

BRITISH BRYOLOGICAL SOCIETY

PRESIDENT: DR H.L.K.WHITEHOUSE

BULLETIN

No. 39. February, 1982

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S U B S C R I P T I O N S

Subscriptions for 1982 became due on 1 January. Any members who are still in arrears are requested to pay up as soon as possible. This action will be very much appreciated and will obviate the need for expensive personal reminders later. Current subscription rates are as follows:

Ordinary membership £10: Junior membership £5: Family membership £1.

North American members may send their payment in US\$ (\$20:\$10:\$2) direct to Prof Nancy Slack, Biology Dept., Russell Sage College, Troy, NY 12180. Other foreign, and British, members should pay in £ sterling to our Membership Secretary, G.G. Geyman, 48 Gascoigne Gardens, Woodford Green, Essex, IG8 9NU, U.K.

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST DECEMBER 1980

<u>INCOME</u>	£	£
<u>Publications</u>		
Blackwells: Subscriptions to Journal of Bryology	4354-40	
Sales of Journal back issues	340-68	
Sales of Journal offprints	370-19	
Advertising in the Journal	49-00	
Sales through K.J. Adams (B.B.S. Library)	141-89	
Sales through A.J.E. Smith (Provisional Atlas/ Record cards)	<u>82-62</u>	
		5338-78
<u>General</u>		
Subscriptions from members	2926-24	
Reading Circle subscriptions	34-58	
Legacy (E.M. Lobley)	100-00	
Interest from National Savings Bank Investment Account	2094-00	
Interest from National Westminster Bank Deposit "	<u>15</u>	
		<u>5154-97</u>
		10493-75

STATEMENT OF AFFAIRS AS AT 31ST DECEMBER 1980

<u>LIABILITIES</u>	£	<u>ASSETS</u>	£
Blackwell's 1980 Account o/s	3983-34	National Westminster Bank	
Capital A/c b/f	10774-89	Current Account	365-98
<u>Add</u> National Savings Bank		Deposit Account	1-36
1979 interest, received		National Savings Bank	
16.1.80.	1377-52	Investment Account	16004-80
<u>Add</u> Surplus 1980	<u>236-39</u>		
	<u>£16372-14</u>		<u>£16372-14</u>

CERTIFICATE

We hereby certify that the Income and Expenditure Account, and Statement of Affairs, have been prepared from the books and statements presented to us by M. Pearman, Hon. Treasurer, and to the best of our knowledge and belief show a true statement of the affairs of the Society as at 31 December 1980.

Berkeley Hall & Co., Chartered Accountants, Shepton Mallet. 9 August 1981

EXPENDITURE

Publications

Blackwells: Vol. 11, Nos. 1 and 2:-

Paper	£	£
Artwork	583-20	
Printing	439-30	
Corrections	3969-30	
Binding	184-90	
Despatch	912-40	
Offprints	711-11	
	<u>319-70</u>	

7119-91

Blackwells: General Costs

Advertising	14-20	
Cost of Reprints	55-78	
Stationery	30-00	
Binding File Copy, Vol. 10	7-12	
Storage of Back Issues	25-00	
Sharing Cost of Post & Telephone	44-25	
Envelopes (1 issue)	34-43	
Accelerated Surface Post (1 issue)	<u>66-78</u>	

277-56

25% of subscription income	1088-60
25% of sales of back issues	85-17
35% of sales of offprints	129-57
Servicing 496 members @ 40p per issue	<u>396-80</u>

1700-14

Bulletin Nos. 35 and 36 printing costs

496-80

General

Expenses - Field Meetings	54-80	
- A.G.M./Paper-reading meeting	38-64	
- 10 km. square mapping (J.Appleyard/F.Rose)	210-80	
- Attendance of Belgian Conference (M.Corley)	75-00	
Stationery	33-90	
Postage	133-75	
Librarian's Expenses (mostly photocopying)	73-26	
Insurance of B.B.S. Library	15-30	
Subscription to Biological Council	7-50	
Refund of Subscriptions	<u>20-00</u>	

662-95

Excess of Income over Expenditure for Year

10257-36

236-39

£10493-75

PROCEEDINGS OF THE BRITISH BRYOLOGICAL SOCIETY

THE SPRING MEETING, 1981, STOWMARKET

Strategically placed astride line of longitude 1°E, the dividing line between the Vice-counties of East (Vc 25) and West (Vc 26) Suffolk, Stowmarket provided a central base for the Spring Meeting (8-14 April) facilitating ready access to all corners of the county. Thirty-two members attended the meeting and between them contributed some 1,480 records for 28 of the Suffolk 10 km squares, and some 32 new Vice-county records. We were pleased to welcome several new members from Suffolk, and the laboratory at Coombs Middle School, a short walk from the Cedars Hotel headquarters, made possible some instruction in microscope techniques during the evenings. Each morning the party kept together, exploring well known sites and giving instruction to beginners, and after lunch split up to explore underworked squares in the vicinity, with the impending deadline for the mapping scheme very much in mind. In the following account * refers to confirmed new Vice-county records.

9 April (Vc 26). In the morning members explored several Breckland heath remnants, under the guidance of Dr Whitehouse, in delightfully warm sunshine. At Icklingham Plain, Rhytidium rugosum, Racomitrium canescens var. canescens, Rhynchostegium megapolitanum, Climacium dendroides and Ptilidium ciliare were seen, and among others Bryum inclinatum and Campylopus introflexus were added to the list for the site. Members were also shown Pleurochaete squarrosa on a roadside bank. Sadly, as the party left to make its way to Cavenham Heath, Derek Foster had to return home owing to ill health, the last many of us were to see of him. In Ash Plantation at Cavenham Heath *Pellia neesiana by a swamp stream was a welcome surprise, but Trichocolea tomentella was not re-found. One party devoured the first of their packed lunches from the Cedars by a patch of Crassula tillaea in full flower at Temple Bridge, and then carried on down the track to visit Tuddenham Heath. Although nothing was added to the list for the site, Lepidozia reptans with sporophytes and Rhizomnium pseudopunctatum are worth a mention. The rest of the party consumed their packed lunches at the back of a rather busy nearby pub., and then went on to seek (but not to find) Dicranum polysetum in the conifer plantations at Brandon Park. Beginners were, however, very pleased to find an extensive patch of Polytrichum longisetum with borders so wide that the leaves appeared striped from some distance away. The party then subdivided to explore nearby squares; the churchyard and castle moat at Lidgate yielded Frullania dilatata, Metzgeria fruticulosa and *Fissidens pusillus var. tenuifolius; the churchyard at Hawstead *Rhynchostegiella tenella var. tenella, *Barbula cylindrica and *Brachythecium populeum; and a rape field at Bradfield Combust Sphaerocarpos michelii and *S. texanus.

10 April (Vc 25). Members arrived in force at Notcutts Nurseries in Woodbridge and competed for attention with customers inspired by yet another delightfully warm spring day. After being retrieved from a seed patch with handfuls of the delightful Mibora minima (fortunately regarded as a weed) the party was let loose on some fallow beds to the north-east of the main centre and quickly fell upon hands and knees. The search was rewarded by finding both Sphaerocarpos michelii and S. texanus (plus an annoyingly

similar gregarious alga) together with Riccia glauca, R. sorocarpa and an abundance of *Marchantia alpestris. A brief look at a potted-plant enclosure revealed very little, but the discovery of Barbula rigidula carpeting the trunk and branches of a Malus sp., heavily encrusted with lime and sopping wet from a continuous spray of water from a hose fixed above it, provoked learned comment of an ecological flavour. The party then proceeded to explore a stream that ran through the gardens, suitably furnished with a variety of rocks, and found Barbula tophacea, B. trifaria, B. vinealis and *Gyroweis tenuis, before reclining on the lawns to demolish a well-earned packed lunch and to pose for a group photograph. After lunch the Cherry Tree beds to the south-west of the main centre were explored. Nothing exciting turned up, but a voucher of *Pellia endiviifolia was collected for Vc 25. The party then split into groups and dispersed to investigate five different 10 km squares, all returning with reasonable lists (including *Tortula subulata var. angustata, from a wood near Shottisham); except for the group that ventured into some roadside woodland at Seven Hills, Nacton and were seen off by the estate manager in no uncertain terms. They were, however, rewarded with better pickings later in the afternoon. After a long hot walk down to the shore at Levington beginners were pleased to see Fissidens incurvus, F. exilis, F. bryoides and F. taxifolius growing together in nearby woodland. On returning to the cars Sphaerocarpos michelii was found growing abundantly with a yellow-flowered Amsinckia in a beet field.

11 April. Having been rather spoilt by the unseasonable warmth and smarting from incipient sunburn, members did not look very happy as they assembled in driving rain on the Norfolk side of Redgrave Fen and were not even amused as our guide's map, sketched in fibre-tipped pen, dissolved before their eyes. The rain soon eased off, however, and exploration began. These watershed fens have suffered in recent years from excessive extraction of water from the chalk aquifer that normally tops up the fens throughout the drier months, and the list of species found was but a vestige of its former richness. The fens yielded little other than *Eurhynchium speciosum (Vc 26), Ctenidium molluscum, Drepanocladus aduncus and Chiloscyphus sp. In some scrubby woodland along the southern margin an attempt to make Dicranum scoparium into D. majus proved ill-founded. Despite extensive forays into the dense rain-soaked sallow beds of Middle Fen (Vc 27), the only epiphytes found were Dicranoweisia cirrata, Orthotrichum diaphanum, O. affine and a few scraps of Ulota crispa. The latter is apparently on its way out in this area, having already been largely exterminated further south, probably the result of a steady increase in rain acidity. After lunch the skies cleared and warm sunshine inspired the exploration of Market Weston Fen (Vc 26), where younger members were able to see the sort of bryophyte flora that used to be found at Redgrave. Plagiomnium elatum and Eurhynchium speciosum abounded around the base of sedge tussocks; Fissidens adianthoides, Campyllum elodes, C. stellatum and C. polygamum were found in the open fen to the east of the main track; and Ctenidium molluscum and Sphagnum subnitens to the west of track. Homalothecium nitens, recorded here in 1979, was not refound and despite careful searching could not be found by the parties that went on to visit Hopton and Thelnetham fens (both Vc 26). At Hopton Fen *Dicranum tauricum was found on a willow and *Tortula virescens was also new; and at Thelnetham Fen Calliergon giganteum, Campyllum polygamum

and C. stellatum were recorded. On the way back from the fens a brief visit to Knettishall Heath (Vc 26) revealed the presence of an abundance of Ptilidium ciliare (and little else), but as most parties converged on Wortham Ling (Vc 25) hoping to see Leptodontium gemmascens, found there on rotting grass by Peter Wanstall and Alan Harrington a few weeks before, the day was made by finding it in abundance over a wide area of the heath. Although mostly confined to a black sticky paste formed by rotting grass the Leptodontium was also found growing up the stems of gorse, and despite its apparent rarity in Britain several people managed to establish cultures from the abundant gemmae, suggesting that its requirements may not be that exacting and it may well have been overlooked in this type of habitat.

12 April. Billed as a free day, members nevertheless visited the suggested venue of Mickfield Meadow Reserve (Vc 25) to see the Fritillaries coming into flower in the morning and then went on to work no less than eleven 10 km squares during the afternoon. New Vcr's for the day were *Tortula virescens by the Gipping at Stowmarket (Vc 25), *Gyroweisia tenuis at Ringshall Churchyard (Vc 26) and *Fossombronina pusilla plus *Isothecium myosuroides for the Bulls Wood Reserve at Cockfield (Vc 26).

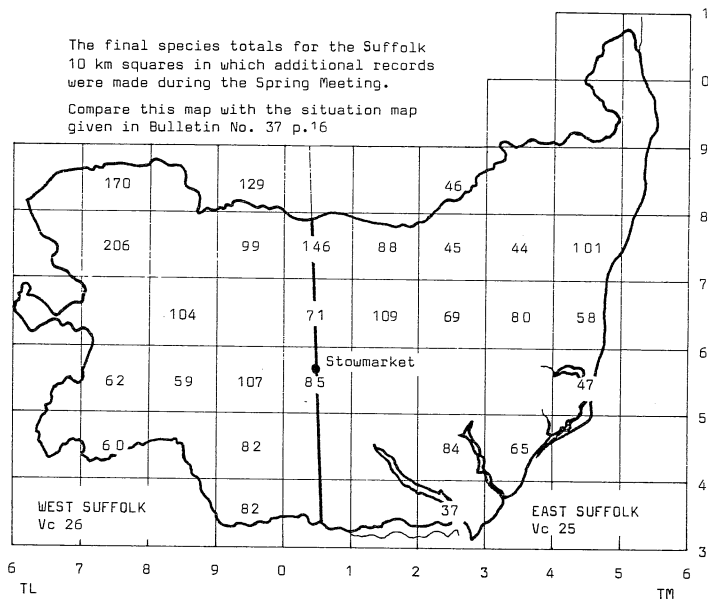
13 April (Vc 26). Members assembled at Felshamhall Wood (Bradfield Woods) in the morning in a biting wind and added several species to the list from the asbestos cement roof of the hut, including Orthotrichum diaphanum and O. anomalum, while waiting for Oliver Rackham to show the party round. Along Shady Ride a large diameter oak stump was carpeted with Tetraphis pellucida sporting abundant capsules, a rare site in eastern England. Most of the effort was concentrated on exploring a damp area in Plantation Fell. Although Herzogiella seligeri could not be refound, Plagiothecium latebricola was abundant on tree bases and *Dicranum montanum was found on oak stumps and a hazel stool. In all fifteen species were added to the list for the wood. During the day several parties converged on Arger Fen, an area of marsh and woodland belonging to Col. Heyland, and the nearby (Sabre-toothed) Tiger Hill, the last of the south-Suffolk heathlands. At Arger Fen a swampy stream drained into an Alder swamp in the valley among abundant Chrysosplenium alternifolium. Plagiothecium latebricola was found here, and Calliergon stramineum further upstream. At Tiger Hill a small grazed area of heathy grassland over glacial gravel, with little of note other than Dicranum scoparium, descended into the remnants of Tiger Hill Wood. *Pohlia lutescens was found in rabbit holes and on bare ground under bushes, and *Metzgeria fruticulosa in abundance on an old elder.

14 April (Vc 25). A biting cold wind again greeted the party, now somewhat depleted, on their arrival at the Walberswick Bird Reserve. but spirits rose as we penetrated Fen Covert, an extensive area of swampy secondary woodland with several acres of Sphagnum carpet. Although S. teres was not refound, there was an abundance of S. squarrosum, S. fimbriatum, S. palustre and scattered patches of *S. auriculatum var. inundatum. As the party penetrated further to the east the going became very swampy and much older woodland was encountered; here were found *Rhizomnium pseudopunctatum, Dicranum bonjeanii, Cephalozia connivens and *Hypnum mammillatum. An abundance of Thuidium tamariscinum growing among Sphagnum

palustre made for the unusual. Out in the keen wind again, Ptilidium ciliare was searched for in vain amongst the heather, but Bryum bornholmense was winkled from the car-park area. In the afternoon, fortified by the last of the Cedar's packed lunches, most members headed for home, but one small intrepid party ventured south to Westleton Heath, to find little other than Orthodontium lineare and Cephaloziella divaricata (starkei) on peat among the heather; and thence to an equally boring Dunwich Heath where, despite having had to pay to enter onto the heath, everyone other than Eustace Jones rapidly returned to the cars rather than face the wind. Once down by the dyke that separates the heath from Minsmere, however, the sun could be appreciated; Riccia fluitans was found here growing with Hypericum elodes. On the way back to Stowmarket a final stop was made at Framlingham where the castle walls and the river floodplain were explored adding 46 species to the card for the square.

Once back in Stowmarket the survivors made for the Magpie, hoping for a quick enjoyable meal at the only place in town that appeared able to rustle-up food in less than an hour, - only to be disappointed - it happened to be their one night off! Had the Cedars been able to deliver meals at a reasonable price and in a reasonable time the Spring Meeting would have been a far more pleasant and congenial gathering. Fortunately the fine weather more than compensated for the inconvenience. Thanks are due to Dr Whitehouse, Richard Woolnough (Suffolk Trust), Colin Ranson, John Shackles and Geof. Radley (NCC) for helping to arrange the itinerary at such short notice.

KENNETH J ADAMS



THE SUMMER MEETING, 1981, NEWTONMORE AND CRIANLARICH

First week: Newtonmore, Inverness, 21 - 28 July

Exactly twenty-five years after the last BBS meeting on Speyside, Newtonmore was chosen as the base for a fresh look at the region's bryoflora. It was hoped to demonstrate a range of habitats and local specialities to those unfamiliar with the area, and to look at some poorly-known localities as a contribution to the mapping scheme. Speyside is famous for its pine forests, ospreys, marshes, and the Cairngorm massif to the south with its tundra-like summit plateau, spectacular corries, late snow-lie areas and associated arctic-alpine flora and fauna. Excursions were planned to cover not only these mountains, but also some of the surrounding hills and several lowland habitats. Wallace (1957) in his report of the Aviemore meeting, provided an excellent guide to the district's bryoflora, along with earlier accounts by Wilson & Wheldon (1908) and Wheldon & Wilson (1910).

This year's meeting was well-attended with fourteen participants: Gerard Dirkse, Nol Luitingh and Huub van Melick (Netherlands), Donal Synnott (Ireland), Peter Bullard, Lindsay Kerr, Martin Crundall, Michael Fletcher, Peter Martin and Jean Paton (England) and Philip Lightowlers, David Long, Claire Geddes and Sandy Payne (Scotland). Several of these braved the rigours of the local camp-site and midges; others preferred more comfort, but all enjoyed the hospitality of the HQ hotel and its kilted landlord during the week.

21 July for most entailed a long rail or road journey northwards; Jean Paton and David Long paused briefly at the Falls of Truim near Newtonmore (96) where Scapania lingulata, recently added to the British flora, was found in a new locality on rocks by the river.

22 July was wet and overcast but suitable for several lowland sites; firstly Creag Dubh near Newtonmore (96), an area of Betula woodland overshadowed by steep cliffs. Numerous woodland species were seen but the acid screes were of greatest interest with Antitrichia curtipendula in huge cushions, Frullania fragilifolia and two local specialities, Cynodontium jenneri and C. tenellum, the last having its stronghold in Britain in this area.

After lunch we assembled at the RSPB reserve at Insh (96) where the warden, Russel Leavett, kindly led a waterproof-clad group through dripping birch and juniper down to the margin of the extensive marshlands spreading across the valley. In places poor fen occurred and swards of Sphagnum subsecundum s. str. were conspicuous, some plants with capsules, interestingly the first record of fruiting in Britain. On the way to the marshes Dicranum tauricum, Rhodobryum roseum and Plagiomnium affine were found in the woodland. Despite the rain and poor light, most people carried on to the picturesque Loch an Eilein, Rothiemurchus (96) with its ruined castle, where Ptilium crista-castrensis, although not rare in the district, was a novelty for several; a hurried search for limestone on Ord Ban did produce fine Tortula princeps on a wall and Lophozia longidens on a boulder.

23 July. This first of several mountain days dawned grey and wet

but we stuck to the scheduled walk up into Coire Chuirn (96) in the poorly-known Drumochter Hills where basic rock had been reported by Alan Crundwell. The bryoflora was found to be quite rich. In basic flushes below the N-facing cliffs Barbilophozia lycopodioides, Harpanthus flotowianus, *Moerckia hibernica and Tritomaria polita were found, and on cliffs and detached boulders nearby Ditrichum zonatum, Grimmia torquata, Kiaeria blyttii, Herbertus stramineus, Radula lindenbergiana and Scapania aequiloba. After lunch the party braved the windswept plateau above where Derek Ratcliffe had reported Sphagnum lindbergii and Splachnum vasculosum many years ago. The Sphagnum eluded us but our second Moerckia of the day, M. blyttii, was seen on bare peat. We descended a small valley in the next grid square northwards, which proved to have some very fine flushes, in places pink with Bryum weigelii; Philonotis seriata was also common and amongst it some small patches of Splachnum vasculosum were detected. Philip Lightowlers spotted some beautifully gemmiferous Oedipodium griffithianum on soil amongst unstable scree, and Herzogiella striatella, another 'specialty' of the district, grew on a turfy ledge by the burn. On the way home sheets of exposed mud by Loch Erich (96), though attractive from the road, proved almost completely barren, but a single rosette of Haplomitrium hookeri lurking amongst clumps of Juncus justified the diversion.

24 July. Creag Meagaidhu (97). In 1956 the BBS visited the spectacular, and bryologically rich, Coire Ardair but we chose the lesser-known Coire Choille Rais (or Moy Corrie) which entailed a steep climb, tackled energetically by all with only brief halts to look at red deer and a rather red liverwort, Pleurozia purpurea, on wet peat - an indicator of more oceanic conditions. Several hours were spent in the corrie but few of the Coire Ardair specialities were found. Nevertheless, other nice finds were made, firstly in block scree at the lip of the corrie, with Hylocomium umbratum, Lescuraea patens, and Anastrophyllum donianum. Donal Synnott collected some very fine Plagiothecium platyphyllum in a flush by the loch. The cliffs and scree on the north side of the loch were then explored and Jean Paton turned up some good hepatics - Diplophyllum taxifolium, Lophozia opacifolia, Marsupella adusta and M. alpina, but the best find of the day was reserved for Donal Synnott in his discovery of Rhizomnium magnifolium at the base of a wet cliff. A brief excursion to the plateau above and summit ridge by David Long produced abundant Marsupella brevissima and a little M. condensata and Ditrichum zonatum in the mist.

25 July. Saturday had been reserved for what we hoped would be a spectacular bryological feast, namely the summit plateau of the Cairngorms, and in this our optimism proved to be amply justified. For speed and to rest tired limbs (but not without soul-searching by some) principles were cast aside for the comfort of the Cairngorm chair-lift which whisked us up into the mist at 4000 feet. After a short walk to the summit and some compass-navigation we descended the steep footpath through Coire Raibert out of the mist into the huge amphitheatre of the Loch Avon valley in the county of Banff (94) which seemed mild and humid after the exposed summit. Loch Avon lies at 2400 feet and is of particular interest not only for the rare species previously recorded there, such as Andreaea nivalis and Polytrichum sexangulare, but also as the only locality where Anastrophyllum donianum has ever been found with sporophytes, by R.K. Greville in 1830. We made our way to the SW end of the

loch, noting *Campylopus introflexus on the way, and spending about an hour searching the fine block scree, before (and during) lunch. In the deep recesses we found luxuriant mossy turf with oceanic species such as Dicranodontium asperulum, Anastrophyllum donianum, Bazzania tricenata, *B. trilobata, Scapania gracilis and *Lepidozia pearsonii. A few cushions of Chandonanthus setiformis grew on the boulders. Nearby, on another large block, a tuft of *Paraleucobryum longifolium was collected by Sandy Payne, a species thought to be extinct in Britain and thus a most important and exciting discovery.

After lunch we climbed the steep rocky slope by the Feith Buidhe burn; in scree Anastrophyllum donianum was abundant but apparently all sterile, along with patches of Scapania nimbose, S. ornithopodioides and a little *Brachythecium glaciale. On wetter slopes higher up Donal Synnott again found *Rhizomnium magnifolium, amongst extensive sheets of Moerckia blyttii with sporophytes, Dicranum glaciale, Pohlia ludwigii, Polytrichum sexangulare, *Anthelia juratzkana, *Harpanthus flotowianus and *Lophozia opacifolia. Several small patches of an as yet unidentified Bryum were also seen. Deteriorating weather accelerated our ascent on to the Feith Buidhe plateau above, to look at the late snow-lie areas, this year with little snow persisting. Patches of *Ditrichum zonatum and a little *Haplomitrium hookeri were noted but careful searching by Jean Paton revealed numerous interesting hepaticae - Diplophyllum taxifolium, Gymnomitrium apiculatum, Marsupella alpina, M. condensata, M. stableri, Nardia breidlerii and Pleurocladula albescens. Andreaea nivalis and Marsupella sphacelata grew luxuriantly on stones in a snow-melt stream. A brisk walk back to Cairngorm and descent on foot completed a highly successful day.

26 July. To the west of the main Cairngorm massif lies Glen Feshie (96) where the 1956 meeting made several important bryological discoveries in the upper part of the glen. We chose a side valley, Goire Garbhlach, less well-known but with outcrops of basic rock and entailing a comparatively gentle walk. The scree below the cliffs was steep and unstable and we worked along the base of the cliffs, gullies and buttresses. In the scree and turf Lepidozia pearsonii and Plagiochila carringtonii were detected in small quantity. The basic cliff ledges proved quite rich with the following list: Amphidium lapponicum, Anoetangium warburgii, Arctoa fulvella, Dicranodontium uncinatum, Hypnum hamulosum, *Isopterygiopsis muellerana, Meesia uliginosa, Mnium thomsonii, Orthothecium intricatum, O. rufescens, Philonotis tomentella, Herbertus stramineus, Jungermannia borealis, J. confertissima and *Scapania calcicola. Wet flushed slopes had luxuriant growth of Tritomaria polita, Cratoneuron decipiens and Rhizomnium magnifolium, all under rather basic conditions. After lunch on a precarious but panoramic ledge the party climbed out on to the plateau to enjoy the sunshine and magnificent view; time permitted only a brief look in the flushes by the stream entering the corrie, where Philonotis seriata, Pohlia ludwigii and Scapania paludosa were noted. We walked back over Meall Dubhag where two dotterel were studied before descending to the glen below.

27 July. After four consecutive mountain days, thanks to fine weather, a less strenuous lowland day was planned for the last day. First was a guided tour of a dead sheep on boggy ground in Glen

Banchor (96), detected by Mrs Paton the year before, and now colonised by four members of Splachnaceae, Tetraplodon mnioides and Splachnum ampullaceum with abundant capsules, and sterile Aplodon wormskjoldii and Splachnum sphaericum, a rare and remarkable (and much-photographed) sight. We then drove to Loch Garten, Abernethy Forest (96) famous for its ospreys which were duly inspected, followed by a leisurely stroll through the nearby pinewoods. A search for Buxbaumia aphylla was unsuccessful, but the junipers produced Ptilidium pulcherrimum and Sphenolobus helleranus, old stumps *Orthodontium lineare and Cephaloziella rubella and amongst leaf litter Ptilium crista-castrensis and Dicranum polysetum. The valley bog between Loch Garten and Loch Mallachie was of interest for several Sphagna and associated small hepaticae - Barbilophozia kunzeana, Calypogeia sphagnicola, Cephalozia leucantha and C. loitlesbergeri. The lochside provided a comfortable picnic site, before moving on to a famous bryological site - the Lochan Uaine (Green Loch) at the Pass of Ryvoan, celebrated for its scree slope with Cynodontium strumiferum and Anastrophyllum saxicola. Both were seen as they had been in 1956, but just as interesting were several plants not noted there before, on gravel by the Allt na Feith Duibhe, namely Fossombronia incurva, *F. fimbriata, Haplomitrium hookeri, Nardia geoscyphus and Riccardia incurvata, and nearby Lophozia longidens on juniper and Diplophyllum obtusifolium on a bank. This rounded off a very pleasant day, a fitting end to the week.

The meeting demonstrated that even a relatively well-known area like Speyside can yield interesting new records; most gratifying were the find of Paraleucobryum longifolium, new records for Rhizomnium magnifolium, Fossombronia fimbriata, Scapania lingulata and Sphagnum subsecundum with fruit. Lophozia opacifolia was found to be common on all the mountains visited, and the two records of Tritomaria polita extended the known range of the local species. A total of 321 species were seen during the week, records compiled for ten grid squares, and four site-reports compiled for the NCC and RSPB. I would like to thank John Birks, Jean Paton and Sandy Payne for help with planning the week, landowners for access and those whose cars provided transport for us.

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D.G. LONG

Second week: Crianlarich, Perthshire, 28 July - 4 August

Eighteen took part in the second half of the 1981 summer meeting at Crianlarich, a diverse assortment including professional botanists, students, research students, a school teacher, a

pharmacologist, an officer of the Forestry Commission, three Dutchmen and an Irishman. Crianlarich does not have the facilities one would hope for in the ideal headquarters and nobody was able to stay in the headquarters hotel because it was booked-up by a coach party, but Tyndrum is worse, and for a meeting in W. Perthshire and E. Argyll there is nowhere else. Hospitality in guest houses ranged from lavish, trout and bacon for breakfast, to chilly, in the only large house which would accept single bookings. The weather happily made up for the shortcomings of the headquarters and by the time the participants returned each evening their mood was languid rather than discriminating. Almost 400 species were seen on the seven excursions. The most rewarding excursions were to Beinn an Dothaidh and Ben Oss, both of which were formerly poorly known but both of which turned out to be rich bryological sites. Beinn a'Chreachain, which was completely unknown before, also had a few pleasant surprises. The most interesting new finds were probably Odontoschisma macounii in its third British locality, Ditrichum plumbicola in its second Scottish locality, Scapania parvifolia in four new sites and "Barbula jamesonii"† on two mountains from which it was not known, or where it had not been seen for many years.

29 July. Beinn an Dothaidh 27 325410 and Beinn Dorain 27 325290

One or two of the party had visited Beinn Dorain, where "Barbula jamesonii" grows, before, so the interest of that mountain was already well known. Beinn an Dothaidh had recently been visited by the BSBI who were excited by its vascular plants, so although its bryological interest was unknown, most of the party were keen to go to Beinn an Dothaidh, in the hope of finding a new site for "B. jamesonii". This was not found but there was much else of interest. We walked up the N. side from Achallader and stopped on the way to look at the E.-facing rocks at 328416, where we saw Plagiochila carringtonii. Most of the party spent most of the day on the N-facing cliffs which have a lot of basic rock. Here we found Bryum dixonii, Encalypta alpina, E. ciliata, Isopterygiopsis muellerana, Oncophorus virens, Oedipodium griffithianum, Orthothecium intricatum, O. rufescens, Plagiopus oederi, Eremonotus myriocarpus, Haplomitrium hookeri, Jungermannia subelliptica, Leiocolea heterocolpos, Mastigophora woodsii, Scapania calicicola, S. ornithopoides and S. nimbosa. Towards the top of the cliff there are gullies which probably hold patches of late-lying snow, with Arctoa fulvella, Kiaeria blyttii, K. falcata and K. starkei, Pohlia ludwigii, Anthelia juratzkana, Moerckia blyttii and Pleurocladula albescens. Three members climbed across to the NW. and W. sides of Beinn an Dothaidh where they found, besides some of the plants already listed, Leptodontium recurvifolium, Mnium thomsonii and Harpanthus flotoianus. Odontoschisma macounii was found in at least three spots on Beinn an Dothaidh, on the N. cliffs and on the W. side, making this its third British station.

Two or three members went on to Beinn Dorain in the afternoon but were not able to spend long there, and still did not find "Barbula jamesonii". On the lower slopes of the N. side they saw Herzogiella striatella, Orthothecium rufescens and Radula

† This plant, although once identified as that species by Zander, is not B. jamesonii, but a different species. A name (Bryoerythrophyllum sp.) will be published by D. Long.

lindenbergiana, but Calypogeia trichomanis was the only noteworthy plant not seen on Beinn an Dothaidh.

30 July Ben Lui 27 265265

The excursion to Ben Lui was kindly led by David Long, while the local secretary returned to Edinburgh for the day. Mrs Burton, one of the Crianlarich landladies, arranged for the party to approach Ben Lui by way of Cononish and to park at her son's farm. Crossing the railway on the track to Cononish is an adventure in itself. The crossing gates have large Forestry Commission padlocks and there is a telephone beside the gates connected to the signal box at Crianlarich. Anyone wishing to cross the line by car telephones the signaller, who tells them the time the last train left Crianlarich and comments rather non-committally on the likelihood that it has passed Tyndrum. With this trap for unwanted but unwary visitors, Mr Burton and the Commission appear to find it unnecessary to lock the padlocks.

On the way to Stob Garbh (280271), the party stopped at an old lead mine beside Allt an Rund (277275) and found Ditrichum plumbicola, a second Scottish locality about four miles from the first at Tyndrum. Campylopus schwarzii was found in a sinkhole on the other (S.) side of the stream.

On the low cliffs of Stob Garbh there is a rich calcicole flora with several western hepatics; Gymnostomum insigne, Mnium thomsonii, Myurella julacea, Philonotis tomentella, Apometzgeria pubescens, Diplophyllum taxifolium, Jungermannia confertissima, J. subelliptica, Mastigophora woodsii, Plagiochila carringtonii and Scapania degenii were found. A lot of "Barbula jamesonii" was also seen, but with only modest excitement here where it was found in 1891. Anoetangium aestivum, A. warburgii and Gymnostomum insigne were all found fruiting. Beneath the cliffs are basic flushes with Calliergon trifarium, Meesia uliginosa, Sphagnum warnstorffii and Tritomaria polita.

One or two members went on to explore the smaller N-facing corry and the summit of Ben Lui. They found Oncophorus wahlenbergii, Anastrophyllum donianum, Anthelia juratzkana, Plagiochila carringtonii, Pleurocladula albescens and Marsupella stableri, but failed to find Odontoschisma elongatum or Polytrichum sexangulare which have been recorded from Ben Lui.

31 July Meall na Samhna 27 485334

We climbed Meall na Samhna from Glen Lochay, to see Aongstroemia longipes which grows at the end of the Hydro Electric Board road above Low Botaurne. We assembled at Low Botaurne bridge half an hour late, after the Nature Conservancy's Avenger, following at a very safe distance in the BBS convoy, sustained a broken windscreen from a stone thrown up by the car in front with a red rear number-plate. A solicitous lady rushed from her house with a brush and dust-pan, while the driver of the car with the red number-plate drove on oblivious. The Nature Conservancy's car was abandoned at Hamish MacGregor's Garage in Killin. Mr MacGregor located a replacement windscreen in Dundee and had it fitted by the time the party passed through Killin in the evening.

From the end of the Hydro Board track, where Jean Paton also found Fossombronina incurva, we walked to the head of the Allt Inniscaorach,

looking in some of the flushes on the way, where we found Oncophorus virens and Calliergon trifarium. The cliffs above the head of the stream, some of the flushes at the foot of the cliffs and the long gully of wet scree which is the source of the stream, have a very rich flora with many more rare mosses than any of the sites visited so far: Aulacomnium turgidum, "Barbula jamesonii", Cratoneuron decipiens, Cinclidium stygium, Dicranella grevilleana, Encalypta alpina, Hypnum bambergeri, Meesia uliginosa, Myurella julacea, Oncophorus virens, O. wahlenbergii, Plagiothecium cavifolium, Rhizomnium magnifolium and Timmia norvegica. There were also several commoner mosses which we were surprised to see on cliffs at 800m: Barbula spadicea, Brachythecium glareosum, Entodon concinnus, Homalothecium lutescens. Mr Townsend found Dryptodon patens fruiting. Among the hepatics were Apometzgeria pubescens, Barbilophozia lycopodioides, Eremonotus myriocarpus, Jungermannia borealis, J. confertissima, Leiocolea heterocolpos, Scapania degenii and S. scandica. Meall na Samhna was the first of the four places on the meeting where Scapania parvifolia was found, each time, apart from one happy accident for the local secretary, by Mrs Paton who modestly comments "clearly not as rare as previously thought".

1 August Crannach 27 352458; Loch Tulla 27 295425; Beinn a' Chreagain 27 373441

Crannach is a native pinewood, with a railway and a line of pylons running through it. For the second time we parked our cars at Achallader, and walked to Crannach along the track. Much of the wood was disappointing, one suspects it is too dry, and before diesel engines took over the West Highland Line, sparks from the funnels of steam engines regularly set it on fire; but Mrs Paton found Scapania scandica and Sphenolobus helleranus, and Mr Long, Antitrichia curtipendula. Mrs Paton also found again Scapania parvifolia, on the banks of the Water of Tulla.

After lunch half the party returned to L. Tulla, where, on the NE. shore, Campylopus subulatus ('very fine'), Pohlia filum ('very fine and abundant' with P. bulbifera and another bulbiferous Pohlia without bulbils) and Odontoschisma elongatum were found. The latter was found again at the SE. corner of the loch. One member swam.

The other half of the party climbed to Coire an Lochain on Beinn a' Chreagain (370445) where, on the predominantly acid cliffs, they found Oedipodium griffithianum, one or two flushes with Rhizomnium magnifolium and Scapania paludosa, and at least one small area of basic rock near the top of the corry at c.370443 with Plagiomnium medium, Plagiothecium cavifolium and Lescuraea patens.

2 August Free day

Most of the party visited Ben Heasgarnich which, after a few exchanges at cross purposes with the farmer at Kenknock, they now know should be pronounced 'Hesnick' (they are still unsure how to say Kenknock). Many of us missed some of the well known rarities, but found Campylopus schwarzii, Cratoneuron decipiens, Ditrichum lineare, Hylocomium pyrenaicum, H. umbratum, Isopterygiopsis muellerana, Kiaeria falcata, K. starkei, Marsupella brevissima, Nardia breidleri, Scapania parvifolia and S. uliginosa. Two of the group who searched the lower part of Coire Heasgarnich saw Odontoschisma macounii, Aulacomnium turgidum

Mr Long went to Meall Ghaordie, again looking for "Barbula jamesonii", and he found Cratoneuron decipiens, Mnium thomsonii, Oncophorus wahlenbergii, Rhizomnium magnifolium, Barbilophozia quadriloba, Marsupella stableri, Scapania degenii and Tritomaria polita.

3 August Glenfalloch Woods 27 322201; Stuckindroin 27 319147;
Clifton/Lochan na Bi 27 325305 - 308313

After lunch we visited the wooded ravine at Stuckindroin, where the farmer allowed us to park in the farmyard and told us all about the best spots for mosses in the neighbourhood, strongly recommending Ben Oss. Along the stream and in the ravine we found Sematophyllum micans on wet sloping rocks, Harpanthus scutatus on a peaty bank and Leptoscyphus cuneifolius on birch trunks. Higher up, where the ravine is deeper, Herbertus aduncus ssp. hutchinsiae, Bartramia hallerana and Frullania microphylla grow on the cliff-like NW-facing rocks.

4 August Ben Oss 27 288253

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Most of the party worked their way back, retracing the trail of footprints and cigarette ends, but Mr Long and Mr Fletcher climbed on to the summit of Ben Oss (Marsupella brevissima) and the E-facing cliffs in vc 87, where they found Ditrichum zonatum var. scabrifolium, Pohlia ludwigii, Moerckia blyttii, Scapania nimbosa and S. ornithopodioides, all new records for vc 87. Not content with the summit of Ben Oss, Mr Long went on to the summit of Beinn Dubhraig where he collected Nardia breidleri and Anthelia juratzkana, also new to vc 87.

I had a lot of help in preparing the programme for the meeting from David Long and Dr David Chamberlain, who suggested places to visit. Peter Wormell, Dr Rick Keymer and Dr Rosalind Smith of the Nature Conservancy Council kindly put me in touch with or asked permission on our behalf of most of the landowners whose land we crossed. The landowners, farmers and gamekeepers were, without exception, agreeable and helpful. I am very grateful. I am also grateful for the enthusiasm and appreciativeness of the members who attended the meeting.

P.H. PITKIN

THE ANNUAL MEETING, 1981, LANCASTER

The paper-reading meeting held in the Department of Biological Science, University of Lancaster, on the weekend of September 19-20, was ideally situated to provide a convenient meeting place for members from all over Britain. It was therefore pleasing to see that England, Scotland and Wales were all well represented by those members who had taken advantage of the opportunity. They were well rewarded by the high standard and variety of topics covered by the speakers, who were introduced by the Vice-President. Contrasting pictures of the bryophyte floras of areas close to Lancaster were presented and a look at aquatic bryophytes from the Antarctic reminded us that similar adaptations have been reported in the English Lake District. Also included was an interesting survey of historical changes in the British bryophyte flora and a wide-ranging and thoughtful consideration of conservation needs. In some ways, the latter was complemented by the speaker who advocated photographic recording of species and went on to demonstrate his skills in the art. Summaries of these papers are given below.

Dr M.C.F. PROCTOR (Exeter): "Mosses and liverworts of the Malham Tarn district."

Malham Tarn lies almost midway between John o'Groats and Lands End, and close to the Pennine watershed; with its varied topography and geology, its surroundings have a rich and interesting bryophyte flora. The district lies in one of the major areas of Carboniferous Limestone in Britain. Calcicole species are conspicuous, and a number of rare limestone species have their British headquarters here, e.g. Pedinophyllum interruptum, Zygodon gracilis, several Seligeria spp. Acid substrata include Carboniferous shales and grits and Lower Palaeozoic slates, and glacial drift and peat. The mire complex of the Tarn Moss and fens is a major element in the habitat diversity of the immediate surroundings of the Tarn. Bryophytes are important in defining some of the main

phytosociological divisions in mire vegetation, which in turn provide a useful framework for comprehending patterns of bryophyte distribution and suggesting the habitat factors that determine them. Like other hilly areas, the Malham district is a meeting place of northern and southern species. The latter tend to favour sheltered or south-facing lowland sites (e.g. Isothecium striatulum, Cololejeunea rossettiana) while the former generally occur at higher altitude and often in shady or damp north-facing situations (e.g. Distichium capillaceum, Orthothecium rufescens, Pseudoleskeella catenulata, Anastrepta orcadensis); some similarities and differences in the distributions of these species were discussed.

Dr P. FERGUSON and Dr J.A. LEE (Manchester): "Sulphur pollutants and the growth of Sphagnum species in the Southern Pennines."

The disappearance of Sphagnum species from the blanket bogs of the Southern Pennines has occurred during the last 200 years. Several factors may have been responsible for this, but atmospheric pollution is a probable cause. Experimental fumigations of several Sphagnum species with SO₂ have demonstrated that the most abundant species in the region to-day, S. recurvum, is the most resistant to this pollutant and other species formerly abundant, e.g. S. imbricatum and S. tenellum, are very sensitive to it. A similar response has been demonstrated in artificial rain experiments conducted at an unpolluted bog in North Wales with the solution products of SO₂, HSO₃ and --SO₄. These experiments were performed with concentrations of sulphur pollutants within the range of those likely to have occurred in the past in the S. Pennines, and so it is probable that these pollutants have at least contributed to the disappearance of Sphagna there.

Since the clean air acts the levels of sulphur pollutants have fallen dramatically in towns and possibly also in rural areas. Transplants of Sphagna into high watertable sites in the blanket bogs of the S. Pennines still grow very poorly compared with transplants to similar situations in North Wales. The cause of this is still being investigated, and may involve an interaction between present-day atmospheric sulphur and nitrogen pollutants and previously deposited pollutants stored in the peat.

Dr J.H. DICKSON (Glasgow): "Recent additions to the Quaternary moss flora."

Dr H.J.B. BIRKS (Cambridge): "Rare and endangered bryophytes in the British Isles: a case for conservation."

For its size Britain supports one of the richest bryophyte floras in the world, with many Atlantic, Continental, and Arctic or Arctic-Alpine species growing at or near their northern, western, and southern limits respectively. The purposes of nature conservation were discussed. The holistic concept of nature conservation is of little direct use in practical conservation of wildlife. Economic aspects (forestry, agriculture, fisheries water use) frequently conflict with wildlife conservation. The main purpose of nature conservation is cultural, both scientific-educational and aesthetic-recreational.

Within the British bryophyte flora, conservation interests should centre on those species whose survival is currently threatened by the rapid loss of natural and semi-natural habitats in Britain.

Threatened endemic or near-endemic species (6 in total) include Cephalozia hibernica and Herbertus borealis. Threatened rare species (plants with one or a few localities; 61 species) include Seligeria carniolica, Leiocolea rutheana, and Acrobolbus wilsonii. In addition there are 22 locally rare species that appear to be declining, including Homalothecium nitens, Orthodontium gracile, and Orthotrichum obtusifolium.

The present rate of habitat destruction in Britain is such that all natural or semi-natural habitats will have been reduced by at least 50% in the next 20-30 years. Major threats to bryophytes include coastal development, mire drainage, changes in land-use in both the lowlands and the uplands, woodland loss, changes in countryside practices, atmospheric pollution, stream and river pollution, and collecting.

Dr J. PRIDDLE (Bangor): "Bryophytes in Antarctic lakes."

Aquatic mosses are an important element in the benthic vegetation of some nutrient-poor Antarctic freshwater lakes. Studies have been carried out on Calliergon sarmentosum (Wahl.) Kindb. and Drepanocladus cf. aduncus, which dominate the benthos of Moss Lake, Signy Island, South Orkney Islands.

The lake had an extreme irradiance environment in winter, with ice and snow on the surface drastically reducing incoming solar radiation. In spite of this, net O₂ production by the moss community (measured *in situ*) was recorded in August, only two months after midwinter. The moss community was estimated to be above compensation for c. 10 months each year. Laboratory studies confirmed very low compensation irradiances for both species of moss at normal lake temperatures. However, compensation irradiances were greatly increased at higher temperatures, suggesting that the survival of aquatic mosses under low winter irradiances may be attributable partly to very low respiration rates at ambient lake temperatures.

Both species exhibited robust morphologies with large leaves and long internodes. Shoots of terrestrial Calliergon sarmentosum cultured in the lake or submerged in the laboratory also developed this habit. Increased Leaf Area Index of the robust morphology may also be a factor in the survival of mosses in low irradiance conditions but it appears to arise in response to some other stimulus. The growth form of aquatic Calliergon was very plastic, the species forming dense stands of microphyllous stems in shallow water but growing as robust stems intermixed with Drepanocladus in the deeper parts of the lake.

The presence of dense stands of aquatic moss increased habitat diversity in the lake and contrasted with the other major component of the benthos which was an undifferentiated algal 'felt'. Moss stems were colonized by a wide variety of epiphytic algae and attached and free-living microfauna.

Dr S.R. EDWARDS (Manchester): Bryophyte photography."

Photography was considered solely as a means of collecting and recording as much useful information about bryophytes as possible. Although general and habitat shots are certainly valuable, the lecture was restricted to magnifications of x1.0 and higher

because of limited time. The particular value of $x1.0$ as a standard was stressed not only for comparison between slides, but also between slide and moss. It was noted that dry mosses are easily wetted (rather than vice versa), so for comparative purposes a wet shot should always be included.

Having briefly considered the functions and merits of a Single Lens Reflex camera, we looked at the simplest flash and camera set-up which can be carried around as a unit to "hammer bryophytes whilst on the trot". The problems of single-flash photography, such as illuminating very close subjects and reducing contrast, were considered. We then discussed the best kind of lens to use for various magnifications, and the practical problems associated both in the field and indoors.

Photography, particularly in close-up, is the art of compromise. At high magnifications the Depth of Field shrinks dramatically, needing very small apertures; but such apertures cause an overall loss of sharpness due to diffraction. To help decisions to be made, graphs were shown of D.o.F. (against aperture at varying magnifications from $x0.1$ to $x10$) and also of resolution (using the same format). This second graph was primarily designed to read resolution on the ground rather than the film, so that a bryologist could easily see what size cells or spores would be resolved. Examples were shown using *Plagiomnium undulatum* at $x1.0$, where the $15\mu\text{m}$ cells were resolved at wider apertures, but vanished when the lens was stopped down to achieve better D.o.F.. *P. affine*, having cells of $30\text{--}50\mu\text{m}$, can, however, usefully be photographed at smaller apertures.

Being able to measure cell size is obviously useful in identifying mosses from slides, but it was stressed that this wasn't the sole criterion. Several other aspects were considered, such as balancing available light with flash, and using teleconverters for effect, but in particular the use of the 24mm $f/2.8$ wide-angle lens, reversed, for magnification of about $x7.5$, was recommended. The lens should be one of those with "floating elements" to correct aberrations when focussed close. Eight advantages were given for the use of such a lens: 1) short focal length needs fewer tubes; 2) competitive focal length, thus both good and cheap; 3) doubles as wide-angle; 4) almost exactly half 50mm standard lens' length, thus making calculations neater; 5) floating elements give excellent image at about 1:7 (normal closest focus), and reciprocally at about $x7$ when lens reversed; 6) retrofocus design gives good working distance, e.g. 45mm at $x7.5$, which is nearly twice focal length of lens; 7) pupillary magnification (i.e. optical asymmetry) for this kind of lens is generally 2.0, making aperture calculations easier; 8) $f/2.8$ gives much needed extra brightness for focussing.

Our final speaker was Dr S.W. GREENE who, in his Presidential Address, discussed ways in which the Society might develop in the future. This was followed by the annual general meeting (Minutes in Bulletin 40) and, in the evening, by a conversazione during which a number of exhibits were displayed. These included the following.

Mr D.G. Long: Barbula jamesonii and related literature

Dr H.L.K. Whitehouse: Aulacomnium palustre with gemmae in agar culture.

Despite the depressing weather prognosis, the Sunday excursion was bright but cold. Roeburndale Woods, Lancashire (Grid ref. SD6066) were visited first. These are northern mixed deciduous woods lying on Carboniferous shales and sandstones that give a range of neutral to acid soils. The woods were chiefly notable for the luxuriance of the bryophytes. Among the species recorded were: Barbilophozia attenuata, Jungermannia atrovirens, Epipterygium tozeri, and Rhytidiadelphus subpinnatus. After lunch at Ingleton, the wooded ravine of Ling Gill, W. Yorkshire (Grid ref. SD 8078) was visited. Trees of ash, elm, birch and aspen clothe the sides of the ravine which is cut into Carboniferous Limestone. The moist sheltered conditions have resulted in a rich bryophyte flora, among which the following species were recorded: Apometzgeria pubescens, Pedinophyllum interruptum, Hylocomium brevirostre and Seligeria acutifolia. Tortula subulata var. graeffii was found on a wall by the roadside where the cars were parked. Epipterygium tozeri and Rhytidiadelphus subpinnatus were new county records, both for VC 60. I am very grateful to those members who supplied lists of species, particularly for the Roeburndale Woods from which no comprehensive bryophyte list exists. Any further additions would be gratefully received.

A.J.C. MALLOCH

This was an enjoyable and worthwhile meeting and, for his efforts in making it so, the Society is indebted to Dr Malloch. Heavy over-night rain threatened the success of the field excursion but events suggested that even the weather was under control.

M.E. NEWTON

TAXONOMIC WORKSHOP, 1981, THAMES POLYTECHNIC

The eighth Taxonomic Workshop was held on November 28-29 at Thames Polytechnic, London, by kind permission of Mr M.D. Morisetti, head of the School of Biological Sciences. The meeting was well attended, with eighteen participants coming not only from London, Essex, Hampshire and Hertfordshire but from as far afield as Wales, Cheshire, Derbyshire, Hereford, Norfolk and Bristol.

Prof. J.G. Duckett took the morning session and clarified the identification of *Barbularia*, pointing out well-marked field characters as well as distinctive appearances and habitats. Particular attention was paid to distinguishing between confusing pairs of species. Useful hints on technique included chopping leaves to enable flattened pieces to be mounted for observation of cell lengths over nerves.

The afternoon was spent on *Sphagna*. Mr M.O. Hill spoke on the sections of the genus and supplied an illustrated guide for reference. He listed difficulties met with in identification and demonstrated with the microscope features which, to the uninitiated, are not obvious from printed descriptions. These features included variability of papillae on cell walls in some species. A number

of exercises were also set, including the recognition of pore sizes in different species.

The field day in Epping Forest and Balls Park Wood, Herts., produced a fair range of common lowland species. Thus, this latest in the annual series of teach-ins once again proved the need for them and their popularity. Thanks go to Dr P.D. Coker for making all arrangements, and to Mr Hill and Prof. Duckett for generously giving of their time and knowledge.

G.G. GEYMAN

FUTURE MEETINGS OF THE SOCIETY

SPRING FIELD MEETING, 1982, Okehampton, 14 - 21 April

Organizer and Local Secretary : Dr M.C.F. Proctor, Department of Biological Sciences, Hatherly Laboratories, University of Exeter, Prince of Wales Road, Exeter, EX4 4PS [Telephone: Exeter (0392) 77911 ext. 606 (home: Exeter 215903)]

Headquarters: White Hart Hotel, Fore Street, Okehampton, Devon, EX20 1HD [Tel.: Okehampton (0837) 2730] Bed & breakfast £9.50

There are a number of guest houses, including the following:

Mrs P. Bowles, Cranford, 81 Station Road, Okehampton [Tel.: (0837) 2251] B & B £5; B,B & EM £7.50.

Mrs Cousins, 68 Station Road, Okehampton [Tel.: (0837) 3234] (1 double room only). B & B £4.50.

Mrs J.I. Kearon, 1 Fairplace, Okehampton [Tel.: (0837) 3190] B & B £4.25.

Mr and Mrs C. Tancock, Meadow Lea, 65 Station Road, Okehampton [Tel.: (0837) 3200]. B & B approx. £6.

Mr and Mrs R. Tolman, 59 Station Road, Okehampton [Tel.: (0837) 2999]. B & B £5

Accommodation in Okehampton is limited; if need be, some people could stay at hotels in nearby villages, particularly Sticklepath/South Zeal (about 4 miles along the Exeter road).

PROGRAMME: Localities to be visited include the high NW corner of Dartmoor around the West Okement valley and Black Tor Copse (Anastrepta orcadensis, Gymnomitrium crenulatum, G. obtusum, Douinia ovata, Lepidozia cupressina), and neighbouring parts of north Dartmoor; the wooded valley of the Teign near Drewsteignton (Porella pinnata, Jubula hutchinsiae, Grimmia montana); cliff slopes and coastal woods near Hartland and Clovelly; the wooded valley of the Torridge near Torrington. There are a lot of under-worked squares in mid- and west Devon, and the programme will be arranged to provide ample opportunities for 'square-bashing' in these

Intending participants should make their own bookings and write to or telephone the Local Secretary for further details.

SUMMER FIELD MEETING, 1982, Penrith, 28 July - 4 August

Organizer and Local Secretary: Mr Phil. Taylor, 2 Meadowside,
off Sedbergh Road, Kendal, Cumbria. [Tel.: (work) Kendal
24555 - ext. 30].

Headquarters: Edenhall Hotel, Edenhall, Langwathby, nr Penrith,
Cumbria [Tel.: Langwathby (076881) - 454]. B & B £10.15
per person.

Penrith lies in the centre of an exceptionally attractive and geologically varied area. It is ideally placed in the Eden valley to allow access to parts of the Lake District and to the fells to the east. Bryologically less well known than the southern part of the Lake District (indeed, it can be described as a seriously underworked region), this is, nevertheless, an area which is potentially rich in mosses and liverworts, as those who remember the Sedbergh meeting will agree. As such, it can be expected to provide interest for the connoisseur as well as the beginner, while also presenting a timely opportunity to boost much-needed records for the mapping scheme. With Phil Taylor (ecologist with the Lake District National Park Planning Board) as leader, this promises to be a very worthwhile meeting which it is hoped will attract a good attendance. Early booking is recommended and details of accommodation in the area are available from the local secretary. Intending participants should contact him as soon as possible for full details of the programme.

ANNUAL GENERAL MEETING AND PAPER READING MEETING, 1982, Nottingham
24-26 September

Organizer and Local Secretary: Dr J.O. Rieley, Department of
Botany, University of Nottingham, University Park,
Nottingham, NG7 2RD.

Accommodation has been reserved in a hall of residence at Nottingham University. Thus, once again we have the opportunity of all staying together in one hall and it is hoped that as many people as possible will avail themselves of it. While exact figures for 1982 are not yet available, it is expected that the cost of full board will be in the region of £16 to £17 per day inclusive of V.A.T. Full details of the papers to be read on the Saturday, and of the Sunday field excursion, will be given in the next Bulletin. However, it would be a great help to our local secretary in estimating numbers if intending participants would write quite early for booking forms.

I am grateful to Dr Rieley for taking on these responsibilities at very short notice. The proposed venue at Oxford proved costlier than I thought members would wish.

TAXONOMIC WORKSHOP, 1982, Bradford, 27-28 November

This will be held at Bradford University, Dr M.R.D. Seaward (Post graduate School of Studies in Environmental Science, University of Bradford, BD7 1DP) having agreed to act as local secretary. Full details of the topics to be dealt with will be given in the next Bulletin.

SPRING FIELD MEETING, 1983

It is proposed that Ilkley or Skipton might be welcomed as centres by members. Mr T. Blockeel would agree to act as local secretary.

SUMMER FIELD MEETING, 1983

A fortnight in Ireland is proposed for consideration.

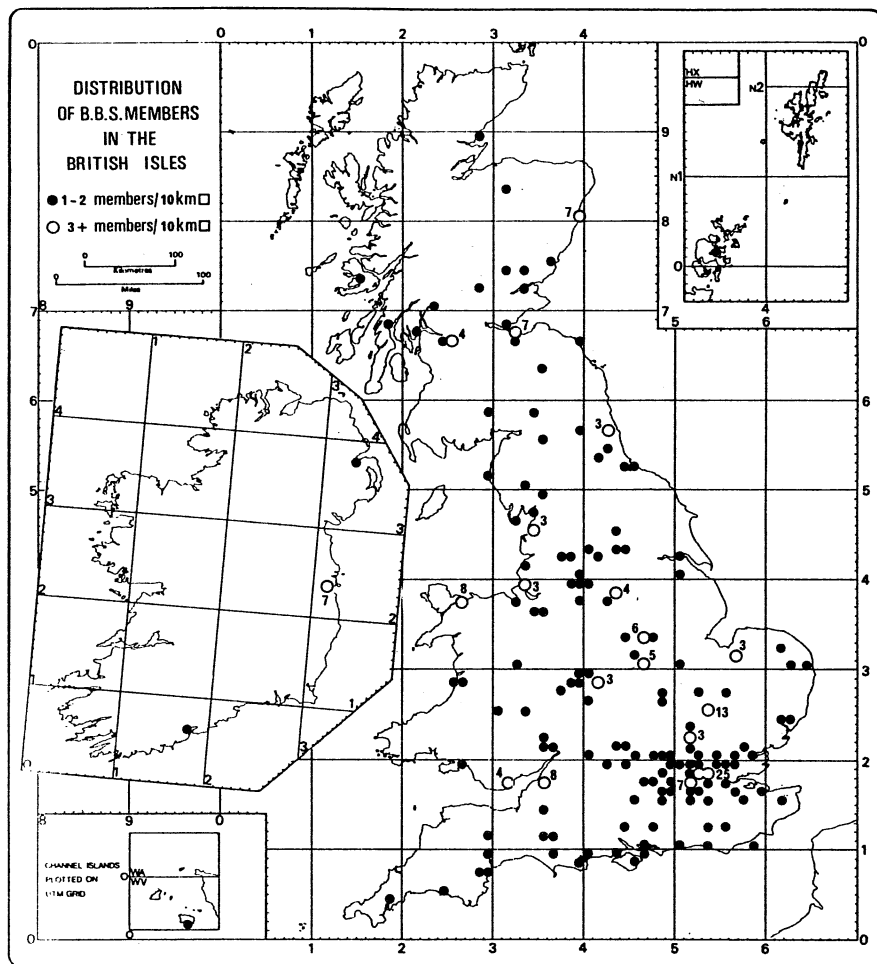
THE JUBILEE MEETING, 1983

Sixty years of bryological activity will be celebrated when the Society holds its jubilee meeting in the autumn of 1983. Commemoration of the Society's foundation in 1923 is planned to coincide with the annual general meeting and paper reading meeting which, in 1983, it is planned to hold in London. Speakers will be invited to contribute especially significant papers, and the Sunday field excursion will be particularly appropriate to the occasion.

A NEW SERIES OF LOCAL MEETINGS

It might be suggested that the success of a society and the benefits obtained by its members are synonymous and depend on an interaction of ideas. If so, then meetings must be central to a society's activities. Many B.B.S. members would agree with this point of view, and it is for this reason that an attempt is made to spread the now well-established annual programme of meetings as evenly as possible over the British Isles. Nevertheless, it is undoubtedly true that the cost of travelling to far-flung meetings makes it increasingly difficult to attend as many B.B.S. meetings as one might wish. Time must also be a limiting factor in some cases. Aware of these problems, Council hopes that by launching a new system of local meetings it will enable many more of us to meet each other and, in doing so, to compile useful records for the mapping scheme. The success of these meetings will depend entirely on the response we, as members, are prepared to make but we can all expect to benefit by participating.

Initially, only a few areas are covered. They are ones in which the stimulus exerted by mapping needs would appear to be strong. Someone living in or near each of these areas has kindly agreed to act as a local organizer, whom anyone interested should contact as soon as possible with an outline of the time and transport at his disposal and enclosing a stamped addressed envelope. Each organizer will then arrange one- or half-day meetings taking into account the interests and commitments of the members concerned. The following are details of the present list of organizers but the meetings secretary would be happy to hear from anyone wishing to extend the idea to other areas. Further details could then be published in the next Bulletin. As it is clearly shown by the latest situation map of bryophyte recording in Britain and Ireland (J. Bryol. 11:169), many other areas are still under-recorded. Even without the stimulus of recording for the mapping scheme, however, local meetings can be highly rewarding. Local organizers might find the accompanying map, prepared by Dr Adams and Mr Geyman, showing the distribution of B.B.S. members, useful when trying to decide on a venue.



The distribution of the 308 members of the British Bryological Society resident in the British Isles, according to mailing address, plotted on a 10km square basis as at 31st December 1981.

K. J. Adams & G. G. Geyman

ASHBOURNE AND BELPER REGIONS OF DERBYSHIRE. Local organizer:
Mr M.A. Pearman, Norman House, Beeley, Matlock, Derbyshire,
DE4 2NU. Date: Saturday 13 March, with other meetings to
follow. Please contact Mr Pearman for dates.

BERKSHIRE AND OXFORDSHIRE AROUND ABINGDON. Local organizer:
Mr G. Bloom, 15 Tatham Road, Abingdon, Oxon, OX14 1QB
Tel. Abingdon (0235) 26893. Dates: to be arranged.

CUMBERLAND IN VICINITY OF WHITEHAVEN. Local organizer: Mr C.Haworth,
5 Standings Rise, Whitehaven, Cumbria, CA28 6SX. Dates: to be
arranged.

VICINITY OF DERBY. Local organizer: Miss P.A. Henley,
14 Harrimans Drive, Breaston, Derby, DE7 3AL. Dates: to be
arranged.

FAIRFORD AND CRICKLADE, N. OF SWINDON. Local organizer:
Mr M.F.V. Corley, Pucketty Farm Cottage, Faringdon, Oxon,
SN7 8JP. Date: Saturday 20 February.

SW OF HEREFORD (Grid square SO(32) 33). Local organizer:
Mr A.R. Perry (Départment of Botany, National Museum of
Wales, Cardiff, CF1 3NP. Tel. Cardiff (0222) 397951 ext 267
Dates: to be arranged.

VICINITY OF READING. Local organizer: Mr M.V. Fletcher, 70 South
Street, Reading, Berks. Dates: School holidays and
Saturdays in March.

USK VALLEY, S. OF ABERGAVENNY. Local organizer: Mr. A.R.Perry.
Address and telephone number above. Dates: to be arranged.

WISBECH/KING'S LYNN AREA. Local organizers: Mr R. Stevenson,
57 Tennyson Avenue, King's Lynn, Norfolk and Mr R.P. Libbey,
143 Gaywood Road, King's Lynn, Norfolk, PE30 2QA.
Dates: to be arranged.

YORK. Local organizer: Mr T.L. Blockeel, 20 Heathfield Close,
Bingley, W. Yorks., BD16 4EQ.
Dates: the weekend of 1-2 May, and Saturday 4 September.

M.E. NEWTON

OTHER BRYOLOGICAL MEETINGS, 1982 - 1983

9-14 April, 1982: Mosses and Liverworts. Dr Kery Dalby. The Drapers' Field
Centre, Rhyd-y-creuau, Betws-y-coed, Gwynedd, LL24 0HB

6-8 July, 1982: Experimental Biology of Lichens and Mosses. The Society of
Experimental Biology meeting to be held at Trinity College, Dublin.

The programme is likely to include the following topics:

mosses - morphogenesis; mineral nutrition; reproductive biology; water
relations; animal relationships, etc.

lichens - mineral nutrition; anion uptake; photosynthesis; nitrogen
fixation; animal relationships, etc.

The organizer of the session, Professor D.H.S. Richardson, is seeking
contributed papers and those wishing to take part should complete a pro forma
distributed by The Society of Experimental Biology (Dr M. Black, Botanical
Secretary, Society of Experimental Biology, Dept. of Biology, Queen Elizabeth
College, Camden Hill Road, London W8, U.K.) or write directly to Prof. D.H.S.
Richardson, School of Botany, Trinity College, Dublin 2, Ireland, providing
a title and abstract which should not exceed 50 words.

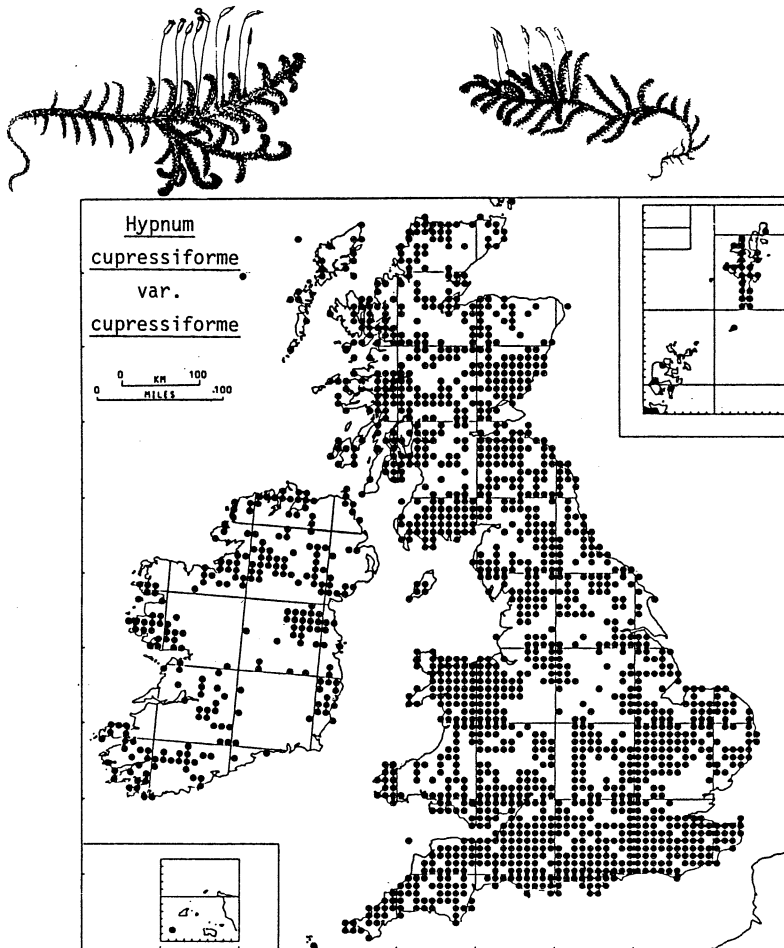
21-28 August, 1982: The Identification and Ecology of Lower Plants. Dr Allan Pentecost. Malham Tarn Field Centre, Settle, Yorkshire, BD24 9PU.

13-19 September, 1982: Mosses and Liverworts. Dr Martha Newton. Preston Montford Field Centre, Montford Bridge, Shrewsbury, SY4 1DX.

22-29 September, 1982: Bryophytes. Brian Brookes. Kindrogan Field Centre, Enochdhu, Blairgowrie, Perthshire, PH10 7PG.

The course at Kindrogan is run by our member Brian Brookes who is the Warden. This course is particularly suitable for beginners. He welcomes individual adults and small groups at Kindrogan, either to participate in advertised courses or on an assisted basis. The fee for the bryophyte course is £85 which is inclusive of board, accommodation and all academic facilities. He would be pleased to provide copies of the full programme and further details of any 1982 courses on request.

22-28 May, 1983: 1st. World Conference in Bryology, Tokyo. International Association of Bryologists. Details from Dr S. Hattori, The Hattori Botanical Laboratory, Obi, Nichinan-shi, Miyazaki-ken 889-25, Japan.



B.B.S. MAPPING SCHEME, 1981

Fewer records were received from unworked squares in 1981 than in 1980 but there were many additional records for under-worked squares. The situation at the end of December 1981 is as follows (data for 1980 in brackets):

<u>Well-worked squares</u>	<u>Under-worked squares</u>	<u>Unworked squares</u>	<u>Total</u>
GT. BRITAIN			
1183 (1162)	1099 (1057)	351 (414)	2633
IRELAND			
74 (72)	339 (329)	534 (546)	947

Information on under-worked areas is given in Bulletin 35.

As there is only until the end of 1982 left for the completion of the present phase of the mapping scheme it would be helpful if members would let me have any record cards that they have. Any lists, even of common species, from under-worked areas will be valuable. The map of Hypnum cupressiforme gives some indication of the degree of cover, based on field records, of common species. Many of the gaps may be filled if lists of common and easily identified species such as H. cupressiforme are forthcoming.

Although the final date for records for the proposed bryophyte atlas is December 1982, it is not intended that recording should cease then. With only 45% of British and 7% of Irish 10 km grid squares well-worked it is intended to continue accumulating records for a possible second edition of the atlas some time in the future.

Further information and record cards (50p for 10 including postage) are available from me.

Dr. A.J.E. Smith, School of Plant Biology, University College of North Wales, Memorial Building, Bangor, Gwynedd, LL57 2UW.

METZGERIA FRUTICULOSA AND M. TEMPERATA

Until recently Metzgeria temperata has not been distinguished from M. fruticulosa (see Paton, 1977, J. Bryol. 9, 441-9) and consequently old field records of M. fruticulosa cannot be accepted for the mapping scheme. I would be grateful, therefore, for confirmed records of M. fruticulosa (even if these have been entered on record cards) and for any herbarium records of M. temperata that have not been put on record cards.

A.J.E. Smith

REFEREES (January,1982)

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

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

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

Hepatic Referees:

- 1,2,15-17,38,53-55,64-67,69: D.G. Long, The Herbarium, Royal Botanic Garden,
Inverleith Row, Edinburgh EH3 5LR
3-10,13,14,18-24,36,37,39-44: T.L. Blockeel, 20 Heathfield Close, Bingley,
W.Yorkshire BD16 4EQ
11,12,58: Mrs J.A. Paton, Fair Rising, Waggs Lane, Probus, Truro, Cornwall
TR2 4JU
25-35,45-47,59-63: M.F.V. Corley, Pucketty Farm Cottage, Faringdon,
Oxfordshire SN7 8JP
48-52,78-86: M.J. Wigginton, Nature Conservancy Council, Calthorpe House,
Calthorpe Street, Banbury, Oxfordshire OX16 8EX
56,57,68,70-74: Prof. J.G. Duckett, Plant Biology & Microbiology, Queen Mary
College, Mile End Road, London E1 4NS
75-77: G. Bloom, 15 Tatham Road, Abingdon, Oxfordshire OX14 1QB

Moss Referees:

- 1: M.O. Hill, Institute of Terrestrial Ecology, Penrhos Road, Bangor,
Gwynedd LL57 2LQ; A. Eddy, Dept. of Botany, British Museum
(Natural History), Cromwell Road, London SW7 5BD
2-10,143: M.O. Hill (address above)
11-36: M.F.V. Corley (address above)
37,38,62-66: Dr A.J.E. Smith, School of Plant Biology, University College
of North Wales, Bangor, Gwynedd LL57 2UW
39,67-81,96-104,106-109,112-138: E.C. Wallace, 2 Strathearn Road, Sutton,
Surrey
40-61: Dr D.F. Chamberlain, Department of Botany, Royal Botanic Garden,
Edinburgh EH3 5LR
82-90,105: Dr E.V. Watson, Little Court, Cleeve, Goring on Thames, Reading,
Berkshire RG8 0DG
91-95: Dr P.D. Coker, School of Biological Sciences, Thames Polytechnic,
Wellington Street, London SE18 6PF
110,111: M.J. Wigginton (address above)
139-142,144-175: Mrs J. Appleyard, Sunnyside, West Horrington, Wells,
Somerset BA5 3ED

A 1964 SAMPLE OF PHILONOTIS MARCHICA FROM SHANKLIN CHINE.

Following a note by C.C. Townsend in a previous issue of this Bulletin (35, p.11,1980) on the occurrence of Philonotis marchica in the Isle of Wight, I have recently received from Mrs J. Appleyard a specimen labelled Philonotis rigida which was collected in Shanklin Chine during the B.B.S. excursion of 1964. I have examined the material and have identified it as P. marchica.

J.H. FIELD

LIBRARY SALES AND SERVICE 1982

Members wishing to borrow books or papers from the library should indicate when a xerographic copy of the appropriate pages would do instead of the original. The current cost of xerox copies is 10p per exposure. The librarian is under no obligation to supply xerox copies but is willing to do so while xeroxing facilities are available.

FOR LOAN:

(a) Approximately 200 bryological books, bryological journals and several thousand offprints of individual papers. A Catalogue to the books and journals is available from the librarian, price 80p.

(b) Transparency collection, list available (S.A.E.). 624 slides in the collection. Loan charge (to cover breakages) 50p plus return postage. Only 50 slides may be borrowed at once to minimise possible loss and damage.

FOR SALE:

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

Transactions of the British Bryological Society/Journal of Bryology:

Vol. 1	parts 1-5 (£1.60 each)	
Vol. 2	parts 1-4 (£3.00 each)	
Vol. 3	parts 1-5 (£3.00 each)	
Vol. 4	part 1 (£3.00), part 2 (£1.50), parts 3-5 (£2.00 each)	
Vol. 5	part 1 (£2.00), parts 2-4 (£3.00 each)	
Vol. 6	part 1 (£3.00), part 2 (£4.00) ends the series of <u>Transactions</u> .	
Vol. 7	parts 1-4 (£2.50 each)	renamed <u>Journal of Bryology</u> .
Vol. 8	parts 1 & 2 (£3.00 each), part 3 (£3.50), part 4 (£5.00)	
Vol. 9	parts 1 & 2 (£4.50 each), parts 3 & 4 (£6.00 each)	
Vol. 10	parts 1 & 2 (£7.00 each), parts 3 & 4 (£8.00 each)	
Vol. 11	part 1 (£8.00), parts 2 & 3 (£10.00 each)	

Census Catalogues:

Duncan, J. B.	Census Catalogue of British Mosses, 2nd edition	1926	(13p)
Sherrin, W. R.	Census Catalogue of British Sphagna.	1946	(5p)
Paton, J. A.	Census Catalogue of British Hepatics, 4th edit.	1965	
	plain (19p), interleaved (22p)		
Warburg, E. F.	Census Catalogue of Mosses, 3rd edition	1963	(19p)
Corley, M. F. V. & Hill, M. O.	Distribution of Bryophytes in the British Isles. A Census Catalogue of their Occurrence in Vice-Counties.		
	1981	price including P & P	(£5.00)

Hand-lenses & Forceps:

Swift x20 handlens Plus leather case (£5.80) Idealtek No:3 forceps (£2.50)

POSTAGE & PACKING EXTRA. Please do not include cash with U.K. orders.

Customers will be invoiced for the correct amount including P. & P. with goods to minimise correspondence.

All the above items are available from the B.B.S. Librarian:

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

A B.B.S. PROJECT ON REPRODUCTIVE BIOLOGY OF
SELECTED BRITISH MOSSES

Introduction

It was announced in B.B.S. Bulletin 37 (March, 1981) that Council is keen to encourage bryological research projects involving a substantial number of participants, including amateur and junior members. Such a project, outlined here, is on aspects of the reproductive biology of British mosses. Comparable proposals in the past (Richards, 1947)) have generally received only limited support. The present note, together with the distribution of a recording card and instructions with this issue of the Bulletin, is designed to demonstrate that information of considerable scientific interest can be accumulated through simple field observation and sampling by the B.B.S. membership in general, combined with critical examination of the resulting specimens by a small team of experienced bryologists. The basic procedure during field observations will involve simply locating populations of the species selected for study, recording basic data on locality, habitat and the presence or absence of sporophytes, and collecting a sample. Topics which may be investigated by this approach include seasonal aspects of reproductive development, and relationships between sex distribution and sporophyte production in species which are seldom encountered in fruit. These matters are of importance, as the frequency of sexual reproduction may have a significant influence on evolution, variation, and therefore on the taxonomy, of the organisms concerned.

Approximately 20% of species in the British moss flora have not been recorded in fruit in Britain, and sporophytes are rare in a further 25%. As Gemmell (1950) pointed out, the majority of these species are dioecious, and in several cases it has been shown that rarity of sporophytes results from antheridia and archegonia seldom developing in the same colony. For example, in Pleurozium schreberi plants bearing archegonia are widespread and common but antheridia are rare over much of southern Britain and capsules develop only where they occur close to archegonia. In contrast, male and female plants, and sporophytes, are relatively common in the Scottish Highlands (Longton and Greene, 1969). Few species have been investigated in this respect, although it is known that Atrichum crispum (Smith, 1978) and some other non-fruiting species develop gametangia of only one sex in the British Isles. Little is known of the effectiveness of spores at germinating and giving rise to a new generation of gametophytes, even in species which fruit freely, and therefore observations on methods of colonization by bryophytes would be of great interest. Fertility in bryophytes, and its implications for variation and evolution, are discussed more fully by Longton (1976).

The studies of Greene (1960), van der Wijk (1960) and more recent workers have demonstrated that gametangia and sporophytes in several mosses undergo clearly defined seasonal cycles of development, though with minor variation in response to local climatic differences. Other bryologists have begun to investigate the factors which control the cycles (Benson-Evans, 1961; Newton, 1972). It is clear from the relatively few mosses studied that the seasonal cycles vary widely between species. For example in Mnium hornum, fertilization during spring and summer is followed rapidly by the early stages of sporophyte development, with setal elongation occurring during autumn. Swelling of the capsule is delayed until the following March, with dehiscence during April and May. In contrast, sporophytes of Brachythecium rutabulum show no comparable arrest in development following setal elongation, the spores being shed in December and January (Greene, 1960). Moreover, van der Wijk (1960) notes that sporophyte development may occur haphazardly throughout the year in a few species, although the details have not been established.

There is thus considerable scope for expanding our knowledge concerning variation in reproductive phenology among mosses, a process which may lead to greater understanding of the adaptive and other significance of the seasonal patterns.

Study Species

The following are examples of species which pose a variety of questions amenable to investigation. In no case has the seasonal reproductive cycle been adequately documented. All are sufficiently common that the requisite sampling will not endanger the populations.

Bryum argenteum

This common dioecious species is cited by van der Wijk (1960) as an example of a moss in which sporophyte development occurs irregularly, in contrast to the normal, clearly defined seasonal pattern. In addition to sporophytes, it produces bulbils in many areas. According to During (1979) these occur primarily in young colonies before sexual reproduction begins, but bulbils are seldom mentioned in the British literature (cf. Smith, 1978). Among questions which the present study may answer are: 1. What is the pattern and degree of variation in reproductive phenology? 2. Do bulbils occur in British populations and if so what is their distribution and relationship to sporophyte production?

Drepanocladus revolvens

This is a widely distributed species of fens, flushes and other rich mires, but sporophytes are rare. It occurs as a large, red, usually autoecious form, and a smaller, green, usually dioecious form. The latter is commonly recognized as var. intermedius, but not by Smith (1978) because of the frequency of intermediates. Substantial variation has also been recorded in chromosome number. Obvious questions here are: 1. What is the degree of correlation between reproductive system, chromosome number and morphology? 2. What is the relative frequency of extreme and intermediate forms? 3. What are the reasons for the rarity of sporophytes, particularly in autoecious populations? Cultivation and cytological studies will be necessary here.

Hylocomium splendens

A widespread and often abundant dioecious species, H. splendens is often regarded as very rarely fruiting in the British Isles (e.g. Smith, 1978). I suspect, however, that sporophytes may not be uncommon in parts of the north and west, as in the ecologically related moss Pleurozium schreberi. Apart from elucidating the seasonal reproductive cycle it would be of great interest to determine: 1. The frequency and distribution of fruiting colonies. 2. The relationship between sporophyte production and the distribution of male and female gametangia.

Hypnum lindbergii

Though seldom abundant, this dioecious species is widespread throughout much of the British Isles, occurring in at least 122 vice-counties. Sporophytes are unknown from the British Isles, although they are not uncommon in parts of Scandinavia and North America. It is unusual in that most of the mosses not known to fruit in Britain are of only local occurrence. Questions of interest here include: 1. Are sporophytes genuinely absent or at least very rare in these islands, or more common but overlooked? 2. If they are absent does this arise through the occurrence here of plants of only one sex, as is the case in some of the less common species, through segregation of males and females into separate colonies, or through other factors?

Tetraphis pellucida

A widespread and often abundant species of rotting wood and peat. T. pellucida is autoecious, and is said to be rare in fruit in the drier parts of Britain but occasional elsewhere (Smith, 1978). Its sporophytes are common in many parts of North America. The combination of monoecious habit and rarity of sporophytes is unusual. It would be interesting to map the distribution of fruiting and non-fruiting populations, and to investigate the reasons for the general rarity of capsules in Britain. 1. Could it be that in dry areas most shoots produce gemmae rather than gametangia at the apex? 2. If so, how is this related to climatic variations? 3. Alternatively, does sporophyte production fail despite production of gametangia, and if so why?

Procedure

The B.B.S. is to undertake a study of reproductive biology of these five species in two phases, firstly field recording and sampling, and secondly a critical examination of specimens from the field sites. It is hoped that many members will participate in the field survey, which will involve completing a recording card and collecting a specimen from each population investigated. In addition to details of locality and habitat, the cards call for information on the presence or absence of sporophytes, on the relative frequency of plants with antheridia and archegonia, on the stages of reproductive development, and on the presence of any colonizing plants. It must be emphasized however, that cards containing only habitat and locality data, and information on the frequency of sporophytes will be of great value, as most of the other information can be obtained from the supporting specimens. Examination of the specimens will be undertaken by the project co-ordinator and a small team of experienced colleagues, who will also undertake the cultivation and cytological studies necessary to address the problems posed by Drepanocladus revolvens.

THUS THERE IS NO REASON WHY ANY B.B.S. MEMBER SHOULD FEEL UNABLE TO PARTICIPATE IN THE PROJECT ON THE GROUNDS OF INSUFFICIENT EXPERTISE. Supplies of recording cards can be obtained from the project co-ordinator, Dr. R.E. Longton, Department of Botany, The University, Reading, RG6 2AS, who will be happy to supply further information, and to discuss any problems that may arise. Field work and examination of specimens will begin in 1982 and continue for three years. It is intended that the results will be analyzed, and written up for publication, during 1985. I am planning to attend the B.B.S. Spring Meeting in 1982 at which I shall be happy to demonstrate the field procedure, and to discuss the project more fully with anyone interested.

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R.E. LONGTON

ERRATUM

MICROSCOPE TECHNIQUES I. BULLETIN 37.

Please note that on page 34 last paragraph a decimal point has been omitted in line 16. It should read:

.....thus one E.P.U. = $200/40 = 5.0\mu\text{m}$.

Any useful tips for inclusion in MICROSCOPE TECHNIQUES II, scheduled for a future Bulletin, would be gratefully received.

KEN ADAMS

A NINETEENTH CENTURY CRYPTOGRAM GARDEN AT CHATSWORTH

M.A.Pearman

The Library, Chatsworth

This anonymous article was originally published in Paxton's Magazine of Botany, vol. 12, 1846, and is worth reprinting for several reasons. First, it continues a theme of local bryological expertise begun in an earlier article in the Bulletin dealing with Robert Scott.¹ Scott worked under Joseph Paxton at Chatsworth as 'Superintendent of the Plant Department in the Large Conservatory' during the 1840's, and from his surviving herbarium sheets was clearly a cryptogamic botanist of considerable skill. He contributed a number of articles to Paxton's Magazine of Botany in the late 1840's and although the authorship of this article cannot be proved it is certainly probable that Scott both conceived and carried out the planting of the bryophytes and lichens at Chatsworth.

Secondly, it is interesting in a more general way to read of such an early attempt at open-air cultivation of bryophytes in this country. The decorative value of mosses as garden plants has long been appreciated

by the Japanese, and much has been written on the subject: the range of species grown is often considerable.² In Britain, however, there is no such tradition of moss gardening, although the Victorian 'moss-houses' briefly described in the Shell Gardens Book³ must have been extraordinary confections and it would be interesting to know more about them. Here, however, we have an account of an established cryptogam garden, containing some 33 mosses, 4 liverworts, 25 lichens and 1 alga, the whole forming a collection which was considered both decorative and educational. The upkeep would have been considerable and must have required the supervision of a competent cryptogamic botanist, so it is likely that the decline of the garden would have coincided with Scott's emigration to India in the late 1850's; certainly no evidence of the collection is visible today.

References

1. FOSTER, W.D. and PEARMAN, M.A. (1981). Scott's mosses - an early nineteenth century bryophyte collection from Chatsworth. Bull. Br. bryol. Soc. 37, 36-8.
2. IWATSUKI, Z. and KODAMA, T. (1961). Mosses in Japanese gardens. Econ. bot. 15, 264-9
3. HUNT, P. (editor) (1964). The Shell gardens book. Phoenix House, London.

LICHEN AND MOSS GARDENS.

It may be questionable whether the various flowers that lend their polished lustre to enamel the parterre, or the minute forms of vegetable life that flourish on the time-worn rock and aged tree, or spread their verdant forms beneath the more luxuriant herbage, are really more capable of affording pleasure to a mind finely strung for the perception of the beautiful in nature. The former are certainly more obtrusive, thrusting their charms more prominently and attractively before the eye of the passing observer; but the wonderful variety, the microscopic minuteness, and beautiful proportion or wayward singularity, of the latter, are assuredly qualities of no mean or contemptible order, and can hardly fail to interest those who once stop to consider and examine them.

Diminutive and insignificant as they may appear, they are far from being a cipher in the utility of the vegetable world. They rise and perish, forming in their decay a soil for the growth of vegetation of a higher order; or, as in the *Sphagnum palustre* and a few others, contributing to the formation of vast morasses, which eventually furnish fuel to many districts. Their production only, or their more flourishing condition, on the northern aspect of the trunks of trees, long answered the purpose of a compass, to the wild untutored Indian, in threading his way through the trackless forests of America: the *Cladonia rangiferina*, or Reindeer Moss, is the sole support for months of the rein-deer in the snow-clad regions of Lapland; and as that animal furnishes the main dependence for food to the inhabitants, this little plant, which bears its name, may thus be said to preserve the lives of thousands of our fellow-creatures. Others, again, as the

Cetraria islandica, or Iceland Moss, are useful for their medicinal properties ; or in the arts and manufactures, as the *Roccella tinctoria*, or Canary-weed, which yields the dye known as Orchill, employed to give the purple tint to blue broad-cloth ; and why should not the culturist also claim an interest in them, and bring them beneath the play of his art ? There is no class of the vegetable race—

“From giant Oaks that wave their branches dark,
To the dwarf Moss that clings upon their bark,”

and the grey Lichens that spread

“Round the dark roots, rent bark, and shattered boughs,”

but is capable of lending a heightening touch to a garden scene, or improving the interest of some retired nook.

By far the larger number of the Mosses and Lichens yet discovered will exist in our own climate : hence an extensive and varied collection might easily be brought together. Mosses are, perhaps, the most beautiful and varied of all the cryptogamic race of plants ; yet there are few places where these have been deemed significant enough for any other purpose in a garden than for packing, for affording protection to other plants from frost or drought, for concealing pots within a vase, or similar uses. Now, if they are sufficiently beautiful, (and who will say they are not ?) for surfacing over the pots sunk in vases in the pleasure-ground, and even for the flower-stand in the drawing-room, why should they not also be separately cultivated in other places in the garden, that are denuded of ornament ? Most people who take any pleasure at all in the vegetable creation, will be delighted with the green verdure of a mossy carpet in a moist plantation, or when enveloping the arms of some fading forest-tree, or spreading over the rocks and stones beneath it ; and we can readily conceive it possible to transfer the same features to the garden, preserving each kind in masses with its proper name. The creation of such plots would give an impetus to the study of these really elegant plants, which we believe are only neglected from their escaping observation amid the profusion of more luxuriant forms, whilst the preservation of their names would lead to a more careful investigation, and an easy recognition of their distinguishing traits.

Something of this kind we have attempted in the pleasure-grounds at Chatsworth, with success, in the vicinity, and partly upon a portion, of the extensive artificial rockeries lately formed near the great stove conservatory. This station affords sites of various character, admitting of some adaptation in the disposal of the species to the natural localities which each delight in. A small lake, which occupies the hollow inclosed amongst the rocky mounds, increases the suitableness of the place, and creates a more extensive diversity of situation. Here the Mosses are planted in broad patches of from one to two feet across, each patch being entirely composed of one species only. We have not attempted any botanical arrangement of the different families or species ; but have sought rather to produce

the most pleasing effect consistent with the necessary provision for securing a *locale* according with that in which each species is found flourishing most luxuriantly in its wild state.

It must not be imagined from this that we condemn the idea of forming a botanically arranged garden of Mosses and Lichens: such a scheme would be highly commendable. It would place in immediate proximity those species that most nearly approach each other in essential character, and greatly facilitate the acquirement of a knowledge of them, and of their several and relative distinctions. But we can only suggest the plan,—we must leave it to the consideration of those who have the management of botanic gardens.

Besides observing the peculiar kind of situation which Mosses and Lichens usually occupy, the substance upon which they grow best should be attended to. Some of the Mosses and Liverworts, and many of the Lichens, are naturally parasitical, or, at least, epiphytal; others grow amongst gravel and upon stones. This is a point of some moment. In forming the collection at Chatsworth, immediate effect was aimed at; hence we have in all cases brought as much of the substance (whether wood, stone, or earth) upon which the plants originally grew, as was thought necessary to ensure their success. Many of the Lichens we have procured are growing on the arms of decaying trees, some of which are eight or ten feet long, whilst the rocks upon which other species flourish have been split into pieces, with from one to four square feet of surface.

Most of the Mosses being shade-loving plants, we have favoured them with a station on the face of a bank having a northern exposure, where the rocks and overshadowing trees protect them still more fully from the rays of the sun. The Lichens being less completely plants of shade, are set in more exposed places. The advantages of shade to those species that need it most, might be yet more perfectly secured, by planting a few of the small-growing Ferns upon the rocks, disposing them in such a manner that whilst they assist in subduing the light, they may not conceal or otherwise interfere with the Mosses and Lichens. Such species as *Adiantum capillus veneris*, (maidenhair), *Trichomanes brevisetum*, (bristle-fern), *Woodsia hyperborea*, and *W. ilvensis*, and any of the Aspleniums, (spleenworts), would be eminently appropriate. The *Hymenophyllum Tunbridgensc* and *H. Wilsoni*, (filmy ferns), *Ophioglossum vulgatum*, (adder's tongue), *Botrychium lunaria*, (moonwort), and the Lycopodiums, (club-mosses), might also be admitted.

The following list comprises most of the species which have already succeeded, with the kind of situation they usually inhabit. Those marked with an asterisk are considered the most handsome.

MUSCI. Mosses.
Bryum argenteum, on walls, and on the ground.
 „ *ligulatum*,* moist banks.
 „ *punctatum*,* boggy places, and rocky streams.

Bryum rostratum, mountains in moist places.
 „ *turbinatum*, wet stony places.
Dicranum heteromallum,* sandy banks.
 „ *scoparium*,* woods and banks.
Didymodon purpureus, moist rocks.

Grimmia pulvinatum, walls and housetops.
Hypnum alopecurum,* woods and shady banks.
 " *cupressiforme*, trunks of trees.
 " *cuspidatum*, bogs.
 " *dendroides*, woods and bogs.
 " *lorcum*, woods and heaths.
 " *molluscum*, among stones.
 " *polymorphum*, limestone rocks.
 " *proliferum*, woods and banks.
 " *purum*, do.
 " *sericeum*, trees and rocks.
 " *serpens*, trees and moist ground.
 " *splendens*,* heaths and banks.
 " *squarrosum*, woods and heaths.
 " *triquetrum*, woods and banks.
Neckera crispa,* trees and rocks.
 " *pumila*, woods.
Orthotrichum crispum, trees and stones.
 " *rupicola*, rocks and walls.
 " *striatum*, trees.
Polytrichum aloides, moist sandy banks.
 " *commune*,* heaths and woods.
 " *undulatum*, moist banks.
 " *piliferum*,* heathy places.
Trichostomum canescens, heaths.

HEPATICE. *Liverworts.*

Jungermannia asplenoides, moist woods.
 " *bidentata*, moist places.
 " *platyphylla*, old walls.
Marchantia hemisphærica, moist banks

LICHENES. *Lichens.*

Borreria furfuracea, decaying trunks of trees.
Cetraria glauca, ground, rocks, and trees.
Cladonia rangiferina, moors and heaths.
 " *uncialis*, do.
Evernia prunastri, trunks of trees.
Gyrophora polyphylla, mountain rocks.
Isidium paradoxum, do.
Lecanora ventosum, do.
 " *Parella*, do.
Lecidea confluens, do.
 " *geographica*, do.
Parmelia olivacea, rocks and trees.
 " *parietina*, walls and trees.
 " *physodes*, stones and trees.
 " *saxatilis*, do.
Ramalina fastigiata, trunks of trees.
 " *fraxinea*, old trees, oak and ash.
Scyphophorus cocciferus, moors and heaths.
 " *fimbriatus*, do.
 " *filiformis*, woods and heaths.
 " *radiatus*, ground.
Sphaerophoron coralloides, rocks.
Usnea florida, old trees.

ALGÆ.

Conferva agagropila,* a singular production, of a globular form, found loose in lakes, commonly called Moor or Moss-balls; very rare.

Besides these we have several others yet unnamed, or in small quantity.

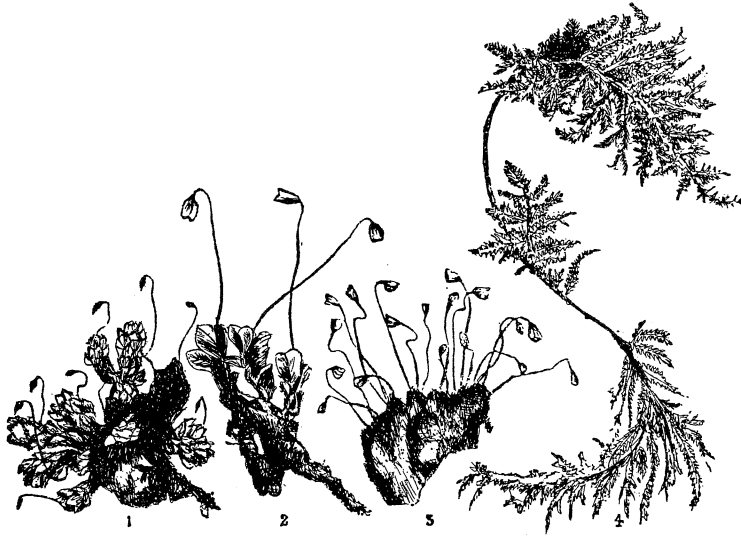
We subjoin the names of a few of the more handsome species, some of which, however, can only be met with in highland districts; but as parties are engaged in collecting, they will doubtless be as easily procured as any other plant:—*Bartramia fontinalis*, *ilhyphylla*; *Conostomum boreale*; *Dicranum Starkii*; *Didymodon Bruntoni*, *flexifolius*; *Fontinalis antipyretica*; *Hypnum cordifolium*, *crista castrensis*, *denticulatum*, *fluitans*, *nitens*, *palustre*, *rugulosum*, *stellatum*; *Jungermannia albicans*, *ciliaris*, *emarginata*, *juniperina*, *nemorosa*, *trilobata*; *Marchantia conica*; *Peltidea canina*; *Scyphophorus gracilis*; *Sticta scrobiculata*.

We might swell out this list with many more beautiful things, but these are sufficient for the present. Those kinds which are not easily obtained in quantity might possibly be reared by shedding the sporules (seeds) in situations similar to those which they naturally occupy. Some species, however, would require a long time to arrive at perfection in this way; and few of the rare species produce capsules freely.

A very small space would be sufficient for the management of a numerous collection, and most gardens possess a suitable shady nook. All that would be required, would be merely a few yards of a bank having a northern aspect, pro-

vided with bog, binding gravel, shale, a few decaying logs, and branches of trees, some rough pieces of limestone, tufa, freestone, and other stone convenient to the place, the more time-worn the better ; and a ditch, or large cistern of water, so that a portion of the plot might be half inundated and the rest readily supplied with moisture. If a small stream of water could be conveyed from a sufficient elevation in pipes to the top of the bank, and allowed to play through a fan-rose, it would be still more suitable. Ferns, heaths, and native 'orchidaceæ would serve to connect such a spot with the flower-garden.

Perhaps some of the finest and rarer species might be suitably accommodated in a moderately capacious Wardian or other plant-case, with orchidaceæ suspended in the upper portion. They would thus be capable of ministering to the enjoyment of townspeople, who have no other convenience for managing vegetable forms.



The species represented in the wood-cut are, No. 1. *Hookeria lucens*, a pretty bright-green Moss, inhabiting damp places : 2. *Bryum punctatum*, a Moss with handsome broad foliage, usually found by the side of rills and in other moist situations, or decaying wood ; 3. *Funaria hygrometrica*, a common plant, remarkable on account of the gyrating faculty of the seta, when touched with a drop of water—in dry weather the seta becomes twisted ; 4. *Hypnum proliferum*, one of the handsomest of the Feather Mosses, either viewed singly, or as it grows in large patches, and found in almost every part of the world.

Notes on the distribution and ecology of Rhizomnium magnifolium
(Horikawa) Koponen in Scotland

D.G.LONG

(Royal Botanic Garden, Edinburgh)

1. Distribution

Rhizomnium magnifolium was reported as new to Britain by Crundwell (1978), from two localities (Angus and E.Inverness) in the Scottish Highlands. Mnium punctatum var. elatum Schimper was included as a synonym; this had been formerly widely recorded in Britain: for example Duncan (1926) listed twelve vice-counties, but according to Crundwell (l.c.) 'Most plants so named have been merely luxuriant forms of Rhizomnium punctatum, but it is likely that a herbarium search will show that it has been collected in Britain from other localities.' Similarly, Smith (1978) described it as '....very rare. Aberdeen, Inverness' (the former in error for Angus). Since 1978 two further records have been published from N.Aberdeen and W.Inverness (Hill 1979, 1981).

During the BBS summer meeting in 1981 the moss was rather unexpectedly found in six new localities, and in a further two since then, discoveries which prompted me to investigate old specimens of M. punctatum var. elatum in BM, E, MANCH, BBSUK and NMW, and D.M.Synnott those in DBN. The list below incorporates all records known at present.

MID-PERTH v.c. 88: bog near summit of Craig Chailleach, 29 vii 1899, W.E. Nicholson, H.N.Dixon & E.S. Salmon (BM); Ben More, 3250 ft, vii 1905, A.Wilson & J.A.Wheldon (DBN, E, NMW); near Killin, vii 1927, W. Young (BM, BBSUK); Croban, Killin, vii 1927, J.B.Duncan (BBSUK); Cam Chreag, Killin, vii 1927, J.B.Duncan (BBSUK, E); Meall Ghaordie, vii 1927, J.B.Duncan (BBSUK, E); N-facing cliffs of Meall na Samhna, Glen Lochay, 31 vii 1981, D.M. Synnott (DBN); near summit of Meall Ghaordie, 850 m, 2 viii 1981, D.G.Long 9827 (E); Stuchd an Lochain, Glen Lyon, 850 m, 22 viii 1981, D.G.Long 9911, 9923 (E); NE. ridge of Ben Lawers, above Lochan nan Cat, 885 m, 26 ix 1981, D.G. Long, C. Geddes & A.G. Payne 9996 (E).

ANGUS v.c. 90: swamps above Glen Dole, Clova, vii 1868, G.E. Hunt (BM); Canlochan Glen, 13 vii 1868, G.E.Hunt (BM); Caenlochan, Glen Isla, vii 1945, U.K. Duncan (E); beside stream on N. side of Caenlochan Glen, 915 m, 30 vii 1977, A.C. Crundwell (GL) fide Crundwell (1978); ibid, vii 1979, C.C. Townsend (herb. CCT) fide Townsend in litt.; above Glen Doll, Clova, c. 750 m, 21 vii 1979, C.C. Townsend 79/271 (herb. CCT) fide Townsend in litt.

NORTH ABERDEEN v.c.93: Buck of Cabrach, 550 m, 1978, R.Richter (BBSUK) fide Hill (1979).

BANFF v.c 94: Feith Buidhe waterfall above Loch Avon, 1020 m, 25 vii 1981, D.M. Synnott (BBSUK) fide Synnott in litt.

EASTERNESS v.c 96: in gully above Loch Tuill Bhearnach, Sgurr na Lapaich, 880 m, 3 vi 1960, A.C. Crundwell (GL) fide Crundwell (1978); W. side of Carn Ban More, Glen Feshie, 14 vii 1975,

C.C. Townsend 75/1048 (herb. CCT) fide Townsend in litt.; Coire Garbhloch, Glen Feshie, 840 m, 26 vii 1981, D.G. Long 9717 (E).

WESTERNESS v.c 97: Ben Nevis, 3000 ft, 12 viii 1880, W. West (BM); Ben Nevis, viii 1909, H.H. Knight & D.A. Jones (DBN, E, NMW); Allt Mhainisteir, Ardverikie Forest, 420 m, 1980, J.A. Paton (BBSUK) fide Hill (1981); S.-facing cliffs, Moy Corrie, Creag Meagaidh, c. 950 m, 24 vii 1981, D.M. Synnott (DBN, E).

ARGYLL v.c 98: Coire an Lochain, Beinn a' Chreachain, 915 m, 1 viii 1981, D.G. Long 9818 (BBSUK, E).

EAST SUTHERLAND v.c 107: bog near summit of Connimheall, Ben More Assynt, 21 vii 1899, W.E. Nicholson & H.N. Dixon (BM, NMW).

In summary, R. magnifolium is known to have been collected on twenty-seven occasions in twenty localities in eight Scottish vice-counties: 88, 90, 93, 94, 96-98, (107). It was first collected in July 1868, in Clova and Caenlochan Glens, Angus, by G.E. Hunt. As suggested by Crundwell (1978) many old records did in fact refer to R. punctatum, but nevertheless a number were correctly named as var. elatum. Of the twelve vice-counties listed by Duncan (1926), specimens collected prior to that date have not been located from 42, 56, 62, 92 and 96; specimens have been located from 57, 65 and 70 and are wrongly named; records from 88, 90 and 97 are correct whilst that from 108 is correctly named but in error for 107. Additional specimens erroneously named var. elatum have been examined from 48, 59, 68, 69, 73 and 103. It is probable that R. magnifolium will turn out to be widespread in the Scottish Highlands, and should also be looked for in the Lake District and N. Wales.

2. Ecology

Smith (1978) described R. magnifolium as a plant of acidic habitats (in contrast to R. pseudopunctatum), growing on 'damp ground near streams and near areas of late snow-lie in montane habitats'. Crundwell (1978), on the basis of reports from other countries, suggested that the known Scottish habitats might be misrepresentative. Notes made in the field, and associated species contained in herbarium packets do indeed bear out Crundwell's prediction to some extent: in Scotland R. magnifolium grows in a rather wide range of habitats and altitudes. In general these habitats may be divided into two main categories:

i. In high mountain habitats between 850 and 1020 m, R. magnifolium occurs in several quite well-defined habitats, such as a) areas of late snow-lie (e.g. above Loch Avon) in scree constantly irrigated by melt water; b) in sheltered gullies in corries, as on Sgurr na Lapaich and Beinn a' Chreachain; and c) on wet stony ground at the foot of dripping acid cliffs, as on Creag Meagaidh, Meall Ghaordie and Stuchd an Lochain. Habitats b) and c) probably experience snow lying quite late in spring, but not all the year round as in the Cairngorms; in summer they are irrigated by rain water. The recorded associated bryophytes in these habitats are mostly species of wet acid screes and springs: Lophozia opacifolia, Pellia neesiana, Scapania paludosa, S. uliginosa, S. undulata, Bryum pseudotriquetrum, Philonotis fontana, Plagiothecium denticulatum, Pleurozium schreberi, Pohlia ludwigii, P. wahlenbergii var. glacialis,

Polytrichum commune, Rhizomnium punctatum and Sphagnum palustre. In such habitats R. magnifolium sometimes forms quite large almost pure patches; it appears to behave consistently as a calcifuge.

ii. In flush habitats R. magnifolium appears to tolerate a greater variety of conditions from acidic to basic and a greater altitudinal range, from 420 to 915 m. Recorded examples include a) in Caenlochan Glen and Glen Clova, C.C. Townsend (pers.comm.) found it growing with the rare Cratoneuron decipiens, a base-loving species; b) on Ben Lawers and in Coire Garbhloch it grew on wet, mildly basic flushed slopes with Scapania undulata, Tritomaria polita, Bryum pseudotriquetrum, Calliergon sarmentosum, Drepanocladus revolvens, and Fissidens osmundoides; c) in neutral or slightly acidic flushes as on Stuchd an Lochain and Meall na Samhna, both in rather wet places, it was with Diplophyllum albicans, Bryum pseudotriquetrum, Dicranum scoparium, Philonotis fontana, and Pohlia ludwigii, and also nearby in rather drier margins of flushes as more scattered stems amongst a variety of larger species, e.g. Lophocolea cuspidata, Calliergon cuspidatum, Eurhynchium praelongum, Hylacomium splendens, Racomitrium lanuginosum, Rhytidiadelphus squarrosus, R. triquetrum and Thuidium tamariscinum; d) by the Allt Mhainisteir, Ardverikie Forest, R. magnifolium was found at the low altitude of 420 m, as scattered stems mixed with Harpanthus flotowianus on the marshy slope of a steep wooded ravine.

In conclusion, it is clear that R. magnifolium often grows apparently as a calcifuge, but can tolerate neutral to quite basic conditions, particularly at lower altitudes. R. pseudopunctatum, on the other hand is consistently a calcicole, and demands very rich and mire conditions under which R. magnifolium has never been observed.

ACKNOWLEDGMENTS

I am very grateful to C.C. Townsend and in particular D.M. Synnott for providing information on their specimens and to the curators of BM, BBSUK, MANCH and NMW for loan of specimens.

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TRANSACTIONS OF THE BOTANICAL SOCIETY OF EDINBURGH

These *Transactions* are now £5.00 a part trade price with four parts usually making up a volume. Fellows and members of the Botanical Society of Edinburgh may purchase parts for £2.00 but during 1982 this substantial concession has been generously extended to members of the British Bryological Society. All enquiries should be made to Dr Roy Watling, Royal Botanic Garden, Edinburgh EH3 5LR.

Several important floristic bryological papers have been published in these *Transactions*, amongst which are the following:

- Duncan, J.B. (1946). A list of the bryophytes of Berwickshire (Watsonian Vice-county 81). *34*(3), 288-315.
Duncan, U.K. (1960). A survey of the bryophytes and lichens of "The Burn", Kincardine. *39*(1), 62-84.
Paton, J.A. (1973). Hepatic flora of the Shetland Islands. *42*(1), 17-29.
Watson, E.V. (1939). The mosses of Barra, Outer Hebrides. *32*(4), 516-541.

Titles of bryological papers in the *Transactions* have been extracted by Dr Watling and a copy of the list thus produced has been lodged with the B.B.S. Librarian, Dr K.J. Adams.

DUTCH BRYOPHYTE ATLASES

Several members have enquired about the procedure for obtaining copies of the following books which between them provide full-page line drawings of all the Dutch mosses and liverworts (including most of the species found in S.E. England).

- ATLAS VAN DE NEDERLANDSE BLADMOSSEN
3e druk (1978) waarin opgenomen aanvullingen
1 en 2 door J LandwehrDFL 47 (incl: P. & P.)
(This book comprises the original Mossen Atlas published in 1966 together with the 1974 and 1978 supplements bound in a single volume).

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Copies can only be obtained by payment in advance. This can be done most conveniently by obtaining a cheque from your bank for the appropriate amount in DFL., or in the case of Barclays Bank by International Money Order.
Address: BUREAU K.N.N.V., B Hoogenboomlaan 24, 1718 BJ HOOGWOUd, THE NETHERLANDS.

Ken Adams

BRYOPHYTE FLORA OF JERSEY

A few copies of the Bryophyte Flora of Jersey, C.I. (1966) and a greater number of the Supplement to the Flora (1972), are still available from our member Miss E.H. du Feu, 35 Chevalier Road, St Helier, Jersey, C.I. The Flora & Supplement together cost 55p (incl. postage) and the Supplement alone costs 40p (incl. postage).

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MARTIN, M., New York
PETCH, Miss A., West Australia
SMITH, B.M., Lowestoft
SMITH, R.A., Kettering
STEEL, D.T., Eastern By-Pass, Oxford.
WEE, Dr Y.C., Singapore
WILKINS, Paul, Exeter

LETTER TO THE BULLETIN EDITOR

From Mr Long

THE MYSTERIOUS 'N.B.'

In recent articles reporting early bryophyte and lichen collections at Chatsworth by Foster & Pearman (Bull. BBS 37: 36-38, 1981) and Gilbert & Pearman (Bull. BLS 49: 17-18, 1981) some specimens have been reported as collected in Scotland last century by an unknown collector, 'N.B.' Bryologists and lichenologists may be interested to know that 'N.B.' was not a person but a Victorian abbreviation for 'North Britain' ie Scotland. The Victorians it seems disapproved of the name 'Scotland', thus we still have a North British Hotel in Edinburgh and formerly had a North British Railway.-----Yours, etc.

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Edited by

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