70-74:** G.P. Rothero, Stronlonag, Glenmassan, By Dunoon, Argyll, PA23 8RA.
- 40-44, 54-63:** N.G. Hodgetts, Joint Nature Conservation Committee, Monkstone House, City Road, Peterborough, PE1 1JY.

MOSS REFEREES

- 1-10, 156-160:** Dr M.O. Hill, Monks Wood Experimental Station, Abbots Ripton, Huntingdon, PE17 2LS.
- 11-33:** G.P. Rothero, Stronlonag, Glenmassan, By Dunoon, Argyll, PA23 8RA.
- 34, 35, 67-70, 187-195:** Dr A.J.E. Smith, School of Biological Sciences, Brambell Building, University College of North Wales, Bangor, Gwynedd, LL57 2UW.
- 36, 71-89, 104-111:** N.G. Hodgetts, Joint Nature Conservation Committee, Monkstone House, City Road, Peterborough, PE1 1JY.
- 37-66:** Dr D.F. Chamberlain, Royal Botanic Garden, Inverleith Row, Edinburgh, EH3 5LR.
- 90-98, 112:** Vacant.
- 99-103:** A. Orange, Department of Biodiversity & Systematic Biology, National Museum & Gallery Cardiff, Cathays Park, Cardiff, CF1 3NP.
- 113-146:** R.D. Porley, English Nature, Foxhold House, Crookham Common, Thatcham, Berkshire, RG15 8EL.
- 147-155, 161-174:** T.L. Blockeel, 9 Ashfurlong Close, Dore, Sheffield, S17 3NN.
- 175-186:** D.T. Holyoak, 8 Edward Street, Tuckingmill, Camborne, Cornwall, TR14 8PA.

LETTER FROM MICHAEL FLETCHER

I am pleased to say that my slow and unexpected recovery from a brain tumour continues. Since this spring, I have increasingly been able to live to a normal daily routine, and to tackle simple tasks in the house and garden. I have also begun once again to maintain, and to take an interest in, my living plant collections. The infrastructure for the moss collection remains largely intact, and they have been adequately lit, shaded, and watered since this spring. In spring 1998 I made a will in which the live plants, and the associated herbarium, documents and materials, were bequeathed to Royce Longton at Reading University, or to his successor there. I hope that, some time soon, there will be a permanent, comprehensive, living collection of British bryophytes, at least, in an institution where its continuity, and the long-term survival of any rare, decreasing or

endangered species it contains, can be assured.

I have not yet started the very large task of replanting and re-cataloguing this collection. My eyesight has been damaged by my illness, and I am now even registered as partially sighted. However, it is improving slowly, and it is already plain that most of the hepatics, Sphagna and Hookeriales have died, but that most other mosses here have survived, if only in small quantities. Such damage is consistent with the plants drying out for long periods.

Nevertheless, the survival of so many bryophytes seems astonishing, especially as in 1995, a few months before I became ill, the large overshadowing lime trees were felled. For the next three summers the greenhouse had no effective shading, and only intermittent watering, by my wife, who had many other more urgent preoccupations. So hot did the greenhouse become at times, that on parts of the top shelf on the south side, plastic seed trays and flower pots have melted and become deformed.

Nevertheless, this collection still remains probably the largest of its kind in the world, and still contains many exotic, rare or even endangered species. I now hope for a few more years to enjoy it, to maintain it, and perhaps to replace lost plants. Especially sad has been the loss of hepatics, alpine and far oceanic plants from habitats I am unlikely to visit again, and of many lovely plants from other countries, notably New Zealand, which I am unlikely to replace. Once the collection is again well under control, and its future assured, I may make requests to members, individually, for help in replacing some of these plants.

I am sorry that some people, perhaps including BBS members, have asked for copies of my *Moss Grower's Handbook*, and been disappointed. I hope it will be available again soon.

I am grateful to Royce Longton for taking me to the symposium on *ex situ* bryophyte conservation at Wakehurst Place, even though I remember very little about it, and was not yet able to contribute anything useful to the proceedings. I look forward to attending more BBS meetings, and to meeting old friends again.

*Michael Fletcher, 70 South Street, Reading, RG1 4RA.
12 November 1999.*

[Editor's note: Many members of the BBS will have met, or corresponded with, Michael Fletcher over the years. We all wish him well in his continued recovery from his illness.]

THE PHOTOGRAPHS ON THE COVER OF JEAN PATON'S *THE LIVERWORT FLORA OF THE BRITISH ISLES*

Two of these photographs were taken on BBS excursions. *Herbertus aduncus* ssp. *hutchinsiae* was photographed on the north side of Cadair Idris, Merioneth (VC 48), on 7 August 1989, during the summer meeting that year based in Aberystwyth. I photographed the *Scapania nemorea* on the top of a wall, where it had been found by Peter Martin, by a stream in Hannaston Wood, 3 km

north-west of Dalry, Kirkcudbrightshire (VC 73), on 2 August 1993, during the meeting based at Castle Douglas.

The other two photographs were taken on the excursions from Cambridge initiated by Paul Richards (see *Bulletin* 55: 39, 1990). *Cephalozia bicuspidata* was photographed in Bedford Purlieus, Soke of Peterborough (VC 32), on 11 March 1989, and *Lunularia cruciata* in Barrington churchyard, Cambridgeshire (VC 29), on 11 November 1989.

All the photographs are published at a magnification of x8.

HAROLD WHITEHOUSE

AN INTERESTING PYRENOMYCETE GROWING ON *CERATODON PURPUREUS*

Whilst looking at bryophytes on Maid's Cross Hill near Lakenheath, West Suffolk in June 1999, I came across a patch of *Ceratodon purpureus* that appeared to have blackish gemmae in the leaf axils. A closer scrutiny revealed that they did not have the appearance of any gemmae that I had seen, in fact they were more like frass left by some browsing invertebrate. At home, under the microscope, they were clearly ascocarps of some tiny fungus and contained asci with large spores. I initially sent it to Mrs P. Ellis who told me it was a pyrenomycete but was unable to name it. At her suggestion I sent it to Brian Spooner at Kew. He has named it *Bryostroma trichostomi* (Roll.) Döbbl. It has been recorded from various European countries, including France and Germany, but not previously from the British Isles. Recorded hosts have been various species of *Barbula*, *Tortula* and *Trichostomum*.

RICHARD FISK

RECENT DEATHS

It is with regret that the deaths are announced of:

Dr M.H. Fulford, a former long-standing member of the BBS, who made valuable contributions to the understanding of Latin American hepatics in the post-war years.

Dr E.V. Watson, an honorary member, and member of the BBS since 1946, whose invaluable book, *British Mosses and Liverworts*, has done so much to encourage an interest in bryophytes.

Dr H.L.K. Whitehouse, an honorary member, a member of the BBS since 1946 and an eminent geneticist who was best known to bryologists for his pioneering work in the study of mosses with rhizoidal tubers.

COLLATION OF RECORDS OF *LOPHOCOLEA SEMITERES*

A spate of recent records of *Lophocolea semiteres* indicates that this species may be spreading in mainland Britain on a serious scale. Accordingly, it has been decided to collate all new records, in an attempt to plot its progress, both spatially and temporally. I have agreed to co-ordinate the collation of these records.

Accordingly, I would be grateful if details of all new records for this species could be sent to me. New vice-county records I can pick up from the *Bulletin*. However, I am also interested in new localities from vice-counties in which it has already been recorded. Ideally I would like details of habitat, size and sex of populations, associated species, date of collection, and any other relevant information.

Robin Stevenson, 111 Wootton Road, King's Lynn, Norfolk, PE30 4DJ; e-mail: crstevenson@x-stream.co.uk.

THE *SCHISTIDIUM APOCARPUM* COMPLEX IN THE BRITISH ISLES

A.J.E. SMITH

5 Queens Gardens, Llandudno, Conwy, LL30 1RU

INTRODUCTION

In his monograph of the *Schistidium apocarpum* complex, Blom (1996) recognised 31 species, and an additional two species appear in his account in Nyholm (1998). Thirteen species, one subspecies and one variety are currently reported from the British Isles. Undoubtedly, further species will be added to these in due course. As some members of the BBS may not have access to H. Blom's monograph or Elsa Nyholm's *Illustrated Flora of Nordic Mosses*, I thought it would be useful to publish a key to the taxa recorded from Britain and Ireland, together with brief descriptions (giving only the most useful characters). These are based upon the examination of about 300 British specimens, supplemented by information from Blom (in Nyholm, 1998) where material has not been adequate.

Current data on the distribution of *S. apocarpum* and *S. confertum* in the British Isles are unacceptable as many specimens so named belong to other species of the complex. A few specimens of *S. strictum* are referable to *S. papillosum* but current records for that species are otherwise acceptable. A list of vice-county records based on the specimens I have examined, some named by H. Blom, is given at the end of this paper. These records have been lodged with the Recorder for Mosses.

In the following account taxa have been numbered according to the recently published *Census Catalogue* (Blockeel & Long, 1998).

NOTES ON THE IDENTIFICATION OF SPECIES

Care should be taken that vegetative and perichaetial leaves are not confused as they usually differ markedly in shape and areolation. Leaf descriptions are of upper leaves; lower leaves may have shorter hyaline points or be epilose and, in the case of species with papillose cells, the papillae may have been lost. Several leaves should be examined, especially for the detection of marginal teeth. The relative degree of thickening of the longitudinal and transverse walls of the basal marginal cells of the leaves is a very useful character, particularly when taken in conjunction with the shape of the exothecial cells in the lower half of the capsule. Capsule shape is of moist capsules that have not been placed under a cover-slip – doing so will flatten them and considerably alter their shape. Capsule shape and dimensions exclude the capsule lid. Careful comparison should be made with the descriptions as it is possible that species additional to those currently reported from the British Isles may be found. It should also be borne in mind that mixed gatherings may cause confusion.

KEY TO BRITISH AND IRISH TAXA OF THE *SCHISTIDIUM APOCARPUM* COMPLEX

- | | | |
|---|--|-----------------------------|
| 1 | Mid-leaf cells 8-12 μm wide | 2 |
| | Mid-leaf cells mostly 6-8 μm wide | 14 |
| 2 | Leaf margins toothed (sometimes bluntly and obscurely so), papillose-denticulate or papillose towards apex | 3 |
| | Leaf margins entire towards apex | 7 |
| 3 | Basal marginal cells of leaves with transverse walls more strongly thickened than longitudinal walls, exothecial cells in lower half of capsules shortly rectangular | |
| | <i>S. crassipilum</i> (68.16) | |
| | Basal marginal cells with walls \pm uniformly thickened, exothecial cells in lower half of capsules \pm isodiametric or wider than long | 4 |
| 4 | Plants dull green to brownish or black, leaf margins often bluntly toothed towards apex, cells smooth | 5 |
| | Plants usually reddish or rust-coloured, margins papillose or papillose-denticulate towards apex, cells sparsely to densely papillose | 6 |
| 5 | Plants dull green to brownish, columella falling with lid | <i>S. apocarpum</i> (68.5) |
| | Plants blackish, columella persisting | <i>S. trichodon</i> (68.6) |
| 6 | Leaf cells strongly papillose on abaxial side, papillae on abaxial side of costa tall (to 10 μm high) in upper part of leaf, capsules 1.5-2.0 times as long as wide | <i>S. papillosum</i> (68.7) |
| | Leaf cells sparsely papillose, papillae on abaxial side of costa low (to 5 μm high) in upper part of leaf, capsules 1.1-1.4 times as long as wide | <i>S. strictum</i> (68.9) |
| 7 | Basal marginal cells of leaves with walls of \pm uniform thickness | 8 |
| | Basal marginal cells with transverse walls more strongly thickened than longitudinal walls | 10 |
| 8 | Perichaetial leaves ¹ broad, lingulate-lanceolate to ovate, \pm concealing capsules in side view, exothecial cells isodiametric or wider than long in lower half of capsule | |
| | <i>S. apocarpum</i> (68.5) | |
| | Perichaetial leaves long and narrow, ligulate-lanceolate, not concealing capsules in side view, exothecial cells variable in shape | 9 |

¹If perichaetial leaves are lacking it will become apparent in subsequent dichotomies where plants under investigation belong.

- 9 Plants not hoary when dry, hyaline points of leaves narrow, 0-150 μm long, cell walls esinuose or sinuose *S. dupretii* (68.10)
Plants somewhat hoary when dry, hyaline points coarse, 0.4-1.6 mm long, cell walls strongly sinuose *S. robustum* (68.11)
- 10 Readily disintegrating black tufts, leaves dark brown, opaque above *S. atrofusum* (68.15)
Plants not as above 11
- 11 Basal marginal cells shortly rectangular to wider than long, not forming a conspicuous band, exothelial cells shortly rectangular in lower half of capsules 12
Basal marginal cells rectangular, hyaline, with very strongly thickened transverse walls forming a conspicuous band usually one cell wide, exothelial cells variable in shape 17
- 12 Plants not hoary when dry, leaves ovate to lanceolate, acute, hyaline points flattened below, usually decurrent down margins *S. crassipilum* (68.16)
Plants often somewhat hoary when dry, leaves lanceolate or narrowly lanceolate, acuminate, hyaline points terete, not decurrent down margins 13
- 13 Mats or decumbent tufts, hyaline points spinulose-denticulate, costa moderately thick, 45-65 μm wide in lower part of leaf *S. elegantulum* ssp. *elegantulum* (68.17a)
Dense tufts, hyaline points spinulose with very small spinulae, costa stout, 75-90 μm wide in lower part of leaf *S. elegantulum* ssp. *wilsonii* (68.17b)
- 14 Leaf margins, costa and cells papillose above, basal marginal cells not hyaline, walls of \pm uniform thickness *S. pruinsum* (68.8)
Papillae absent, basal marginal cells with transverse walls more strongly thickened than longitudinal walls 15
- 15 Perichaetial leaves plicate, capsules apparently gymnostomous with conspicuously red mouths *S. flaccidum* (68.13)
Perichaetial leaves not plicate, capsules with peristomes 16
- 16 Basal cells of leaves 20-40 μm long, cells above not or hardly sinuose, exothelial cells in lower half of capsules shortly rectangular *S. confertum* (68.12)
Basal cells of leaves 35-75 μm long, cells above usually sinuose, exothelial cells in lower half of capsules irregular in shape 17
- 17 Capsules 1.4-2.1 mm long excluding lid, 1.2-1.5 times as long as wide, costa of perichaetial leaves percurrent or excurrent, stems hardly branched *S. frigidum* var. *frigidum* (68.14a)
Capsules 0.5-0.6 mm long, 0.9-1.2 times as long as wide, costa of perichaetial leaves ending below apex, stems much branched *S. frigidum* var. *havaasii* (68.14b)

DESCRIPTIONS OF BRITISH TAXA

68.5 *S. apocarpum* (Hedw.) Bruch & Schimp.

Dull green to brownish tufts, patches or rough mats, shoots 0.5-5.0(-8.0) cm long. Leaves straight to subfalcate, ovate to narrowly lanceolate, acute, margins entire or sparsely and bluntly toothed near apex; hyaline points usually present, (0-)0.05-0.50(-1.20) mm long, entire to spinulose-denticulate, decurrent down margins or not; costa smooth or with sparse low papillae on abaxial side above; basal marginal cells shortly rectangular to wider than long, with \pm uniformly thickened walls, cells above incrassate, usually sinuose, smooth, 8-10 μm wide in mid-leaf. Perichaetial leaves lingulate-lanceolate to ovate. Capsules obloid, 1.2-1.6(-2.0) times as long as

wide; exothelial cells \pm isodiametric to wider than long in lower half of capsule; spores 11-15(-19) μm . On exposed basic rocks, walls, mortar, concrete, in a wide range of habitats, very rarely on trees. 0-1210 m. Frequent or common throughout the British Isles.

The leaves of *S. apocarpum* are often slightly curved to subfalcate. *S. crassipilum*, which sometimes has bluntly toothed leaf margins and/or low papillae on the abaxial side of the costa, and *S. elegantulum* differ in the shortly rectangular exothelial cells, smaller spores and basal marginal cells with strongly thickened transverse walls.

68.6 *S. trichodon* (Brid.) Poelt

Black straggling patches or tufts, shoots to 8 cm long, leafless below. Leaves ovate-lanceolate, acuminate, margins irregularly bluntly toothed towards apex at least in some leaves; hyaline points 0-80 μm long, spinulose, decurrent down margins; costa smooth or with low papillae on abaxial side above; basal marginal cells quadrate or wider than long, walls \pm uniformly thickened, cells above incrassate, sinuose, smooth, in mid-leaf 8-10 μm wide. Capsules obloid, 1.4-2.1 times as long as wide; exothelial cells \pm isodiametric to shortly rectangular in lower half of capsule; peristome teeth incurved with tips overlapping when dry; spores 10-14 μm . Exposed calcareous rocks. 10-1100 m. Rare in western and northern Britain.

The tips of the peristome teeth overlapping when dry is a feature unique to *S. trichodon*. In the absence of suitable capsules it differs from *S. apocarpum* in its black colour, and the very short or absent hyaline points of the leaves which are acuminate rather than acute as in *S. apocarpum*.

68.7 *S. papillosum* Culm.

Lax or dense tufts or patches, reddish above, olivaceous below. Shoots to 10 cm long. Leaves straight to subfalcate, lanceolate to ovate, acute to acuminate, margins papillose-denticulate above; hyaline points 0-0.50(-1.25) mm but often short, slightly to strongly spinulose-denticulate at least below, shortly to longly decurrent down margins; costa strongly papillose on abaxial side, papillae to 10 μm high; basal marginal cells quadrate to wider than long, walls \pm uniformly thickened, cells above incrassate, sinuose, strongly papillose on both sides, 8-10 μm wide in mid-leaf. Capsules obloid, 1.5-2.0 times as long as wide; exothelial cells quadrate to wider than long in lower half of capsule; spores 10-13 μm . On basic to acidic sheltered to exposed montane rocks. To 1210 m. Rare.

Much rarer than *S. strictum* from which it differs in the leaf cells strongly papillose on both sides and longer capsules.

68.8 *S. pruinosum* (Wilson ex Schimp.) Roth

Olivaceous or brownish, dense, frequently grit-filled tufts, often somewhat hoary when dry. Shoots 1.5-3.0(-4.5) cm long. Leaves straight, lanceolate to ovate, acute to obtuse, opaque above, margins papillose above; hyaline points to 1.6 mm long, smooth to spinulose below, decurrent down margins or not; costa papillose above on abaxial side; basal marginal cells quadrate to wider than long, walls \pm uniformly thickened, cells above sinuose or not, coarsely papillose on both sides, 6-8 μm wide in mid-leaf, opaque in upper part of leaf. Capsules obloid, 1.3-2.0 times as long as wide; exothelial cells isodiametric to wider than long in lower half of capsule; spores 10-14(-15) μm . On dry or seasonally moist, usually exposed calcareous rocks and cliffs. 400-850 m. Rare.

The coarsely papillose cells, 6-8 μm wide in mid-leaf are diagnostic.

68.9 *S. strictum* (Turner) Loeske ex Mårtensson

Dull red to rust-coloured dense tufts to straggling patches. Shoots to 10(-12) cm long; stems often with several dwarf branches above. Leaves straight or slightly curved, from ovate or lanceolate basal part narrowed then tapered to acute or acuminate apex, margins papillose-denticulate towards apex; hyaline points 0-350(-600) μm long, not or hardly decurrent down margins, sparsely spinulose; costa papillose on abaxial side with papillae to 5 μm high; basal marginal cells quadrate or wider than long, walls \pm uniformly thickened, cells above incrassate, esinuose to strongly sinuose, with scattered low papillae on abaxial side, 8-10 μm wide in mid-leaf. Capsules spherical to obovoid, 1.1-1.4 times as long as wide; exothelial cells mostly wider than long in lower half of capsule; spores 12-15(-18) μm . On exposed, dry, basic montane cliff ledges and rocks, rarely in lowland ravines and on sea-cliffs. 0-1000 m. Rare in Wales, northern England and southern Scotland, frequent in parts of the Scottish Highlands.

The leaves of *S. strictum* differ slightly in shape from those of other species. They are narrowed then tapered above the widest part; in other species the leaves taper from the widest part to the apex. The low cell papillae of *S. strictum* are difficult to detect but the colour, leaf shape, papillose-denticulate margins and papillose costae will identify this plant.

68.10 *S. dupretii* (Thér.) W.A. Weber

Small brown or more rarely olivaceous tufts, to 1.5 cm high. Leaves lanceolate to ovate-lanceolate, obtuse to acute, margins entire; hyaline points very short but rarely absent, 0-150 μm long, narrow, spinulose; costa smooth on abaxial side; basal marginal cells quadrate or wider than long, walls \pm uniformly thickened, cells above incrassate, sinuose or not, smooth, mostly 8-10 μm wide in mid-leaf. Perichaetial leaves narrow, ligulate-lanceolate, longly overtopping capsules. Capsules shortly cylindrical, 1.4-2.0 times as long as wide; exothelial cells variable in shape in lower half of capsule; spores 8-10 μm . On exposed or partially shaded, dry calcareous rocks. Apparently very rare.

The small size may lead to confusion with *S. confertum* or *S. frigidum* var. *havaasii* but *S. dupretii* differs in the basal marginal cells of the leaves having walls of \pm uniform thickness.

68.11 *S. robustum* (Nees & Hornsch.) Blom

Dull green to light brown or rusty red, somewhat hoary tufts or patches; shoots 1-3(-5) cm long. Leaves straight, lanceolate to ovate-lanceolate, acute, margins entire; hyaline points coarse, flattened below, terete above, (0.2-)0.4-1.6 μm long, strongly spinulose, decurrent down margins; costa smooth on abaxial side above; cell walls yellowish, basal marginal cells quadrate or wider than long, cells above incrassate, strongly sinuose, smooth, 8-12 μm wide in mid-leaf. Capsules shortly cylindrical, 1.8-2.3 times as long as wide; exothelial cells variable in size and shape in lower half of capsule; spores 8-12 μm . On exposed limestone and basic rocks and cliff ledges. 0-750 m. Rare to occasional in northern Britain.

S. robustum is readily recognised by the long coarsely spinulose hyaline points to the leaves and thick-walled strongly sinuose leaf cells.

68.12 *S. confertum* (Funck) Bruch & Schimp.

Small, tight, often grit-filled, dark green cushions, to 1.5 cm high. Leaves straight, narrowly

lanceolate to ovate, acute, margins entire; hyaline points flattened, spinulose-denticulate, 0-200 μm long, not decurrent down margins; costa smooth on abaxial side above; basal cells 20-40 μm long, basal marginal cells \pm hyaline, quadrate to shortly rectangular with transverse walls more strongly thickened than longitudinal walls, cells above thin-walled to incrassate, not or hardly sinuose, 6-8 μm wide in mid-leaf. Perichaetial leaves not plicate. Capsules cup-shaped, 1.1-1.3 times as long as wide; exothelial cells mostly shortly rectangular; peristome teeth orange-red, strongly perforated; spores 8-10(-11) μm . On exposed basic rocks. Rare.

68.13 *S. flaccidum* (De Not.) Ochyra

Dense, sometimes hoary, olive-green cushions, blackish below, 0.5-1.8 cm high. Leaves narrowly lanceolate to ovate, margins entire; hyaline points 150-850 μm long, flattened, not or hardly decurrent down margins, denticulate; costa smooth on abaxial side; basal cells 34-67 μm long, basal marginal cells quadrate with strongly thickened transverse walls, cells above thick-walled, not or slightly sinuose, 7-9(-10) μm wide in mid-leaf. Perichaetial leaves plicate. Capsules \pm spherical to obovoid, cup-shaped when empty, 0.9-1.3 times as long as wide; exothelial cells irregularly shaped in upper part of capsule, rectangular below; peristome teeth rudimentary, not or scarcely extending beyond bright red capsule mouth; spores 8-10 μm . On exposed, base-rich rock faces. Caernarfon.

Differing from other *Schistidium* species in the apparently gymnostomous red-mouthed capsules and plicate perichaetial leaves.

68.14 *S. frigidum* Blom

Small, dense, olive-green cushions or sometimes extensive tufts; shoots to 2 cm long. Leaves linear-lanceolate to lanceolate, acute to acuminate, margins entire; hyaline points 0-200 μm long, not decurrent down margins, flattened, spinulose; costa smooth on abaxial side; basal cells 40-75 μm long, basal marginal cells rectangular, hyaline, with very strongly thickened transverse walls, often forming a distinct marginal row, cells above incrassate, sinuose, smooth, 6-10 μm wide in mid-leaf. Perichaetial leaves not plicate. Capsules cup-shaped to shortly cylindrical; exothelial cells variable in shape in lower half of capsule; spores 10-13(-17) μm .

For the characters of var. *frigidum* and var. *havaasii* Blom see key.

In *S. frigidum* the basal marginal cells are rectangular, usually hyaline and with very strongly thickened transverse walls – these walls may sometimes be so strongly thickened as to appear quadrate – and often form a distinct border at the base of the leaves. This border and the irregularly shaped exothelial cells will distinguish *S. frigidum* from *S. crassipilum* and *S. elegantulum*.

68.15 *S. atrofusum* (Schimp.) Limpr.

Tight, blackish, readily disintegrating, often grit-filled tufts or cushions, 1-3 cm high. Leaves brown, opaque above, lanceolate to broadly lanceolate, subacute to obtuse, margins entire; hyaline points usually absent but occasionally present and up to 60 μm long; costa percurrent, smooth on abaxial side; basal marginal cells quadrate to wider than long, transverse walls more strongly thickened than longitudinal walls, cells above moderately thickened, not or slightly sinuose, smooth, 8-10 μm wide in mid-leaf. Capsules deeply immersed, obloid, 1.3-1.7 times as long as wide; exothelial cells variable in shape in lower half of capsule; spores *ca* 10 μm . On dry,

strongly calcareous boulders. 550-650 m. Very rare.

Readily recognised by the blackish, readily disintegrating cushions, the brown leaves and the deeply immersed capsules.

68.16 *S. crassipilum* Blom

Dark olive-green tufts or patches; shoots 1-3 cm long. Leaves lanceolate to ovate, acute, margins sometimes papillose-denticulate or bluntly toothed above; hyaline points 0-1 mm long, coarse, spinulose-denticulate, flattened towards base, usually decurrent down margins; costa smooth or with scattered low papillae on abaxial side; basal cells often noticeably wider than cells immediately above, basal marginal cells shortly rectangular to wider than long, transverse walls more strongly thickened than longitudinal walls, cells above moderately thickened to incrassate, smooth, not or slightly sinuose, 8-10(-12) μm wide in mid-leaf. Capsules obloid or shortly cylindrical, 1.5-2.0 times as long as wide; exothelial cells shortly rectangular in lower half of capsule; spores (6-)9-11(-12) μm . Exposed or sheltered, dry, base-rich rocks, cliff ledges, limestone pavement, walls, buildings. Probably common, especially in lowland areas.

Distinguished from *S. elegantulum* by the more shortly tapered leaves with margins often toothed or papillose-denticulate towards the apex and the hyaline points flattened below and usually decurrent down the margins.

68.17 *S. elegantulum* Blom

Olivaceous mats or tufts; shoots often slightly hoary when dry, 1.5-3.0 cm long. Leaves straight or slightly curved, linear-lanceolate to lanceolate, acuminate, margins entire; hyaline points to 1 mm long, terete, not flattened below, spinulose, not decurrent down margins; costa smooth on abaxial side above; basal marginal cells rectangular to wider than long, with thickened transverse walls, cells above incrassate, not or hardly sinuose, 8-10 μm wide in mid-leaf. Capsules obloid or shortly cylindrical, 1.6-2.5 times as long as wide; exothelial cells mostly shortly rectangular in lower half of capsule; spores 8-10(-12) μm .

For the characters of ssp. *elegantulum* and ssp. *wilsonii* Blom see key.

In ssp. *wilsonii* the costa is conspicuously stout and the spinulae of the hyaline points are very small, barely detectable under the low power of the microscope. *S. elegantulum* may be recognised in the field by the slightly hoary, lax to dense tufts with narrowly pointed leaves.

VICE-COUNTY RECORDS

Listed below are vice-counties from which I have seen specimens. It must be stressed that these records are very incomplete for *S. apocarpum*, *S. crassipilum* and *S. elegantulum*, and there are also likely to be many more records of the other species. For species not listed here, see the most recent edition of the *Census Catalogue* (Blockeel & Long, 1998). Records in brackets are pre-1950.

***S. apocarpum*:** 1-3, 6, 9, 27, 28, (33), 34, (35), 39, (40), 41-45, 47-50, 53, (55, 57), 58, 65, 72, (77), 78, 82, (83-85), 87-90, 92, 94, 96-99, (100, 101), 102, (103), 104, 106-108, (110, 111). H3, 9, 16.

S. papillosum: 42, 72, 88-90, 92.
S. pruinatum: 83, (85, 87, 88), 90, 92, 97, 98, 103. H(39).
S. dupretii: (83), 87.
S. confertum: 28, 43, 47, 48, (49), 64, 77, (83, 85, 87-88), 90, 107, 108. H(38, 39).
S. frigidum var. *frigidum*: 42, 47, (49, 65), 72, 89, 92, 96, 97, 104.
S. frigidum var. *havaasii*: 49, 72, 88.
S. crassipilum: 1, 4, 6, 12, 17, 27-29, 34, (35), 41, 45, (49), 57, 64, 67, (82, 83, 85), 86-88, (89, 90), 105-107. H26, 28, (39, 40).
S. elegantulum ssp. *elegantulum*: (34), 52, 89, 108.
S. elegantulum ssp. *wilsonii*: 36. H9.

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STUDY TOUR TO PETITE-SUISSE, LUXEMBOURG, MAY 1999

NICK HODGETTS¹, ANDY JACKSON² & RON PORLEY³

¹Joint Nature Conservation Committee, Monkstone House, City Road, Peterborough, PE1 1JY

²Royal Botanic Gardens, Wakehurst Place, Ardingly, nr Haywards Heath, West Sussex, RH17 6TN

³English Nature, Foxhold House, Crookham Common, Thatcham, Berkshire, RG19 8EL

This note describes a short study tour made by members of the Working Group for the Conservation of Cryptogams in the Weald to the sandstone exposures of the Petite-Suisse (or Müllerthal) in Luxembourg. The visit was organised by Andy Jackson of Kew Gardens (Wakehurst Place) at the invitation of the Luxembourg bryologist Jean Werner, with the aims of a) comparing the Weald sandrocks with those of the Petite-Suisse (thus placing them more effectively in an international context), and b) sharing ideas on the conservation of these interesting sandstone areas. Jean, who is also the President of the Group d'Etudes ayant pour objet la Conservation du Patrimoine Naturel de la Petite-Suisse Luxembourgeoise (a committee set up to promote nature conservation in the Petite-Suisse), was joined during the visit by Guy Colling, Jean-Marie Sinner (both from the Service Conservation de la Nature), Jean-Jacques Erasmy (Administration des Eaux et Forêts), Florian Hans and Yves Krippel (both scientific collaborators of the Musée d'Histoire Naturelle). As well as Andy, the British contingent consisted of Jeff Duckett (Queen Mary & Westfield College, University of London), David Hardman (Kew Gardens), Nick Hodgetts (Joint Nature Conservation Committee), Howard Matcham, Ron Porley (English Nature) and Rod Stern. Sadly the other member, Rendel Williams, a geologist from

Sussex University, had to withdraw at the last minute due to ill health. Our base for the visit was Echternach, the ‘capital’ of the Petite-Suisse, a pretty town on the banks of the Sûre.

Saturday 1 May

The first day was spent largely in the car and on the ferry. We were in two cars, and elected not to attempt to travel in convoy on the French and Belgian autoroutes, arranging to meet for lunch at a service area. One of the cars (we won’t say who was navigating!) went slightly astray, but we met up later near Esch-sur-Sûre in northern Luxembourg, when the occupants of the Kew car spotted four characters who could only be bryologists examining a roadside rock face. As Andy put it, we looked ‘incongruous in the landscape’. We made a short bryological examination of the slatey roadside rocks, which yielded little but luxuriant *Lophozia excisa* with perianths, *Bartramia pomiformis*, and other common calcifuge species. Perhaps the most interesting find was *Cynodontium bruntonii* with protonemal gemmae, the first time they have been observed in this species. The roadside sycamores were coated with *Radula complanata*, *Frullania dilatata*, *Ulotrichum bruchii* and, especially, an *Orthotrichum* which looked ‘pale and interesting’ in the field, but proved to be nothing more than *O. affine* when examined later. Spring was rather late in this part of the Ardennes, with a relatively high altitude of ca 480 m above sea level, and the blackthorns were still in flower. Moving on a few hundred yards, the slatey rocks on both sides of the road tunnel to Esch, by the River Sûre, proved to be quite interesting, with abundant *Grimmia trichophylla* and *Frullania dilatata*. Luxuriant *Homalothecium* provoked some discussion, as we hoped to find some non-British species, but it was a mixture of *H. lutescens* and *H. sericeum* growing where the rocks were flushed with base-rich water. A nice little colony of Forked Spleenwort *Asplenium septentrionale* was a bonus in the crevices of a road cutting by the Sûre.

Nearing Echternach, we stopped in a narrow wooded valley south-east of Dillingen for our first experience of the Petite-Suisse itself. Bryophytes here were lush around a small stream in the beech forest, and included *Bazzania flaccida*. Time was by now getting on, so we completed the drive to the Hotel Commerce in Echternach and spent the evening sampling the local hospitality, which included excellent Luxembourg white wine made from grapes grown in the Moselle valley and a very good blues band in one of the pubs.

Sunday 2 May

The ‘official’ part of the trip was not scheduled to begin until Monday, so we spent Sunday exploring, at Jean’s suggestion, the Buntsandstein area of Germany, just over the Moselle north of Trier, near the town of Kordel, where Jean had recorded previously and found some interesting species (Werner, 1992). This is a picturesque sandstone area, effectively an eastward extension of the Petite-Suisse, with many mainly acidic sandstone exposures in an extensive beech and spruce forest that is well utilised for leisure activities such as hiking, cycling, camping, etc. The morning was spent on sandstone crags deep in the forest at Genovewahöhle, where there was a good development of the sandstone rock flora, including sheets of *Calypogeia integristipula* and *Odontoschisma denudatum*, and luxuriant *Bazzania trilobata*. *Calypogeia azurea*, *Harpanthus scutatus*, *Tritomaria exsectiformis* and *Tetradontium brownianum* were also found. We spent a long time puzzling over a small leafy hepatic that in the end turned out to be *Lophozia collaris* (or *Leiocolea alpestris*, as we call it in Britain). The moss flora consisted mainly of common calcifuge species, including *Paraleucobryum longifolium*, frequent on rocks in forest in this part

of the world but a rarity in Britain, where it is confined to block scree in the central and eastern Scottish Highlands. Although the bryophytes were interesting, it was not outstandingly rich, and we noticed that the rock was rather hard compared to that of the Weald. Only two cushions of the alien *Orthodontium lineare*, an abundant moss on the Weald sandstone, were found. Hearing and, for the occupants of one of the cars, seeing a black woodpecker was a spectacular bonus.

Back on a minor road, we found an exposure of sandstone that was rather softer and wetter, where the main interest was an extensive growth of *Jungermannia leiantha*, producing perianths and capsules copiously. Just over the road, elders and willows by the river gave us the usual suite of common epiphytes (*Orthotrichum affine*, *Ulota bruchii*, *Frullania dilatata*, etc.) together with *Pylaisia polyantha*, another common plant in the area which is scarce in Britain, and *Orthotrichum obtusifolium*, a great rarity in Britain but common in continental Europe.

Intending to have a quick sandwich, we installed ourselves at a table in the sun outside a nearby country inn, where our inadequate collective grasp of German led us inadvertently to tuck into large platefuls of pork and salad, washed down with beer or orange juice. Thus incapacitated, we forced ourselves to move on. A walk to a small waterfall just below our lunch spot was obviously popular with daytrippers, but not very inspiring bryologically. Most of the crags here were south-facing and only the more common species were seen. One crag on the opposite side was wetter and more sheltered, and this had more *Jungermannia leiantha* growing on it. On returning to the cars we decided to look for some more sandstone exposures deeper in the forest. This led to an abortive and, as it turned out, illegal drive along forest tracks under the censorious gaze of the passing German walkers and cyclists for whom the tracks were supposed to be reserved. Feeling slightly self-conscious, we retreated north of Kordel and had a brief look at a roadside waterfall, which was cutting through more calcareous rock and forming tufa. A small moss with capsules here caused some excitement as possible *Gyroweisia reflexa*, but in the end it turned out to be *G. tenuis*.

As time was marching on, and sensing that we had probably started at the best site, we decided to round off the afternoon with a visit to Trier, with its spectacular Roman buildings and more recent baroque architecture.

Monday 3 May

The British team met up with our colleagues from Luxembourg, led by Jean Werner, at the church in Berdorf first thing in the morning. We immediately drove on to look at the spectacular zigzag sandstone gorge (appropriately named the Zickzackschloeff) nearby. After perusing it briefly from above, when we were warned of the danger of the colossal cliffs (which apparently cause death or injury fairly regularly, especially in wet weather), we descended through locked iron gates into the stygian gloom of the zigzag, a very deep, narrow passageway in the sandstone and the home of one of the very few Luxembourg populations of Tunbridge Filmy-fern *Hymenophyllum tunbrigense*. Many of the interesting bryophytes of this site have apparently disappeared because of tourist and rock climbing pressure, so a short section of the gorge itself was accessible only with a key to the gate. The bryophytes, and the filmy fern, were consequently recolonising some of the formerly scoured surfaces - an encouraging sight, although many were still very depauperate. However, it seems that *Plagiochila spinulosa* and *P. killarniensis* may have disappeared for ever. Jeff caused much excitement by finding the minute lichen *Mniacea*

jungermannioides growing on *Cephalozia*, new to Luxembourg.

After this ‘flying visit’, we were taken back to Echternach for a meeting in the historic town hall to discuss conservation issues and to exchange scientific and interpretive literature. Jean explained that measures to protect the Zickzackschloeff were taken only after much persuasion of the local authorities by himself and colleagues. However, these measures were in direct response to the damage being done to the bryophytes and ferns. Andy explained the responsibility of Kew Gardens in managing some of the Weald sandrocks, and Ron talked about the English Nature perspective. We were then honoured by a ‘champagne’ reception of local wine given by the mayor before being led to a nearby hotel where we were treated to a really splendid lunch by the Service Conservation de la Nature, Administration des Eaux et Forêts, the government department responsible for conservation in this area.

The afternoon was spent walking up the Halerbaach near Beaufort, a picturesque wooded valley flanked by large sandstone cliffs. The flora here was quite rich and included some uncommon species on the sandstone, including *Anastrophyllum hellerianum*, *A. minutum*, *Bazzania flaccida* (as well as *B. trilobata*), *Harpanthus scutatus* (with more *Mniacea jungermannioides* growing on it!), *Jamesoniella autumnalis*, *Jungermannia leiantha*, *Scapania umbrosa*, *Tritomaria exsecta*, *Dicranum fulvum* and *Eurhynchium angustirete*. Florian found *Sematophyllum demissum*, a new site for this species, and Ron subsequently found another colony further up the valley. *Leptobarbula berica* was also found (growing on a sandstone boulder and producing abundant capsules), a new plant for the Petite-Suisse.

Tuesday 4 May

The first site for the morning was the acidic and swampy forest of Dillingerknaeppchen, Birkbaach, where a stream wound its way through spruce, pine and beech. The spruce is apparently not native to the area, although some of the plantations looked very natural. Pine is almost certainly native to Luxembourg, but the position is confused by the extensive planting that has taken place. This is one of the few sites in the Petite-Suisse for *Scapania undulata*, which grew in some abundance on stones in the stream, and also for *Hookeria lucens*. However, the locally common *Dicranum fulvum* was of more interest to British bryologists! Several common species of *Sphagnum* were frequent, and *Riccardia latifrons* (producing abundant capsules) grew on wet, rotting wood in the stream along with *Calypogeia azurea*. Fruiting *Herzogiella seligeri* (described as ‘a weed’) was found on a pine stump, and *Paraleucobryum longifolium* was again frequent.

We were whisked away from Birkbaach to a completely contrasting site down the valley at Aesbaach, where beech was again dominant but forming more open woodland on calcareous marl, with calcareous sandstone boulders scattered on the slopes and in the stream. The bryophyte flora reflected the calcareous substrate, and species such as *Anomodon viticulosus* and *Thamnobryum alopecurum* were common. *Tortella tortuosa* and *Gymnostomum calcareum* were frequent on the calcareous sandstone rocks. The commonest liverworts were *Plagiochila porelloides* and *Jungermannia leiantha*. *Jungermannia atrovirens* and *Tortella bambergerei* were also collected. This latter species is not universally recognised, but can be distinguished from *T. tortuosa* by the scabrous dorsal surface of the nerve and the presence of a central strand in the stem. Most excitingly, Jeff and Jean found *Dichodontium flavescens* (with capsules), new to

Luxembourg, growing on a boulder in the stream (Werner, 1999).

After yet another substantial lunch, this time provided by the Director of Luxembourg's Musée National d'Histoire Naturelle, at a country inn with a very English feel to it, we continued on to our final venue, Schnellert, Melerbur, an area of open, dry beechwood with outcrops of calcareous sandstone. Although the bryophyte flora here was not luxuriant, there were some interesting species, notably *Jamesoniella autumnalis*, *Scapania aspera*, *Anomodon longifolius*, *Dicranodontium denudatum*, *Eurhynchium angustirete*, *E. schleicheri* and *Heterocladium heteropterum* var. *flaccidum*, the latter new to Luxembourg. Here we took our leave of our Luxembourg colleagues and drove west, having booked into a hotel in north-eastern France for the night in order to shorten the journey back the following day.

We were hoping to stop to examine any interesting-looking areas *en route*, but there was not much to divert our attention from the road until we had nearly arrived at our destination, where we had a good view of a goshawk as it disappeared into the forest. Stopping to look around, we immediately found a lovely clump of Whorled Solomon's-seal *Polygonatum verticillatum*, moments after Howard had coincidentally commented that he would like to see it! Soon afterwards we arrived at the little town of Haybes-sur-Marne, which nestled in the valley entirely surrounded by forest, a novel and almost primæval experience for British people. Our hotel was modestly priced and of excellent quality; at dinner, there was only a limited number of portions of chicken stuffed with snails available, but Andy nobly declined so that Ron could partake. We explored the banks of the Marne briefly the following morning but there was nothing of bryological interest except *Cinclidotus fontinaloides*, although we would prefer to have found *C. danubicus* or *C. riparius*! The rest of the day was simply a drive from Haybes to the ferry, which culminated in a fairly thorough search of one of the cars at customs - perhaps because all four occupants were heavily bearded and therefore rather sinister-looking; but eyelids remained unbatted at the suspicious-looking packets of dry moss, somewhat to our surprise.

It had been an extremely useful and enjoyable trip, both for experiencing the sandrocks of Luxembourg's Petite-Suisse at first hand and for making contact with colleagues involved in their conservation. There were several striking comparisons to be made with the Sussex sandrocks. In general, they were much more extensive and spectacular, with larger exposures and deeper, darker valleys and gulleys than in Sussex. The climate in Luxembourg is more continental than in the Weald (it is outside the range of bluebells, for example), so the survival of the oceanic and sub-oceanic bryophytes there is almost certainly more dependent on the more extreme geological and topographical features. There is also perhaps more variety of base-status on the Petite-Suisse sandrocks, ranging from very acidic to notably base-rich. Other geological and geomorphological similarities and differences require further investigation and it is hoped that Rendel Williams will be able to examine these in the future.

Although the bryophyte flora of the Petite-Suisse certainly had a lot in common with that of the Weald, there were also notable differences. As on the Weald sandrocks, there was much *Tetraphis pellucida*, *Calypogeia integristipula* and *Odontoschisma denudatum*. The introduced moss *Orthodontium lineare* was rare (indeed, the only time we saw it was in Germany!) and apparently non-invasive, unlike in the Weald, where it can form vast swathes on the rocks; the much rarer *O. gracile*, one of the special plants of the Weald, was apparently absent. *Jungermannia leiantha*, a rare and declining plant in Britain, not seen in the Weald since

Nicholson's record of 1910, was one of the most common liverworts in the Petite-Suisse, but *Pallavicinia lyellii*, another Weald speciality, was absent. *Blepharostoma trichophyllum* seemed to be relatively much more abundant in the Petite-Suisse than in the Weald. And why should *Paraleucobryum longifolium* be common in the Petite-Suisse when in Britain it is confined to a few montane parts of Scotland? Similar questions could be asked about *Sematophyllum demissum*, confined in Britain to south-west Ireland and west Wales, or *Dicranum fulvum*, apparently absent from Britain and Ireland altogether, or *Geocalyx graveolens*, not seen during this trip, but present in the Petite-Suisse. *Hymenophyllum tunbrigense* was here confined to the deepest, darkest gorges (and often looking very stunted!), whereas it is slightly less demanding in the more oceanic climate of the Weald.

The occurrence of other species in the Petite-Suisse may simply be a result of differences in perception between British and continental bryologists. *Tortella bambergeri*, for example, may well occur in Britain (but probably not in the Weald, where a strongly calcicolous element in the flora is missing) but has been disregarded by British bryologists, as it has been seen as synonymous with *T. tortuosa*. A couple of notable records from a Luxembourg point of view were made during the visit. *Dichodontium flavescens* was new to Luxembourg and *Leptobarbula berica* was new to the Petite-Suisse, growing on calcareous sandstone and thus recalling its occurrence on the lower greensand in Sussex.

From a conservation perspective, it was encouraging to see that the value of the Petite-Suisse as a natural resource is now being recognised by the Luxembourg authorities, thanks in no small measure to the efforts of Jean Werner and his colleagues. This has not been an easy process; until very recently, nature conservation has been run from within the Administration des Eaux et Forêts and conservation objectives have therefore inevitably been secondary to forestry objectives. However, the conservation arm is now separate and consequently has much more influence. The Petite-Suisse is heavily utilised by tourists from Belgium, Germany and Holland and the Luxembourgers themselves, and needs careful management if the plants and wildlife are to survive. Initiatives such as the gating off of the Zigzagschloeff will contribute to this. The Weald, by contrast, is to a large extent a 'secret landscape', with much less overt tourist pressure at all but a few sites. The Administration des Eaux et Forêts has produced some attractive literature (in French, German and Dutch) to draw public attention to the natural riches of the area (which could provide some useful ideas for the Working Group), and many areas now receive some measure of statutory protection. Forest management is largely under state control in Luxembourg, and this makes it relatively easy to implement effective conservation management over important areas. On the other hand, the situation is rather less straightforward in the Weald, where there is a complex mosaic of ownership, both public and private.

To further our understanding of the conservation of European sandstone areas there was discussion between ourselves and the Luxembourg team of the need to visit the sandrocks known as the Elbsandsteingebirge on the German-Czech border. Andy Jackson would be interested to hear from anyone who has visited this locality or has knowledge of other areas of sandstone in Europe that are noteworthy for their cryptogams. Andy would also appreciate any comments on the value of holding a conservation workshop near the Elbsandsteingebirge, perhaps linked to the next ECCB (European Committee for the Conservation of Bryophytes) conference to be held in the Czech Republic in 2001. He can be contacted at the Royal Botanic Gardens, Wakehurst Place (address above); tel: 0181 3325054; e-mail: A.Jackson@rbgkew.org.uk.

It is clear that these sandstone areas, so scarce in Europe as a whole, are of great importance for bryophytes (and ferns and lichens). While having much in common with one another, each area also has its own special character, and each is therefore unique and worthy of conservation. It is unfortunate that they are not listed on Annex I of the EC Habitats Directive and so cannot be protected by the designation of Special Areas of Conservation (SACs).

Finally, our grateful thanks to Jean Werner and his colleagues for organising such an enjoyable and useful meeting. Thanks are also due to Jeff for providing a vehicle and doing much of the driving.

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TROPICAL BRYOLOGY GROUP: VISIT TO UGANDA, 1998

HOWARD MATCHAM

21 Temple Bar, Strettington, Chichester, West Sussex, PO18 0LB

Four members of the Tropical Bryology Group left for the final field trip to Uganda on 29 June 1998. We had planned to visit the Rwenzori mountain range but political instability meant this was impossible. The purpose of this visit was therefore to record bryophytes from montane forest on the slopes of Mt Elgon and, if time allowed, to record from within the caldera at the summit of the mountain. Those taking part were Ron Porley (leader), Catherine LaFarge, Jeff Duckett and, at short notice, Howard Matcham, deputising for Nick Hodgetts who had to withdraw. The visit lasted for 23 days. As in the previous visits, our initial base was at Makerere University campus in Kampala where we were to pick up two vehicles, collect permits from the Science Ministry for those on their first collecting trip, and arrange for maps of Mt Elgon and the necessary entrance permits from the National Parks Office. This took longer than we had anticipated as apparently faxes from the UK had either gone 'missing' or had simply not arrived. Eventually the paperwork was complete but a day had been lost in the process.

As it was intended to spend as much time as possible on the mountain, a great deal of thought had to be given to the logistics of the expedition - the amount of food and water needed to sustain the four of us, and how to carry it up the mountain. This all had to be purchased in Kampala as our next stop was to be the town of Mbale, 250 km from Kampala, where it may not have been possible to buy the amount required. We eventually left the university campus on 2 July, driving a Land Rover and a four-wheel drive Suzuki, both exceedingly well maintained by Bob Lyazi and

his staff. The drive to Mbale took us over the spectacular Owen Falls Dam, formerly a cataract on the Victoria Nile just below Lake Victoria. The dam was completed in 1954 and provides hydroelectric power for much of Uganda and Kenya; it is also used to control flood waters.

On arrival at Mbale we booked into the Mt Elgon hotel; two nights were spent here while we arranged to hire porters and guides. Mbale is about 50 km from Mt Elgon. There are two routes up the mountain; the Sasa trail which approaches from the west, and the Piswa trail from the north. We chose to follow the latter trail which, although the longer of the two routes, is less well known from a botanical point of view.

Having settled into the hotel, our next appointment was with staff from the Mt Elgon Conservation and Development Project who enthusiastically informed us that they had no knowledge of our impending arrival and that we must return to Kampala in order to obtain a letter with the appropriate official stamp on it which would enable us to gain entry into the National Park. This would have meant a loss of a further three days – the trip was fast becoming a bureaucratic nightmare. Fortunately, diplomacy triumphed, and we were now entitled to stay on Mt Elgon for a month. Officially!

We were informed by the Development Project staff that guides and porters are not park employees and have to be hired from a co-operative called the Mt Elgon Guides and Porters Association. They are trained by park rangers and are knowledgeable and reliable. As we had chosen the Piswa trail, the guides and porters were to be hired at the village of Kapchowa some 60 km from Mbale. We decided to buy our remaining stores, kerosene, tilly lamps etc. the following day, and then drive to Kapchowa and arrange for porters and guides to accompany us on our trek up the mountain. The road to Kapchowa was very badly maintained, and we were relieved to arrive without vehicle damage. Unfortunately, on arrival, we found that we had been misinformed; guides and porters were not available at Kapchowa but needed to be hired at the base camp at Kapkwata, some 30 km further on - too far to continue that day and return to Mbale before dark.

We made an early start the following morning, 4 July, leaving behind at the hotel all non-essential clothing, cases etc. After a seven-hour drive we arrived at Kapkwata Forest Station, heavy rain having made driving conditions for the final 20 km very difficult indeed. At Kapkwata we were met by staff from the American Peace Corps, who are managing the National Park for and on behalf of the Mt Elgon Conservation and Development Project. Here we were provided with porters to carry all our food and equipment, a guide and an armed ranger. Six days after leaving the UK we were on our way!

The following day was spent trekking the 11 km up to the Piswa camp at 2850 m. This first stage took us through open country grazed by sheep and cattle, up into *Podocarpus*-dominated forest with rock outcrops on which *Grimmia laevigata* and *G. longirostris* were prominent. The final stages of the steep ascent to Piswa took us through *Olea africana* afro-montane forest, inhabited by Blue monkeys and the spectacular Black and White Colobus monkeys. These forests support a very different bryophyte flora from that experienced on the previous visits to the western forests of Uganda.

Epiphylls were almost totally lacking, and were only found on three occasions, twice on

Podocarpus and once on the underside of the lichen *Lobaria retigera*. In fact Lejeuneaceae were generally scarce, as were Calymperaceae; *Calymperes*, *Syrrhopodon* and *Octoblepharum* were not seen on Mt Elgon. *Porotrichum* and *Porothamnium* were scarce and pendant species from the genera *Pilotrichella* and *Orthostichopsis* were not seen. However, some genera that were scarce or absent in the western forests were abundant on Mt Elgon, and included *Neckera*, *Cryphaea*, *Prionodon ciliatus* and *Hylocomiopsis cylindricarpa*. *Rhizofabronia perpilosa* was found on the decaying underside of *Olea africana*, the first time that we had seen this genus other than on a tree-fern. The hepatic genera *Frullania*, *Porella* and *Plagiochila* were abundant, and *Hagenia abyssinica* trees had their trunks smothered with an *Herbertus* sp. The African *Herbertus* and *Plagiochila* species are currently being worked on by Nick Hodgetts, who has tentatively named the above as *H. lobatus*.

We spent the day recording in the *Olea africana* forest before deciding to continue up the mountain to make a detailed study of the epiphytes on the two endemic giant groundsel species, *Senecio johnstonii* ssp. *elgonensis* and *S. barbatipes*. The former is found from the upper forest belt, through the ericaceous subalpine belt and up to the lower edge of the Afro-alpine belt (Pócs & Szabó, 1993), while the latter species is dominant between 3800 and 4000 m in the true Afro-alpine belt (Pócs & Szabó, 1993); this was confirmed subsequently by our own observations.

Because of restrictions on camping sites (only two were allowed on the mountain, 16 km apart) and very difficult terrain, it was not possible to walk too far from the Piswa camp site. The opportunity to record from the caldera and ridges below the caldera could only be achieved by continuing up the mountain to the next camping site at Hunter's Caves, at about 3650 m, some 400 m below the rim of the caldera. From here it was possible to record both from the caldera and from lower down the mountain and return before dark.

Three days were spent recording in the caldera and ridges below the caldera and also lower down the mountain at the Hunter's Caves camp site. The moss *Rhytidium rugosum* and the hepatic *Plagiochasma rupestre* were frequent in the caldera, but it was on the rim that the greatest bryophyte diversity was found. *Grimmia apiculata*, *G. obtusolinearis* and *G. trichophylla* are all new to Uganda, and the moss *Claopodium pellucinerve* found by Ron is a genus new to Africa. Another very local species in Africa is *Racomitrium crispipilum*, found on block scree; it was previously known only from Rwanda (Born, Frahm & Pócs, 1993; O'Shea, 1995) and from South Africa (Hodgetts, Matcham & Duckett, 1999).

Both *Senecio* species had a restricted but similar suite of species on trunks and branches which included most of the species recorded by Tamás Pócs and András Szabó in their work on the epiphytic vegetation on the endemic giant groundsel *S. barbatipes* (Pócs & Szabó, 1993). These included *Antitrichia kilimandscharica*, *Leptodontiopsis fragilifolia*, *Neckera submacrocarpa*, *Orthotrichum arborescens*, *Syntrichia cavali* and *Zygodon intermedius*.

The nights were very cold and we awoke to quite severe morning frosts. It also rained frequently and we were pleased to have had porters carrying our equipment with plenty of available warm clothing. The inclement weather made drying our collections difficult. A prior arrangement had been made for porters to carry our collections the 27 km back to base camp at Kapkwata for drying and this was duly undertaken. In the event this was a very sensible precaution and the staff at Kapkwata did a very good job in ensuring that our numerous collections were thoroughly aired.

The final day at Hunter's Caves was very rewarding with superb *Tetraplodon mnioides*. Jeff found what was subsequently identified as *Haplomitrium gibbsiae*, the second record for Africa. It was first found by Jeff in Lesotho (Hodgetts, Matcham & Duckett, 1999) three years previously.

A slow descent to the Piswa camp site allowed us to collect from the ericaceous belt on the way down. An interesting epiphyte was *Zygodon seriatus* with long (eight-celled) gemmae and beautiful orange fenestrations on the basal cells. Many, as yet unidentified, species were collected here. We remained at Piswa for a further four days collecting in various afro-montane forest types: *Hagenia abyssinica* – *Rapanea melanophloea* forest, *Podocarpus* forest and *Olea africana* forest.

Here we split into two groups of two, plus porters and guides, which enabled us to record various forest types by descending and ascending from the Piswa camp. This worked very well and enabled us to cover a much more diverse range of habitats during the time remaining to us on the mountain.

Looking at a very wet cliff in *Olea africana* forest, Jeff and I found an *Asterella* species which has been named by David Long as *A. khasyana*, a well-known Asiatic species (D. Long, pers. comm.) It is only the second record from Africa; the other is from Burundi and was found by David amongst specimens in Jena (D. Long, pers. comm.). Other thalloid hepatics collected on this trip included *Plagiochasma eximium* and *Targionia hypophylla* on an earth bank just outside the park boundary a *Notothylas* sp. (new to Uganda) was found.

The weather by the end of the four days at Piswa was becoming extremely inclement, with very heavy rain. Jeff and I set off back down the mountain to record from steep-sided river banks and boulders in the river before it became too swollen to record safely. Ron and Catherine remained at Piswa camp to record from waterfalls and rock outcrops. We were all successful, with many new records; these included two aquatic *Racomitrium*s, a broad-leaved *Schistidium* and *Cinclidotus fontinaloides*.

Despite mainly cold and wet conditions this was a very successful expedition, made so by all the cheerful help shown to us by the porters, guides and ranger.

Following our final descent from the mountain, one night was spent at Mbale and then one more day travelling back to Makerere University. Two further days were spent at Lake Mburo National Park where we were able to relax in warm weather. The only bryophyte recorded from here was an *Erpodium* sp. However, this was made up for by spectacular birds, which included the Pennant-winged Nightjar, and a brief sighting of a leopard.

The final day at Kampala before flying home late in the evening was a complete nightmare, as we were refused an export permit, although correct procedures had been carried out, which included confirming when we arrived that an export permit would be made available. However, it was not to be and, disheartened that all our hard work might be lost, we had to leave Uganda without our specimens. We were able to leave them at the herbarium in Makerere University and subsequently in January 1999 they were eventually released and arrived back in the UK.

Expedition members are now working through their collections, along with specimens collected

on the other two field expeditions for the project. So far the project as a whole has identified 54 hepatics and 48 mosses new to Uganda (Porley *et al.*, 1999), with only a fraction of the total number of collections identified to species level. Much work remains to be done.

We would like to thank Professor Derek Pomeroy of Makerere University for his sterling efforts over a six-month period negotiating with the relevant authorities for the release of our specimens. We are all immensely grateful.

We would also like to thank Nick Hodgetts and Martin Wigginton for their help in planning this field visit and for supplying maps of Mt Elgon. The expedition was part of a project generously supported by the UK Government's Darwin Initiative.

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TROPICAL BRYOLOGY GROUP: PROGRESS IN 1998-1999

Unfortunately no report was prepared for last year's *Bulletins*, so two years are covered here. Last year's silence was not the result of having nothing to report - rather the reverse: there is now an increasingly large amount of work to do, and indeed being done.

Uganda

The third-year expedition of our Darwin-funded activities in Uganda in summer 1998 was transferred at the last minute to Mt Elgon (see pp. 53-59 of this *Bulletin*): the Ugandan army was fighting rebel troops in the Rwenzoris, our original destination. Although Mt Elgon is already quite well known, the four participants (Ron Porley, Jeff Duckett, Howard Matcham and Catherine LaFarge) made many new records for Uganda. The results so far have already been incorporated in the first three papers in the series 'Bryophytes of Uganda' (published last year in *Tropical Bryology* 16), which reported more than a hundred bryophytes new to Uganda.

Jeff Bates has suggested that the results be published via a book, *Mosses and Liverworts of Uganda*. New York Botanical Garden have expressed an interest in publishing the book. We are

hoping that all collections will be identified at least to family by the end of 2000, to be followed by a two-year period of work by a number of authors to produce the book. It will cover approximately 800 taxa, and authors for all groups have now been appointed. The project will also include the identification of other Ugandan collections (including more than 1200 made by Francis Rose in 1961). Our experience in Malawi has shown that intensive collection can provide a new perspective on the taxonomy of many tropical genera, where there are often many species based on very few collections. Large collections from a comparatively small area can give an indication of variation that has so far been missing, and the resulting taxonomic work may be quite heavy.

Malawi

Publications continue to trickle out via *Journal of Bryology*, but much of the outstanding work either depends on taxonomic work in large and difficult groups, or depends on experts who are already overloaded with other work. However, another paper has been accepted for publication (our 12th) and others are actively being worked on.

Future Expeditions

No arrangements have been made for future trips at present, but three possibilities are being pursued: Kenya, Cameroon and a return trip to Malawi.

TBG Newsletter

Newsletters were published in August 1998 and August 1999 and distributed to 58 members. Publication is now largely via e-mail and the newsletters are all held on the BBS web site. (Membership of the TBG is free and open to all BBS members.)

E.W. Jones' Flora of West African Hepatics

After good progress in producing drawings and revising the text, work ground to a halt when money to complete the illustrations could not be found, including from the BBS. As a result, little work has been done during the past year. Some publication possibilities are still being pursued, but the material may merely be put on the BBS web site in its present state, probably with the addition of some previously published drawings. This is a disappointing end to the work of a world pioneer in African hepaticology, and active BBS member for many years.

Internet

The BBS web page is now up-to-date with all TBG publications and progress reports, and also has a little more information about both the Malawi and Uganda collections. It is planned to make the African moss checklist available on the web as a searchable database. I maintain a constantly updated database covering the distribution of African bryophytes to support the production of a periodically published checklist (the last was produced in November 1999 - see below). These data will now be used to create and update a database at the Royal Botanic Garden, Edinburgh (where the BBS web site is housed), allowing the data to be queried. Although the interface has yet to be designed, it is hoped that it will be possible, for instance, to enter a species name to view

its distribution, or a country name to see a checklist. If successful, we would hope to extend this to cover hepatics.

Lesotho

Although not part of the official TBG activities, several TBG members have been participating in Jeff Duckett's work on the bryoflora of Lesotho and the neighbouring Drakensbergs, and a major paper on the work so far was published in *Journal of Bryology* last year.

Guide to Bryophytes of Sub-Saharan Africa

More than 20 authors, all but one members of the BBS, are participating in a project to produce an illustrated guide to the families and genera of African bryophytes. At the last count, there were 125 families and 498 genera, and around 20% of the accounts are now written. The first draft of all the text should be completed by the summer, and after a period to integrate the individual family accounts and check that the keys work, it is hoped to run three workshops in Africa to check that the guide works in the field, though this will depend on securing funding. The final book will be published by Missouri Botanical Garden in late 2001. We see this as a framework within which future taxonomic work in Africa can be pursued. The project is being managed by Tropical Bryology Research, a company created specifically for the project by myself and Martin Wigginton, and which has its own web site (www.oshea.demon.co.uk/tbr.htm). It has also produced its first publication (see below).

New African Moss Checklist

The original African moss checklist was produced in 1995. Although an update was produced in 1997, this was published only on the BBS web site, which prevented it being referred to as a publication in papers. Like the previous versions, the 1999 version is available as a free downloadable file from the Tropical Bryology Research home page (see previous item), but it has also been published as a paper version: *Tropical Bryology Research Reports* 1. This new serial was seen as a useful way of publishing documents that other journals may not be prepared to publish (the checklist is 135 pages!), but to which authors wish to create free access.

International Botanical Congress, 1999

The International Botanical Congress in 1999 (in St Louis, Missouri) featured seven symposia concerned wholly or in part with bryophytes, and fourteen TBG members were present. Most of the bryological proceedings are to be published in various journals (e.g. *The Bryologist*), or, in the case of the Moss Diversity symposium, as a book.

Alan Eddy

Alan Eddy, who died last year, was perhaps the BBS's premier tropical specialist, and had devoted most of his time during the last 15 years to his *Handbook of Malesian Mosses*, of which three volumes have been published. This is the only full flora of SE Asia (Indonesia, Malaysia, Philippines and New Guinea). Volume 4 was not far from completion when he died, but the 5th volume, covering Hookeriales and Hypnales was scarcely beyond the planning stage. Fortunately,

Angie Newton at the Natural History Museum hopes to be able to recover most of the text and illustrations and start during this year to complete the missing parts of volume 4. The final volume will become two volumes, and will probably be edited by Ben Tan, of Singapore, the expert particularly familiar with these groups.

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

CHANGES TO THE MEMBERSHIP LIST, JANUARY 2000

CHANGES OF ADDRESS AND AMENDMENTS

Banwell, Mr A D, 4 Fairlawn Place, Private Road, Sherwood, Nottingham, NG5 4DD, UK, (O), (1939)

Bulin, Mr Werner, Nelkenweg 6, D-94152 Neuhaus/JNN, Germany, (O), (1976)

Chambers, Mr S P, 7 Cefn Melindwr, Capel Bangor, Aberystwyth, Ceredigion, SY23 3LS, UK, (O), (1997)

Drehwald, Dr Uwe, Kaakweg 1 A, D-37077 Goettingen, Germany, (O), (1990)

Drehwald, Maria Elena Reiner-, Kaakweg 1 A, D-37077 Goettingen, Germany, (F), (1994)

Glading, Dr Paul R, Fife Lodge, Silverdale Road, Arnside, Carnforth, Cumbria, LA5 0EN, UK, (O), (1979)

Grace, Mr Marcus, Research and Graduate School of Education, University of Southampton, Highfield, Southampton, SO17 1BJ, UK, (O), (1980); e-mail: m.m.grace@soton.ac.uk

Higton, Dr Roger N, 3 Bluebell Close, Bure Park, Bicester, Oxfordshire, OX6 9WJ, UK, (O), (1987)

Jensen, Mr H E, Augustagade 7, 3.TH, 2300 Copenhagen, Denmark, (S), (1998)

Jolley, Mrs H, 2 Ottawa St, Toongabbie, Sydney, NSW 2146, Australia, (O), (1999)

Klazenga Niels, National Herbarium of Victoria, Royal Botanic Gardens, Birdwood Avenue, South Yarra, VIC 3141, Australia, (O), (1997)

McMullen, Mr J Andy, 126 Formartine Road, Tillydrone, Aberdeen, AB24 2RH, UK, (O), (1993)

Muñoz, Dr Jesús, Real Jardín Botánico (CSIC), Plaza de Murillo, 2, E-28014 Madrid, Spain, (O), (1996)

Norris, Prof. Daniel H, 13404 N Echo Lake Rd, Snohomish, WA 98296 - 6193, USA, (O), (1978)

O'Neill, Dr John, 1 North White House, Stannington, Morpeth, Northumberland, NE61 6AW, UK, (O), (1990)

Pool, Mr M, 91 Warbro Road, Torquay, Devon, TQ1 3PS, UK, (O), (1982)

Rimington, Mrs E, 11 Wear View, Frosterley, Bishop Auckland, Co. Durham DL13 2RB, UK, (O), (1999)

Ross, Miss Sarah E, 11 Marmion Close, Fleckney, Leicester, LE8 8UL, UK, (S), (1995)

Smith, Dr A J E, 5 Queens Gardens, Llandudno, Conwy, LL30 1RU, UK, (1956) (H - 1994); e-mail: ajesmith@classicfm.net

Spare, Mr R, The Canal Tea Rooms, Lime Kiln Cottage, Lime Kiln Road, Tiverton, Devon, EX16 4AQ, UK, (O), 1957
Stark, Mr Gavin, Birchwood Hall, Storridge, Malvern, Worcs, WR13 5EZ, UK, (O), (1991)

NEW MEMBERS

Belland, Dr R J, Department of Biological Sciences, University of Alberta, Edmonton, Alberta, T6G 2E9, Canada, (O), (2000)
Carrick, Mrs T, Nuthatch, Moors Farm, Lakeside Court, Worcester Road, Upton Warren, Bromsgrove, Worcs, B61 7EY, UK, (O), (1999)
Cave, Mrs L, 4a Benjafield Terrace, Mount Stuart, Tasmania 7000, Australia, (O), (1999)
Clark, Miss J, Ael y Bryn, 1 Tai Brynhyfryd, Cwm y Glo, Caernarfon, Gwynedd, LL55 4DU, UK, (O), (2000)
Davies, Ms L, 14 Parkwood Road, Bexley, Kent, DA5 3NW, UK, (O), (1999)
D'Ossualdo, Ms D, Via Morpurgo 23, 33042 Buttrio (Udine), Italy, (O), (1999)
Duda, Mr S K, ul. Gostecka 19a, 27-320 Solec n/W, Poland, (S), (2000)
Gainey, Dr P A, 14 Polwithen Road, Penryn, Cornwall, TR10 8QT, UK, (O), (2000)
Hunt, Mr S, GFR, 75 Kingsland Terrace, Peebles, Scottish Borders, EH45 8HH, UK, (O), (2000)
Kennedy, Mr R, 12 Spring Hall Rise, Oldham, OL4 2TE, UK, (O), (2000)
Krayesky, Mr D M, Department of Plant Biology, Southern Illinois University, Mail Code 6509, Carbondale, IL 62901-6509, USA, (S), (1999)
Pedersen, Mr Niklas, Department of Botany, Stockholm University, S-106 91 Stockholm, Sweden, (S), (2000)
Perry, Mr G, 38 Staunton Road, Minehead, Somerset, TA24 6DY, UK, (F), (1999)
Richardson, Mr D A, Room 5, Flat T, Easton Halls, Eskdale Terrace, Jesmond, Newcastle upon Tyne, NE2 4DY, UK, (S), (1999)
Street, Mr L, Woodside, Insh, Kingussie, Inverness-shire, PH21 1NU, UK, (O), (2000)
Thompson, Mr G, 10 Alexandra Mews, Ormskirk, Lancashire, L39 1RH, UK, (S), (1999)
Vincent, Mr J R, 21 Groesfaen Terrace, Deri, Bargoed, Mid Glamorgan, CF81 9GH, UK, (O), (2000)
Walters, Dr J R, The Howe, Tebay, Penrith, CA10 3TZ, UK, (O), (2000)
Ward, Dr S D, Scottish Natural Heritage, 2 Anderson Place, Edinburgh, EH6 5NP, UK, (O), (2000)
Wilson, Mrs Jane, 45 Yardley Park Road, Tonbridge, Kent, TN9 1NB, UK, (O), (2000)
Williams, Mr Duncan, 7 Achany, Lairg, Sutherland, IV27 4EE, UK, (O), (2000)
Winning, Mr L H, 75 Cardinal Avenue, Kingston upon Thames, Surrey, KT2 5RZ, UK, (S), (1999)

RESIGNATIONS

Abderrahman, Dr Salim M, Dep. of Biological Sciences, The Hashemite University, Zarqa, Jordan, (O), (1998)
Ashton, Mrs Tracy, 101 Dinting Vale, Glossop, Derbyshire, SK13 9PB, UK, (S), (1997)
Dilkes, Mr Nigel B, 37 Sheppard Way, Minchinhampton, Stroud, Gloucestershire, GL6 9BZ, UK, (O), (1994)

- Gehu**, Professor J M, Centre Régional de Phytosociologie, Conservatoire Botanique National de Bailleul, Hameau de Hendries, F-59270 Bailleul, France, (O), (1969)
- Green**, Dr T G Allan, Biological Sciences, Waikato University, Private Bag 3105, Hamilton, New Zealand, (O), (1997)
- Gwynn**, Ms Elinor, Cae Coch, Rhostryfan, Caernarfon, Gwynedd, UK, (O), (1997)
- Herber**, Mr Ingemar, Majgardsvägen 7, S - 14144 Huddinge, Sweden, (O), (1992)
- Hughes**, Dr J G, Hazelrigg, 2 Blencathra Street, Keswick, Cumbria, CA12 4HP, UK, (O), (1952)
- Jones**, Mr R A, Countryside Council for Wales, Ladywell House, Newtown, Powys, SY16 1RD, UK, (O), (1998)
- Labeij**, Mr Willempie, Killaha east, Kenmare, Co. Kerry, Eire, (O), (1998)
- McAndrew**, Mr R T, 5 Thornhill Gardens, Hartlepool, Cleveland, TS26 0HX, UK, (O), (1979)
- Meier**, Markus, Josefstrasse 102, CH-8005 Zurich, Switzerland, (O), (1995)
- Neumayr**, Dr Ludwig, Ziegelstrasse 5 Thanhaussen, D-93173 Wenzenbach, Germany, (O), (1980)
- O'Brien**, Miss Charlotte E, 183 Barkers Butts Lane, Coudon, Coventry, CV6 1EF, UK, (S), (1998)
- Pant**, Dr G, Bryology Laboratory, Department of Botany, D S B Campus College, Kumaon University Nainital 263002, U P, India, (O), (1988)
- Pearson**, Mr David, 2 Blundell Terrace, Blackwell, Carlisle, Cumbria, CA2 4SL, UK, (O), (1998)
- Perry**, Dr Hilary J, 35 Cardiff Road, Dinas Powys, Vale of Glamorgan, CF64 4DH, UK, (O), (1987)
- Pettet**, Professor A, 11 Wilton Close, Deal, Kent, CT14 9AJ, (O), (1955)
- Priddle**, D Ross, 2367 Central Avenue, Victoria, B.C., V8S 2S3, Canada, (O), (1997)
- Ryan**, Mr Michael, 801 Frayne Road, R.R.I., Mill Bay, B.C., Canada, VOR 2PO, (O), (1998)
- Sclater**, Mr Alastair D, 54 Innis House, East Street, London, SE17 2JN, UK, (O), (1996)
- Shand**, Ms Ishbel, 94 Bon-Accord Street, Aberdeen, Scotland, AB11 6UY, UK, (O), (1997)
- Sheppard**, Mr Ralph, Carnowen House, Raphoe, Lifford, Co. Donegal, Ireland, (O), (1998)
- Wilson**, Mr G P, Rosedale, Perth Road, Crieff, Perthshire, UK, (O), (1967)
- Woodman**, Dr Julian, c/o Countryside Council for Wales, South Wales Area, Unit 4 Castleton Court, Fortran Road, St Mellons, Cardiff, CF3 0LT, UK, (O), (1996)
- Woolgrove**, Dr Clare, Thirlestane House, Kelso, TD5 8PD, UK, (O), (1989)

DEATHS

- Whitehouse**, Dr H L K, Botany School, Downing Street, Cambridge, CB2 3EA, UK, (1946) (H - 1988)