

distracting bale of hay enabled unpestered access. The weather allowed good bryology until the middle of the day when rain caused a standing lunch under dripping trees. Its unexpected continuation meant that exploration of some of the open areas was replaced by an afternoon of learned discussions in a camper van!

One section of exposed clay had many mosses, noticeably patched with the pink of young plants of *Bryum pseudotriquetrum*, rare in Kent. Also here were *Bryum dichotomum* (*B. bicolor*), *Dicranella varia*, *Didymodon tophaceus* and *Funaria hygrometrica*. On the peat and pond edges *Physcomitrium pyriforme* was abundant, the massed capsules showing bright green patches in the spring, but somewhat 'washed-out' by December.

The main beaver-influence feature is a small lodge which they built in their first enclosure, essentially a pile of sticks and packed soil with about 10% moss cover at the time of visiting. This was mostly *Barbula convoluta* with small amounts of *Brachythecium rutabulum*, *Bryum rubens* and *Funaria hygrometrica*. A pond edge in this enclosure produced *Leptobryum pyriforme*, not often seen in the wild in this district. The beavers are currently living in a burrow, so apart from small man-made drainage channels cut recently to provide

extra water, there is little sign of any further direct influence. As yet, the cuttings have not attracted colonisation by bryophytes.

On the open fen are reed beds crossed by pathways in varying degrees of wetness. The dominant moss was *Brachythecium rutabulum*, added to at the river edges and in wetter parts by *B. rivulare*. The latter engages in its annoying lowland habit of merging into the former in its alar cell structure. *Kindbergia praelonga* (*Eurhynchium praelongum*), *Leptodictyum riparium*, and *Oxyrrhynchium* (*Eurhynchium*) *hians* were also common.

The woods were generally devoid of epiphytes, just a couple of samples of *Orthotrichum affine* being found. Tree bases in wetter, nicely mossy areas also had *Amblystegium serpens*, *Hypnum cupressiforme*, *Orthotrichum diaphanum* and *Rhynchostegium confertum*. The alder carr was much the same but with a little *Plagiothecium nemorale* and the exciting addition of *Oxyrrhynchium* (*Eurhynchium*) *speciosum*. A river bank under tree shade had a delightful sward containing *O. speciosum* abundantly in fruit, *Pellia endiviifolia* and the slender form of *Cratoneuron filicinum*. This was well worth the slightly intrepid effort needed to cross the river on a plank under a low overhanging tree!

The Border Bryologists, 2005

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Our year's meetings started in their traditional fashion, with an indoor workshop at Ludlow Museum for beginner-bryologists, so that they might learn how to prepare and examine bryophytes by using microscopes. After lunch we went web-browsing on the Museum's

computers, starting from and with the BBS's own site.

The Meteorological Office threatened us with freezing temperatures and a hard frost for our February meeting at **Cother Wood** (SO7546)

near West Malvern on the border of Herefordshire and Worcestershire, but maintained its 49% success-record as the day dawned misty but mild. It even brightened towards lunchtime, and the nearby hills came into view as a weak sun drove off the vapours. Although the southern part of Cother Wood lies in vice-county 37 (Worcestershire), it is nevertheless leased to the Herefordshire Nature Trust, and is also a Site of Special Scientific Interest. Greatest bryological interest lies where the calcareous influence of Silurian bedrock approaches the surface, as in the reserve's sloping field, alongside a muddy track, and in several small, long-abandoned quarries.

An enthusiastic team of eleven set to work compiling a list of about 90 species. The small pasture held large quantities of *Hylocomium splendens*, *Pseudoscleropodium (Scleropodium) purum* and *Rhytidiadelphus triquetrus*, but lime allowed the less robust *Campyliadelphus chrysophyllus*, *Fissidens incurvus* and *Weissia longifolia* var. *angustifolia* to survive on pockets of nearly bare soil. In old quarries nearby, nodding capsules of *F. incurvus* showed that this species far outnumbered colonies of *F. dubius*, *F. taxifolius* and *F. viridulus*. *Didymodon tophaceus*, *Trichostomum brachydontium* and *T. crispulum* also grew on the exposed rock, and pleurocarps included *Eurhynchium* (or *Oxyrrhynchium*, as those in the van now once more say) *schleicheri*, *Rhynchostegium murale* and *Taxiphyllum wissgrillii*. *Leiocolea turbinata* was one of very few liverworts in evidence.

Shallow, disturbed soil by the track offered annuals a chance, and Des Callaghan found *Microbryum curvicolle* (the first record from v.-c. 37 for over 50 years) and *Pottia davalliana* (*Microbryum davallianum*), while John Day pointed out a deadhead of Wood Barley (*Hordehymus europaeus*) nearby. Crossing the vice-comital boundary from 37 into 36 as we moved towards the northern part of Cother Wood, another small abandoned quarry harboured *Anomodon viticulosus* growing (as it often does on the Welsh border) with the liverwort *Porella platyphylla*.

Returning to the cars in West Malvern, *Didymodon nicholsonii* appeared on a tarmac drive.

In March we joined Ray Woods for coffee at the former railway station at Erwood (a habitual trysting place of ours on the Radnorshire side of the Wye valley) before moving a little way up the lane to sheep-walks on the common at **Garreg Gawr** (SO0844). Ray pointed out an uncommon lichen, *Anaptychia ciliaris*, on a sycamore tree by the road before we explored base-rich rocks and soil in a nearby gully. Much *Cirriphyllum (Eurhynchium) crassinervium* grew on shallow soil by the rock, alongside *Isothecium alopecuroides* and smaller quantities of *Pterogonium gracile*. *Rhynchostegiella pumila (Eurhynchium pumilum)* also appeared. Acrocarps included *Fissidens viridulus*, *Philonotis arnellii* and *Schistidium apocarpum s.str.*, and of hepatics, Ray found *Porella arboris-vitae* growing next to *P. platyphylla*.

Emerging from the top of the shaded gully, we picnicked in warm sunshine before looking over closely grazed sheep-runs, where an anthill sprouted *Rhodobryum roseum* and *Lophozia excisa*. Ray found several impressive colonies of the uncommon fern *Polypodium cambricum* on unshaded crags, and confirmed his identification later by finding hairs amongst the sporangia. We also came by numerous colonies of the thallose liverwort *Targionia hypophylla* filling soil-filled crevices on the west-facing rocky buttresses, its sinister-looking purple ventral scales and dark involucre betraying its identity. This liverwort has a mainly Mediterranean distribution, and reaches the northern limit of its range in Britain. On such a beautiful sunny day presaging spring, we readily understood *Targionia's* predilection for the dry, base-rich outcrops around Aberedw, their warmth and shelter vividly contrasting with the snow-clad hills of Breconshire on our southern skyline.

We joined the BBS at Aberystwyth in Ceredigion for April's meeting, but in July, Martin Godfrey, Ralph Martin, Seán O'Leary and Mark Lawley struck out independently again for a week's

exploration of **Mull** off the western coast of Scotland, reconnoitring sites for a projected BBS summer meeting of the future.

We passed our first day of bryology amidst delightful scenery on the island's southern coast at **Carsaig** (NM5321 and NM5421), where a rich mixture of deciduous woodland, streamlets, tracks, boulders and flushes against a backdrop of calcareous greensand cliffs yielded over 150 species. Martin launched our research by discovering *Riccia beyrichiana* on a bank of soil under trees just above the beach near the pier, and Ralph turned up *Cirriphyllum crassinervium* nearby. Large mats of *Pterogonium gracile* clothed many a boulder, alongside *Porella arboris-vitae*, *Plagiobhila spinulosa* and *P. bifaria*. Here too were opportunities to reacquaint ourselves with other liverworts, such as *Frullania teneriffae* and *Harpalejeunea mollerii*, which are common along the western Scottish seaboard, but scarcer over much of the rest of Britain.

We skirted a sandy shore in order to approach the cliffs on the bay's western side, collecting *Scorpidium (Drepanocladus) cossonii* from a flush along our way. The cliffs confirmed their calcareous nature with basiphiles such as *Bryoerythrophyllum ferruginascens*, Hoary Whitlowgrass (*Draba incana*) and Thyme Broomrape (*Orobanche alba*) on steep, mobile soil below the buttresses. The rock itself held *Seligeria recurvata* and a *Schistidium* very like *S. strictum* but with capsules too long relative to their width to perfectly fit descriptions of that species. *Glyphomitrium daviesii* appeared, and Martin came across *Calypogeia azurea* on a boulder below the cliffs, the hand-lens revealing a noticeably bluish tinge to its shoots.

Next day, with continued fine weather, we lost no time in heading for the hills. Rather than follow in the footsteps of previous bryologists, who concentrated on Mull's highest ground on Ben More, we drove round to the eastern side of the island, and walked from the road at Scallastle, soon forsaking a track in order to

follow the Allt an Dubh-coire up to higher ground in **Coire na Circe** and on to the peak of **Dun da Ghaoithe** (NM6736). A hot sun beat down relentlessly as we toiled up steep brakes to the corrie. Stopping to refresh at a waterfall, we noted *Aphanolejeunea microscopica* on a damp rock, with the unmistakable purple shoots of *Pleurozia purpurea* on wet moorland nearby – two more liverworts common enough in the western Highlands, but much less so away from the wettest climes.

Climbing on, some of the rock held evidence of base-enrichment, with the characteristic yellow-green cushions of *Anoetangium aestivum*. *Bartramia ithyphylla* kept it company in one spot, and Seán found *Amphidium lapponicum* new to vice-county 103. *Ditrichum zonatum* became increasingly frequent as we gained higher ground, and further evidence of altitude came near the top of the corrie in the form of *Arctoa fulvella*. The summit heath was jewelled with numerous pale-green colonies of *Conostomum tetragonum*, the symmetrical, pentamerous ranking of its leaves unmistakable when viewed from directly above.

Dun da Ghaoithe, although considerably lower than Ben More, is by a very short head Mull's second highest hill, and the ground around its summit must be much wind-blasted, especially at cooler times of the year, so will probably reward more protracted inspection than the few minutes we gave it. By the time we arrived there, though, we were keener to rest after our hot ascent and take in the view, with sailing boats plying the Sound of Mull far below us, their white trims studding the blue water like tiny clouds in an azure sky, a colourful contrast to the dark basaltic cliffs of Morvern beyond. Our descent into Meall a Choire Mhoir was a noticeably pacier affair than our laboured climb up Coire na Circe had been, but we paused long enough to detect a colony of *Philonotis seriata* in one damp spot.

After Monday's exertions we opted for another day on lower ground, exploring between

Knockvologan (NM3120) and **Traigh Gheal** (NM3417) at the south-western extremity of Mull. A leaflet informed us that this estate of Tireragan is the subject of ‘a Highland Renewal Project promoting conservation, education, research and public enjoyment’. We contented ourselves with the enjoyment part of this enervating package, as we took advantage of a well-constructed and maintained path to walk the three miles or so to the bay at Traigh Gheal.

A Hen Harrier enlivened both our outward and return journeys, and a bog near the path at NM3318 contained beautiful yellow mounds of *Campylopus brevipilus*, whose identity we arrived at later by cutting transverse sections of the leaves and finding no stereid cells on the adaxial side of the median cells. *Cephalozia* cf. *macrostachya* and *Kurzia pauciflora* grew in the bog too, along with *Pleurozia purpurea* and Oblong-leaved Sundew (*Drosera intermedia*) and numerous Pale Butterworts (*Pinguicula lusitanica*) grew alongside the path.

The map promised quite extensive woodland on the approach to Traigh Gheal, but trees proved small and rather few, and therefore not suited for an extensive bryoflora. But we soon put this disappointment behind us – literally – on spying the bay at Traigh Gheal, where pale sand, blue sea, high white clouds and a shroud of grey rocks on the distant horizon defined a scene of wonderful beauty.

After picnicking on the strand-line at the top of the beach, where the ocean had dumped a large tree-trunk, we set to work examining the rocks, blown sand and turf nearby. These supported a predictably calcicolous bryoflora that included *Bryum algovicum* var. *rutbeanum*, *Campyliadelphus chrysophyllus*, *Campylium protensum* (*C. stellatum* var. *protensum*), *Didymodon ferrugineus*, *Ditrichum flexicaule* s.str., *Entodon concinnus* and *Tbuidium delicatulum*, along with the liverworts *Marchesinia mackaii* and *Scapania aspera*, and Thyme Broomrape.

After our leisurely day on the beach, and not wanting to waste the continuing fine weather, the party’s Olympians were ready for further high-altitude action, choosing more ground which we suspected may not have been previously quartered by bryologists. Leaving the car in Glen More, we followed a stream north uphill toward **Coire na Lice Duibhe** (NM5832). From a col, wishing to retain the height so arduously gained, we traversed rather precariously round the steep eastern flank of Corra-bheinn, with the wide green tongue of Glen Cannel stretching for miles far below our feet. Courage was rewarded at one point along our way by a strange form of *Ctenidium molluscum*, and later, searching through its shoots, a few stems of *Trichostomum hibernicum* came to light, its inflated leaf-bases distinguishing this species from *T. tenuirostre* which we also found that day.

We had chosen Coire na Lice Duibhe by inspecting the map, for its close contours and north-easterly aspect suggested we might find hepatic mats, and in this we were not disappointed. *Anastrepta orcadensis* and *Bazgania trilobata* grew among upright shoots of *Herbertus stramineus*, the latter’s characteristic red tints contrasting with the delicate pale beauty of *Mastigophora woodsii* nearby. *Campylopus gracilis* and *Ditrichum zonatum* added muscological interest.

Contouring on round and into **Coire Odhar** (NM5732) on the northern side of Corra-bheinn, we faced a stiff climb to higher ground, watched most of the way by wary deer. *Andreaea alpina*, *Anomobryum julaceum* var. *julaceum*, *Arctoa fulvella* and *Conostomum tetragonum* waited for us near the top. As we savoured the panorama and a refreshing drink, the distant shouts of a shepherd on a neighbouring hill reached us across a vast ocean of calm air.

Descending Corra-bheinn’s south-eastern flank, unusual redness in a colony of *Racomitrium ericoides* on a boulder caused consternation, and

Rhabdoweisia crispata and *Splachnum sphaericum* were new to the card.

Thursday dawned with low cloud, which left us pleased to have enjoyed such a fine previous day on high ground, but also apprehensive about prospects for the next few hours. In the event, we passed a dry morning while exploring the shore of **Loch Ba** (NM5438 and NM5538) near Knock. A local woodsman told us to look out for Sea Eagles, but we saw none, and the wooded slopes above the loch were not to our bryological liking, being largely of birch. However, flushes near the shore and the flood-zone itself yielded over 80 species. A colony of *Ceratodon* cf. *heterophyllus* was of particular interest, its obtuse leaves appearing on a small mound of soil in the flood-zone of the loch. Unfortunately, the plant was sterile, and capsules are needed for certain identification.

Rain closed in at lunchtime, and we drove north to a little wooded gorge of the **Ensay Burn** on Treshnish (NM3548) just south of Calgary, where rocks and trees gave some shelter from the elements. Over 30 species of liverwort went on the card, including *Cahypogeia* cf. *suecica*, *Cephalozia catenulata*, *Nowellia curvifolia* and *Riccardia palmata* from a rotting tree-trunk. *Blepharostoma trichophyllum* and *Trichocolea tomentella* appeared for the only time during the week, whereas *Marchesinia mackaii* turned up on a number of other occasions as well.

Driving back to the south of the island, we admired again the impressive cliffs towering above the Atlantic to the west of Ben More, and felt they would probably make good sport for intrepid bryologists on a BBS meeting.

The rain had cleared by Friday, and we enjoyed another excursion in fine weather along the coast near **Ardtun** (NM3724 and NM3824), off the road to Iona. We chose this stretch of coast because of the presence of sedimentary sandstones, gravels and shales which are here associated with the igneous lavas making up

most of Mull's interior. However, Ardtun's sedimentary rocks seemed to be present only in small quantity, and not noticeably calcareous or base-rich. Even so, two miles of coastline yielded over 130 species, starting with *Amblystegium serpens* var. *salinum* and *Hennediella heimii* on saltmarsh near the village. A steep gully incising the basalt sea-cliff contained *Entosthodon attenuatus*, *Fissidens viridulus*, *Glyphomitrium daviesii*, *Hypnum callicbroum* and *Weissia perssonii*, along with yet more *Marchesinia mackaii*. Peat on the moor behind the cliffs gave us *Cahypogeia sphagnicola*, *Cephalozia catenulata*, *C. connivens*, *Kurzia pauciflora* and *K. trichoclados*, and the apparently ubiquitous *Pleurozia purpurea*.

On our last morning on Mull we had an hour to spare before catching the ferry back to Oban, and passed it exploring a laneside at **Auchnacraig** (NM7330) in the south-east of the island, a little south of the ferry-terminal at Craignure. We went there in order to look for limestone, but instead found *Hedwigia integrifolia* growing beside *H. stellata* on acidic rock. *Orthotrichum striatum* appeared on hazel, and Seán found *Ptilium crista-castrensis* on a shaded bank – a delightful bryological valediction from an island of wild and varied scenery.

Back on home soil, a team of ten met up in October at **Credenhill Park Wood** (SO4544), west of Hereford. The wood, which belongs to the Woodland Trust, is a mixture of planted softwood, standard oak coppice, and more varied deciduous species around an Iron Age fort which crowns the hill. *Oxyrrhynchium* (*Eurhynchium*) *schleicheri* grows there on shallow soil overlying base-rich sandstone, with *Anomodon viticulosus*, *Porella platyphylla* and *Zygodon viridissimus* s.str. on rock nearby. Parts of the woodland are fairly humid, and epiphytes included *Radula complanata*, *Orthotrichum hyelli*, *O. stramineum*, *Syntrichia laevipila*, *Ulota phyllantha* and *Zygodon conoidens*. A damp patch of ground held *Drepanocladus aduncus*, and Jonathan Sleath found *Bryum laevifilum* (*B. subelegans*) growing on a boulder. Lorna Fraser took a *Fossombronina* home

in order to mature the spores, which turned out to belong to *F. pusilla*, the 75th species of a list which considerably increased what was hitherto known of Credenhill's bryoflora.

On a brilliantly sunny November day, our last meeting of the year found us at another Woodland Trust reserve, **Helmeth Hill Wood** (SO4693) to the east of Church Stretton, Shropshire. Much of the reserve is fairly dry oak coppice, and accordingly not noticeably alluring to bryophytes. *Plagiothecium curvifolium* fruited at the base of an oak tree, and Ralph Martin came across *Bryum laevifilum*, with brown filamentous gemmae in the leaf-axils distinguishing it from *B. capillare*. *B. laevifilum* seems to be quite frequent on the Welsh border.

The northern end of Helmeth Wood is noticeably more humid. *Metzgeria fruticulosa* and *Heterocladium flaccidum* (*H. heteropterum* var. *flaccidum*) went on the list, and the banks of a

small stream just outside the reserve provided some additional liverworts, including *Cephalozia bicuspidata* with prolific perianths and *Scapania nemorea* with bunches of beautiful chocolate-brown gemmae. Dan Wrench found *Fissidens pusillus* on a stone by the water.

We emerged from the shade into a sunny pasture, where mortared stonework of a long-abandoned dwelling yielded *Bryoerythrophyllum recurvirostrum*, *Didymodon rigidulus* and *Neckera complanata*. On the western slope of Hope Bowdler Hill above, flushes held *Blindia acuta*, *Fissidens osmundoides*, *Philonotis calcarea*, *P. fontana* and *Scorpidium (Drepanocladus) revolvens*. Several of the party were making their bryological *débuts*, so it mattered little that the bryophytes on show were not rare, and as the last of the afternoon's sunshine flattered the slopes, we would have been content with half of the 100 species that went on the card during our day at Church Stretton.

Research and herbaria

Moss genome-sequencing project

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Since 2004 an international moss genome-sequencing project has been in progress, mainly in the United States, Germany and Great Britain. Whole plants and mature capsules are still needed from any location. The taxa under study at present are *Aphanorrbegma patens* and any species of the genus *Physcomitrium*.

Whether the genome-sequencing project should come to fruition or founder, there will still be a need for such material at the University of

Freiburg, where it will be incorporated into a cryogenically preserved plant tissue collection, which is intended to be permanent.

Because the collection criteria are rather specific, particularly in the case of *in vitro* cultured material, and some species of *Physcomitrium* are rare, details of what is needed and a protocol to avoid the over collection of uncommon specimens, drawn up by Dr D.T. Holyoak, are available from Paul King on request. Please