Recorder for Liverworts, Sam Bosanquet, and Recorder for Mosses, Tom Blockeel, present their annual reports and new vice-county record lists

The liverwort year – 2013

During 2013, 101 liverwort vouchers were verified as representing new or updated vice-county records, although there were two duplicates so the true number of changes was 99. This is less than half of the 2012 total and represents a return to typical levels after a big push to cover under-recorded areas in 2011 and 2012 for the forthcoming bryophyte Atlas. In fact, the Atlas was responsible for another 29 records made in 2012 or before but submitted in 2013, including a bumper haul from Co Down. The 15 specimens sent by Richard Weyl from Co Down **H38** were much the greatest submission from one county. Most of the 8 vouchers from the Outer Hebrides **110**, resulted from an expedition to Hirta by Nick Hodgetts, Ron Porley and Clare Rickerby, though two came from Tristan ap Rheinallt, whilst the 5 from Caithness **109** were collected by Sandy Payne during a survey for Plantlife. Some of the 5 specimens from Co Louth **H31** were collected on the 2012 BBS meeting; others were sent by Maurice Eakin or Jo Denyer. The 4 vouchers from Tom Ottley in East Sussex **14**, 4 from Caernarvonshire **49** collected by Malcolm Watling and Sam Bosanquet, and 4 from Des Callaghan in Cheshire **58** marked other regions of activity. 36 bryologists sent in voucher specimens, which is a slight decrease on the 45 who contributed in 2012, but not as substantial as the overall decline in specimens might suggest. Two other major contributors from a variety of vice-counties were Tom Blockeel, who sent 9 specimens, and David Long, who provided 6.

The liverwort year

The overall number of records made in 2013 may have been lower than in the last couple of years, but there was no loss of quality. What were

The number of records reported in 2013 is as follows:

	2013				2012			
	England	Wales	Scotland	Ireland	England	Wales	Scotland	Ireland
New entries	21	10	18	18	31	23	25	79
Debrackets*	8	1	9	14	18	5	15	25
Bracketings†	–	–	–	–	2	–	–	–
Deletions	–	–	–	–	12	1	1	–
Totals	**29**	**11**	**27**	**32**	**63**	**29**	**41**	**104**

*Debrackets are existing vice-county entries for which a post-1960 record has been vouched. †Bracketings are existing entries for which the post-1960 records are unconfirmed or erroneous, but older record(s) are valid.

reduced were the common 'padders' resulting from visits to under-recorded vice-counties, leaving a selection of high quality rare and scarce species from England, Ireland, Scotland and Wales.

The rarest discovery made in England during the year was *Cephaloziella baumgartneri*, found by John Norton and others on a limestone abbey wall in South Hampshire **11**. Not only is this one of the few recent British records of this calcicole, it is also the first to come from a wall rather than calcareous soil or quarry spoil. Mary Ghullam identified *Pallavicinia lyellii* from an equally unusual habitat in the Broads of East Norfolk **27**: fen hover with the rare fern *Dryopteris cristata* as an associate. Mark Pool found *Kurzia sylvatica* in South Devon **3**, which is only the fourth time this diminutive liverwort has been sent in as a voucher since I took over as Liverwort Recorder. *Lophozia perssonii* was the pick of Tom Ottley's collections from East Sussex **14**, although a debracketting of the declining *Cladopodiella francisci* was also very welcome. Another species that is declining severely in England, *Lophozia incisa*, was found new to Berkshire **22** by Ambroise Baker. The dry summer allowed *Fossombronia foveolata* to appear on a reservoir margin in Upper Wharfedale, Mid-west Yorkshire **64**, whilst *Gymnomitrion crenulatum* was discovered in Upper Teesdale, North-west Yorkshire **65**. The last voucher of the year was one of the most exciting – Sharon Pilkington's *Drepanolejeunea hamatifolia* from a willow in wet woodland in the Mendip Hills, North Somerset **6** – although this is clearly a spreading species and might equally be discussed alongside *Cololejeunea* and *Colura* below.

Pride of place in Wales goes to the *Telaranea europaea* found by Malcolm Watling in Caernarvonshire **49** during a meeting of the North Wales Non-Flowering Plant Group. There is only one other British site, in West Cornwall, and a handful in Ireland. The Cornish site and many of those in Ireland have abundant rhododendron, as does (or did) the Beddgelert area. It seems plausible that rhododendron mimics the deep shade of the Macaronesian Laurel forests that are at the core of this species' range. Also new to Wales was *Odontoschisma elongatum*, discovered during an evening paddling around one of the most beautiful lakes in Snowdonia. Another evening wander, this time along the coast near Criccieth, revealed *Riccia hubeneriana* new to Caernarvonshire **49** in a seasonal pool (Fig. 1), whilst NVC survey work earlier that day had the highlight of Kathryn Birch saying "this can't just be a *Pellia*" about a specimen of *Pallavicinia lyellii* she had just found in a quadrat. Mark Lawley has got his eye in for *Jamesoniella undulifolia* and discovered it new to Radnorshire **43** growing in the same flush complex as that county's first *Scapania paludicola* and some *Barbilophozia kunzeana*. *Targionia hypophylla* has been declining in Wales over recent decades so its rediscovery at a historic locality on Anglesey **52** more than a century since it was last found at that site was exciting (Fig. 2).

Despite last year's surprise discovery of *Radula holtii* in Westerness **97**, it was still amazing when Ben Averis found a second Scottish population, in Talladale, West Ross **105**. Almost as rare was a third Scottish colony of *Leiocolea rutheana*, discovered by Gordon Rothero by the track to Fealar, East Perthshire **89**. Careful checking of liverwort crusts by Tom Ottley resulted in an updated record of *Gymnomitrion apiculatum* from Ben Macdui, South Aberdeenshire **92**; care was also taken to confirm which vice-county the record came from. There are very few Scottish records of *Scapania curta*, and a new site was added by Nick Hodgetts on Skye, North Ebudes

△Fig. 1 (left and right): *Riccia hubeneriana*, in a seasonal pool along the coast near Criccieth. S Bosanquet

104. Five vouchers from Sandy Payne's survey of Munsary Peatlands in Caithness **109** included *Cephalozia loitlesbergeri, C. macrostachya* and *C. pleniceps*. *Cephalozia pleniceps* was also one of the notable species collected from Hirta, St Kilda, Outer Hebrides **110** by Nick Hodgetts, Ron Porley and Clare Rickerby; others were *Harpanthus scutatus, Porella cordaeana, Radula lindenbergiana* and *Cephaloziella integerrima.* This last record was among the most extraordinary range extensions of recent years, because the range of *C. integerrima* was previously limited to southern England and the south coast of Ireland, and only a record from East Donegal **H34** hinted at the species' Boreal-montane distribution in Europe.

The drop in submissions was most pronounced in Ireland, and would have been even more extreme if it had not been for Richard Weyl's 19 specimens from the last several years. These included *Riccia fluitans, Lophocolea fragrans, Porella cordaeana* and *P. pinnata*, as well as various commoner species missed during the 2012 BBS visit. The most outstanding Irish find was Rory Hodd's *Lophozia opacifolia* from Macgillycuddy's Reeks, South Kerry **H1**, which extended its range south by more than 100 km.

The predominance of thallose liverworts noted in previous years was not so apparent in 2013, and there were only eight vouchers of *Marchantia* and five of *Conocephalum*. The usually unpopular genus *Cephalozia* mustered seven vouchers, partly because of Sandy Payne's work in the Flow Country, though *Scapania* only managed five. Overall, taxonomic diversity among the vouchers was impressively high and the 101 specimens represented 80 taxa.

Most of the recently spreading species do not seem to have moved much further during the year: *Colura calyptrifolia* and *Cololejeunea minutissima* were each collected from two vice-counties, consolidating their ranges, whilst *Lophocolea bispinosa* and *L. semiteres* only came from a single vice-county each. However, Julie Smith's *L. semiteres* from near Beauly, Easterness **96** is a northward leap by more than 100 km. *Metzgeria consanguinea* was also found in just a single new vice-county, though West Suffolk **26** is impressively far east for this species and it has yet to be collected in Norfolk. As mentioned above, *Drepanolejeunea hamatifolia* in North Somerset **6** was the most exciting example of range expansion in 2013.

New vice-county records and amendments

Vouchers are deposited in the BBS herbarium (BBSUK) unless otherwise stated. Other herbarium abbreviations are DBN = National Botanic Garden, Glasnevin, Dublin; E = Royal Botanic Garden, Edinburgh.

5.1.a. *Marchantia polymorpha* subsp. *polymorpha*. 16: derelict farm quarry, Hale Street, nr East Peckham, TQ679493, 2013, S Lemon, det. J Hendey; **92**: on sandy bank at edge of river, 140 m alt., River Don at Houghton Country Park, NJ5816, 2011, E Kungu.

5.1.b. *Marchantia polymorpha* subsp. *ruderalis*. 79: on disturbed bank in woodland garden, 175 m alt., lower Hangingshaw Burn, Yarrow Valley, NT39852992, 2013, DG Long & J Smith 42318 (E); **105**: on soil between pavement cracks in courtyard, 20 m alt., Letterewe, NG951713, 2013, O Moore; **106**: gravelly soil on pathside in park, 70 m alt., Strathpeffer, NH483580, 2013, TL Blockeel 42/449; **110**: damp earth in ruined house, 60 m alt., Hirta, Village Bay, NF10149935, 2013, NG Hodgetts, RD Porley & C Rickerby 8327; **110**: crevices between paving stones on terrace, 28 m alt., Urquhart Gardens, Stornoway, NB42313428, 2013, T ap Rheinallt; **H38**: path near edge of lake, 12 m alt., Mountstewart Estate, J552699, R Weyl 265.

9.1. *Conocephalum conicum*. 5: rocks near small waterfall, 180 m alt., Black Down Hills, Hawk's Moor, ST225169, 2013, T Ottley 13111702; **31**: on vertical calcareous clay bank of stream through ancient woodland, 21 m alt., Monks Wood NNR, compartment 26, TL19447976, 2013, M Burton; **H38**: riverbank, 5 m alt., Crawfordsburn Country Park, J4681, R Weyl 27.

9.2. *Conocephalum salebrosum*. 38: on shaded brickwork of lake dam, Bracebridge Pool, Sutton Park, SP09989792, 2013, DA Callaghan; **58**: damp rocky outcrop beside stream in woodland, Flood Brook Clough, SJ53128000, 2013, DA Callaghan.

10.3. *Riccia huebeneriana*. 49: margins of seasonal pool behind shingle bank, 5 m alt., East of Criccieth, SH511380, 2013, SDS Bosanquet (Fig. 1).

10.4. *Riccia fluitans*. H33: lake in cut-over raised bog, 78 m alt., Black Lough, Colebroke Estate, H397454, 2013, R Weyl 250.

10.10. *Riccia subbifurca*. 14: bare sandy soil on bank, 75 m alt., Framfield, Sandy Lane, TQ49392113, 2013, T Ottley 13101901; **58**: soil between paving stones, Newton Park Butterfly Garden, SJ77379008, 2013, DA Callaghan 84; **104**: damp stony track on rocky slope near sea shore, 12 m alt., Mission House, Rona, NG62235808, 2013, DG Long 42493 (E); **104**: moist gritty soil at edge of driveway, 20 m alt., Inverarish, Isle of Raasay, NG555360, 2013, TL Blockeel 42/424.

12.1. *Targionia hypophylla*. 52: soil on tuff outcrop, 60 m alt., above Tan-rallt, Pentraeth, SH516773, 2013, SDS Bosanquet, KS Birch & R Birch (Fig. 2).

16.1. *Fossombronia foveolata*. 64: margin of reservoir, 215 m alt., Barden Lower Reservoir, Wharfdale, SE0356, 2013, M Wilcox.

16.4. *Fossombronia pusilla*. 84: bare soil in pasture, Ochiltree Mill, NT0574, 1975, DG Long (E).

16.6. *Fossombronia wondraczekii*. 109: cattle-puddled earth amongst *Juncus effusus*, Munsary Peatlands, below Munsary Cottage, ND212450, 2013, AG Payne.

16.8. *Fossombronia incurva*. 48: low ridges in dune slack, 5 m alt., Morfa Harlech,

△Fig. 2 (left and right): *Targionia hypophylla,* rediscovered in Anglesey, above Tan-rallt, Pentraeth. P Jones

SH55823491, 2013, SDS Bosanquet.

18.1. *Pallavicinia lyellii*. 27: with *Sphagnum subnitens, Phragmites* and *Dryopteris cristata* on an island formed from fen hover, 2 m alt., Barton Broad, West Barton Turf CP, TG35972155, 2013, J Lester, det. M Ghullam; **49**: tussocky *Molinia* & *Eriophorum* on bog, 85 m alt., Rhosgyll Fawr, SH45424126, 2013, KS Birch.

20.2. *Metzgeria consanguinea*. 26: trunk of Ash, Groton Wood NR, Groton, TL978428, 2013, RJ Fisk.

22.1. *Riccardia multifida*. 39: wet peaty soil in small base-rich mire in boggy field, 330 m alt., near Spouts Farm, Reaps Moor, SK079606, 2013, TL Blockeel 42/007.

22.4. *Riccardia palmata*. H14: in willow woodland, 90 m alt., Abbeyleix Bog, Ballymullen, S438834, 2013, M Eakin (DBN).

22.5. *Riccardia latifrons*. H38: decaying *Sphagnum* hummock on bog, 100 m alt., Lisbane Bog, J3859, R Weyl 080.

23.1. *Porella platyphylla*. H38: ledge on wall of building in courtyard, 4 m alt., Castleward, J573498, R Weyl 126.

23.2. *Porella cordaeana*. 110: dripping rock face in deep shade in N-facing rock outcrop, 110 m alt., Hirta, The Cambir, NA07930042, 2013, NG Hodgetts, RD Porley & C Rickerby 8311; **H38**: rock on river bank, 60 m alt., Ballynahinch river, J372514, 2013, R Weyl 410.

23.5. *Porella pinnata*. H38: stones in river, 18 m alt., Balloo, J499610, R Weyl 125.

24.2. *Radula lindenbergiana*. 110: on peaty soil in rocky declivity on clifftop, 90 m alt., Hirta, Ruabhal, NF09549804, 2013, NG Hodgetts, RD Porley & C Rickerby 8288.

24.4. *Radula holtii*. 105: in wet underhang on almost vertical rock face at west edge of river in wooded ravine, Talladale, NG91646927, 2013, ABG Averis, conf. NG Hodgetts.

25.4. *Frullania fragilifolia*. 40: on rock on crag, The Batch, Long Mynd, SO443955, 2013, M Lawley; **H38**: steep north-facing coastal rocks, 1 m alt., Orlock Point, J5583, R Weyl 048.

28.3. *Cololejeunea minutissima*. 51: on Hazel, 90 m alt., Coed y Cra, SJ222714, JD Shanklin; **H18:** *Salix* bark in conifer plantation, Golden Grove Hill, NW of Roscrea, S116928, GF Smith (DBN).

29.1. *Colura calyptrifolia*. 39: on *Salix* in gully of small stream in open area by conifer plantation, 415 m alt., 0.5km NW of Royal Cottage, Staffordshire Moorlands,

SK02366443, 2013, TL Blockeel 42/656; **60**: on sallow and on spruce twigs in wet ground at edge of plantation, 215 m alt., Brownslow Brook, Longridge Fell, SD66494018, 2013, TL Blockeel 42/307, colony first found by J Allinson.

30.1. *Drepanolejeunea hamatifolia*. 6: on bough of a willow in wet woodland near a stream, 220 m alt., Black Down, Mendip Hills, ST46945777, 2013, SL Pilkington.

32.1. *Lejeunea cavifolia*. H38: rock on river bank, 60 m alt., Ballynahinch river, J372514, 2013, R Weyl 410.

34.1. *Microlejeunea ulicina*. 58: Sycamore on track by reservoir, 165 m alt., north side of Valehouse Reservoir, near Tintwistle, SK035978, 2013, TL Blockeel 42/635.

37.1. *Trichocolea tomentella*. H36: woodland, Corbylin Wood, C4304, 1990, M Bradley 205, det. R Weyl.

40.1. *Bazzania trilobata*. 110: in block scree under a low canopy of *Calluna*, 250 m alt., Hirta, Glacan Conachair, NF09959963, 2013, RD Porley, NG Hodgetts & C Rickerby.

41.1. *Kurzia pauciflora*. H38: decaying *Sphagnum* hummock on bog, 100 m alt., Lisbane Bog, J3859, R Weyl 080.

41.2. *Kurzia sylvatica*. 3: on vertical side of acid bank under Beech trees, 115 m alt., Bystock Local Nature Reserve, Exmouth, SY030845, 2013, M Pool.

41.3. *Kurzia trichoclados*. 109: growing over bare peat with *Campylopus flexuosus* and *Cephalozia connivens* on peaty bank, Munsary Peatlands, ND217450, 2013, AG Payne, conf. TH Blackstock.

42.3. *Lepidozia cupressina*. H36: oak wood, 100 m alt., Drumlea and Mullen Woods, H5587, 1989, NIEA Habitat Survey Team 162, det. R Weyl.

43.1. *Telaranea europaea*. 49: near waterfall in old walled garden, Coed Craflwyn, near Beddgelert, SH600491, 2013, MC Watling, New to Wales.

44.2. *Lophocolea bispinosa*. 14: on wide sandy ride, 165 m alt., Broadstone, Ashdown Forest, TQ437324, 2013, T Ottley 13033101.

44.3. *Lophocolea heterophylla*. H18: rotting conifer log, Golden Grove Hill, NW of Roscrea, S116928, GF Smith (DBN).

44.4. *Lophocolea semiteres*. 96: on fallen deadwood in open conifer plantation, Reilig near Beauly, NH55724305, 2013, JE Smith & D Genney, det. GP Rothero.

44.6. *Lophocolea fragrans*. H38: mixed with other bryophytes on sheltered low rocky bank near river, 5 m alt., Crawfordsburn Country Park, J4681, R Weyl 099.

45.2. *Chiloscyphus pallescens*. H31: on *Sphagnum* in transition mire, 50 m alt., Gallagh Dunleer, O077885, 2013, M Eakin (DBN).

48.2. *Plagiochila porelloides*. 32: on mounds of calcareous clay in woodland, 70 m alt., Eastern Hornstocks Wood, TF013006, 2013, MJ Wigginton 13/001.

48.8. *Plagiochila bifaria*. H38: on north-facing coastal rocks with *Saccogyna* & *Frullania teneriffae*, 2 m alt., Ballyhornan, J577505, 2003, R Weyl 111.

48.9. *Plagiochila punctata*. 41: south-facing rock face in deep hollow of chasm, Daren y Dimbath, SS95318960, 2013, DA Callaghan; **96**: on boulder in mossy block scree, steep-sided ravine, 95 m alt., River Affric gorge below Badger Falls, Glen Affric, NH30272853, 2013, DG Long, GP Rothero & JE Smith 42417 (E).

50.2. *Jamesoniella undulifolia*. 43: amongst *Sphagnum* on hummock in a flush, Carneddau, SO069547, 2013, M Lawley.

52.1. *Cephalozia bicuspidata*. H22: on peat of

cattle hoof mark, 220 m alt., Rathbranchurch, Lobinstown, N933806, 2013, M Eakin (DBN).

52.4.a. *Cephalozia macrostachya* var. *macrostachya*. 109: growing through *Sphagnum capillifolium* hummock on blanket bog, Munsary Peatlands, ND226459, 2013, AG Payne, conf. TH Blackstock.

52.6. *Cephalozia lunulifolia*. 84: bare peat by ditch, on blanket bog, Blawhorn Moss, near Blackridge, NS8868, 1975, DG Long 4700 (E).

52.7. *Cephalozia pleniceps*. 109: growing through *Sphagnum capillifolium* on blanket bog, Munsary Peatlands, ND209457, 2013, AG Payne, conf. TH Blackstock; **110**: in hummock of *Sphagnum subnitens* in flush on NE-facing hillside, 70 m alt., Hirta, Am Blaid, NF09649922, 2013, NG Hodgetts, RD Porley & C Rickerby 8292.

52.8. *Cephalozia loitlesbergeri*. 109: growing through *Sphagnum capillifolium*, Munsary Peatlands, on edge of Munsary Dubh Lochs complex, ND218459, 2013, AG Payne, conf. TH Blackstock.

52.9. *Cephalozia connivens*. H38: raised bog, 62 m alt., Aughndarragh Lough, J485505, R Weyl 21.

53.2. *Cladopodiella francisci*. 14: on wet peat and through decaying *Campylopus introflexus*, 171 m alt., Chelwood, Ashdown Forest, TQ42243039, 2013, T Ottley.

54.1. *Hygrobiella laxifolia*. 41: on flushed rockface in young woodland, 250 m alt., Afon Corrwg, Glyncorrwg, SS88239944, 2013, SL Pilkington.

55.1. *Nowellia curvifolia*. H37: decaying logs on steeply sloping east side of glen, 40 m alt., Clare Glen, J0144, R Weyl 104.

56.3. *Odontoschisma elongatum*. 49: submerged among algae on stony lake edge, 380 m alt., Llyn Cwmffynnon, SH651563, 2013, SDS Bosanquet, New to Wales.

58.4. *Cephaloziella hampeana*. H18: disturbed peat on edge of conifer plantation, Derryounce, Portarlington, N5414, GF Smith (DBN).

58.5. *Cephaloziella baumgartneri*. 11: tall limestone wall in fairly heavy shade, Netley Abbey, Netley, SU45270903, 2013, JA Norton, PA Budd & EJ Clement, conf. DA Callaghan.

58.12. *Cephaloziella integerrima*. 110: acid open ground of quarry floor, with *Nardia scalaris* and *Anomobryum julaceum*, 100 m alt., Hirta, Cnoc a' Bheannaichta, NF09559954, 2013, NG Hodgetts, RD Porley & C Rickerby 8311.

59.1. *Gymnocolea inflata*. H31: Long Woman's Grave, Carlingford Mountain, J13051366, 2010, JL Denyer & SDS Bosanquet JLD_B_4430 (DBN).

60.3. *Barbilophozia floerkei*. H31: gabro boulder, Slievenaglogh, J13850894, JL Denyer & GP Rothero JLD_B_5274 (DBN).

60.4. *Barbilophozia atlantica*. 78: on boulder on slope by stream in upland valley, 310 m alt., lower Gameshope Valley, Tweedsmuir Hills, NT13291991, 2013, DG Long (E).

60.5. *Barbilophozia attenuata*. H22: on volcanic rock exposures, 180 m alt., Broomfield, Collon, N980802, 2013, M Eakin (DBN); **H38**: rock outcrop in woodland, 95 m alt., Bohill, J397461, R Weyl 3.

66.5. *Lophozia sudetica*. H31: in cleft in cliff, Slievenaglogh, J138090, RL Hodd & British Bryological Society (DBN).

66.7. *Lophozia perssonii*. 14: on chalk rocks in scree, 125 m alt., Malling Chalk Pits, Lewes, TQ43091114, 2013, T Ottley 13101801.

66.11. *Lophozia incisa*. 22: mire, Wildmoor NR, SU86L, 2008, A Baker.

66.12. *Lophozia opacifolia*. H1: montane ledge,

777 m alt., Coimin Grin, Macgillycuddy's Reeks, V83188408, 2013, RL Hodd (DBN).

69.6. *Scapania curta*. 104: compacted detritus over old tarmac on old road, with *S irrigua*, 35 m alt., Lyndale House, S of, NG364540, 2013, NG Hodgetts 8364.

69.11. *Scapania nemorea*. 39: millstone grit boulder on bank of stream, 250 m alt., Forest Wood, near Lud's Church, Gradbach, SJ98536597, 2013, TL Blockeel & AJ Hodgson 42/010.

69.12. *Scapania irrigua*. 6: at edge of well-used bridleway on sandstone, 265 m alt., Black Down, Mendip Hills, ST46905743, 2013, SL Pilkington; **H31**: damp gravel, Long Woman's Grave, Carlingford Mountain, J129137, 2010, JL Denyer & SDS Bosanquet JLD_B_4442 (DBN).

69.14. *Scapania paludicola*. 43: base of hummock in a flush, Carneddau, SO066547, 2013, M Lawley.

74.1. *Calypogeia fissa*. 55: on muddy bank, Holly Hayes Wood, Whitwick, SK441155, 2013, SF Woodward SFW089206.

74.6. *Calypogeia sphagnicola*. H38: raised bog, 62 m alt., Aughndarragh Lough, J485505, R Weyl 257.

74.8. *Calypogeia arguta*. H22: soil in woodland, 100 m alt., Littlewood Forest, Littlewood, N970758, 2013, M Eakin (DBN).

75.1.a. *Leiocolea rutheana* var. *rutheana*. 89: in large flush with *Meesia* & *Cinclidium*, 550 m alt., E slopes of Meall Spionaig, above bridge on track to Fealar, NO00837796, 2013, GP Rothero 2013151.

75.7. *Leiocolea badensis*. H38: calcareous fen, 25 m alt., Lough Keelan, J5645, R Weyl 32.

75.8. *Leiocolea turbinata*. 110: on shaded dripping rock wall around well/spring with *Conocephalum* and *Pellia endiviifolia*, Traigh na Beirigh, Uig, Isle of Lewis, NB10803543, 2013, T ap Rheinallt.

78.2. *Jungermannia pumila*. 6: rocks by stream, 220 m alt., East Twin Brook, ST479579, 2013, T Ottley.

82.2. *Harpanthus scutatus*. 110: liverwort-rich spongy turf 'lens' dominated by *Plantago maritima*, 150 m alt., Hirta, The Cambir, NA07850048, 2013, NG Hodgetts, RD Porley & C Rickerby 8315.

85.4. *Gymnomitrion crenulatum*. 65: on dolerite rock faces and boulders at base of crag, 450 m alt., below Raven Scar, Cronkley Scars, Upper Teesdale, NY83582916, 2013, TL Blockeel 42/314.

85.5. *Gymnomitrion apiculatum*. 92: soil between rocks, 1160 m alt., Ben Macdui, NH980013, T Ottley 12092010, location carefully checked as close to vice-county boundary.

86.1.b. *Marsupella emarginata* var. *aquatica*. 58: face of inclined gritstone rock slab with trickling water at edge of stream, 300 m alt., Arnfield Clough, Tintwistle, SK02989900, 2013, TL Blockeel 42/633.

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