Fig. 1. Investigating the link between *Bryum marratii* and the adjacent dune aquifer at Whiteford Burrows. G. Farr.

BBS Autumn meeting 2018: Llanrwst, 5–7 October

The 2018 BBS Autumn meeting was held in the North Wales town of Llanrwst and followed the usual format, starting with committee meetings on Friday afternoon, followed by an indoor meeting on Saturday and concluding with a field excursion.

Saturday 6 October

This year, the 'paper-reading meeting' did not have a specific theme, although many of the speakers were from the local area and talked about Welsh projects. Our local recorder, **Tim Blackstock**, started the day by telling the participants all about sporophyte frequency in British liverworts. Tim's presentation reminded us that the majority of British liverworts are dioicous and that a higher proportion of dioicous than monoicous liverworts fail to produce sporophytes. He continued to describe species that have never been found with sex organs, those which are rarely fertile despite having both sexes present, and species where only the male or female sex is expressed. Of the species which express both male and female sexes, some express as female more frequently, and Tim gave the examples of *Saccogyna viticulosa* and *Barbilophozia atlantica*. It was interesting to note that only eight species express more frequently as male than female and six of these do not produce sporophytes.

Des Callaghan then presented his latest work on the hydroecology of *Bryum marratii* in Wales (Callaghan & Farr, 2018). *Bryum marratii* is a species of saltmarshes and is of conservation concern as it is listed as Nationally Rare and Vulnerable at British level, Endangered in Wales, as well as being one of the species included in Section 7 of the Environment (Wales) Act 2016. The project was based at two saltmarsh locations in Carmarthen Bay and consisted of finding, recording and flagging all *B. marratii* colonies. Environmental data about tides and aquifers – including pH and electrical conductivity of the

water column, soil cores, elevations at soil surface and at rest water level – were also collected along transects (Fig. 1). The project found that *B. marratii* colonies occur within a very narrow range of elevation on both sites, with only 57 cm between the lowest and the highest colony. It also found that the colonies occur in the upper part of the intertidal zone, are regularly inundated by spring tides and are submerged for 3.6 days per year. The project's conclusions were that *B. marratii* colonies are regularly inundated by spring tides and there is no substantial dilution of tidal water. However, the colonies are found in areas where there is diffuse freshwater discharge from local aquifers, suggesting that this is an important factor in their existence. Des concluded that there is a need for further research on salt and desiccation tolerance of the species and highlighted the threats posed by sea level rises and storm events.

After the coffee break we heard a fascinating talk by **Isuru Kariyawasam**, a PhD student at the Royal Botanic Garden Edinburgh, on taxonomic challenges surrounding the Polytrichaceae in Europe. Isuru first told us about what makes Polytrichopsida a distinct class then touched on the taxonomy before 1971, when every species was a *Polytrichum*. He mentioned the taxonomy used by G.L. Smith in 1992, which put section *Polytrichum* and section *Juniperifolia* under *Polytrichum* and sections *Aporotheca* and *Polytrichastrum* under the genus *Polytrichastrum*. He then discussed the recent molecular studies by Bell and Hyvonen, which placed section *Aporotheca* (i.e. *Polytrichastrum formosum* and *longisetum*) back into *Polytrichum*. Isuru also talked about the history of the *Polytrichum commune* entity, which is one of the earliest mosses to be recognised by people, and described the historic herbaria that contain specimens of *Polytrichum* species. Finally, Isuru talked about the differences between *P. commune* var. *commune* and var. *perigoniale,* which recent molecular studies put into two different clades.

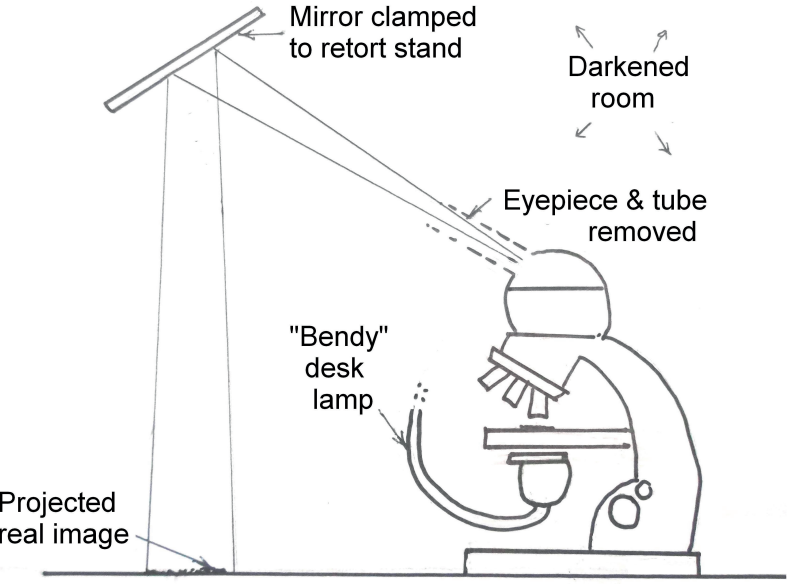
After such an information-rich talk came a lighter one from a member of the North Wales Non-flowering Plant Group, **Susan Andrew**. Susan talked about the group and its efforts to help beginner bryologists become more confident in their identification skills and progress from beginners to improvers. Susan emphasised that the group is composed of very keen amateur

▷Fig. 2. Recreated heathland at Rufford Colliery, Nottinghamshire. Margaret Crittenden.

naturalists, who come from very varied walks of life and have in common a lack of formal botanical education. The group helps by offering resources such as identification guides and guidance for beginners in how to start learning about bryophytes. Field meetings are offered and, in addition, indoor meetings during which members are taught microscopic identification in a supportive environment. The group has also started a Bryophyte Learner Project, which supports members who wish to learn on their own about a particular genus or group of species, and culminates in the individual presenting what they have learned to the whole group during an indoor meeting. It is hoped that the group's experience may inspire other local groups to invest in the learning journey of their members.

After lunch **Peter Jones**, lead specialist for peatland ecosystems at Natural Resources Wales, talked about the Lowland Peatland Survey of Wales (with co-authors S. Bosanquet and K. Birch). This is an on-going project aimed at collecting high quality floristic data on priority lowland peatland habitats in Wales using the National Vegetation Classification (NVC) methodology. The results collected are intended to have many uses, including informing decisions on designation of protected sites (such as SSSIs), guiding management, restoration or monitoring of sites and providing evidence for land use decisions (such as planning applications). Peter explained that this project is the last remaining in-house strategic NVC programme being run by the UK statutory conservation bodies and commented on why this might be. The survey has already produced a new Welsh Lowland Raised Bogs Inventory, with new sites for *Sphagnum austinii*. Information from the Lowland Peatland Survey was used to identify an alternative metric for bogs which are of importance for their bryophyte assemblages, as the current SSSI guidelines do not suit Welsh bogs. Another important aspect of the project was the surveying of the Anglesey rich fens, and in particular *Schoenus nigricans*-dominated mires, a vegetation type which hosts many rare and notable plant species. The survey produced a typical bryophyte zonation for this community, which can be used to evaluate the condition of fragmentary stands of this vegetation and to monitor habitat re-creation undertaken as part of the European-funded Life Anglesey and Llyn

◁Fig. 3. Established heathland at Budby South Forest, Nottinghamshire. Peter Crittenden.



◁Fig. 4. Diagram of home-assembled microscopic projection system. Malcolm Watling.

▽Fig. 5. *Hypnum revolutum* above L'Etang d'Araing in the Ariege Pyrenees. Gordon Rothero.

Fens Project.

Moving away from Wales, Nottinghamshire's county recorder **Margaret Crittenden** reported on the findings of her Master's dissertation on bryophyte assemblages of established and re-created heathlands. Margaret's study aimed to determine the degree to which recreating lowland heathland bryophyte assemblages in newly-created heathland on coal spoil capped with local sandstone was successful. The study compared two newly-created sites and two established heathland sites (Figs 2, 3). Margaret told us about the similarities and differences between the sites, discussed the colonisation of the recreated sites and the role of habitat fragmentation in colonisation. Interestingly, the fieldwork for the dissertation led to the discovery of a rare liverwort, *Lophozia capitata*, in one of the recreated heathlands. The study concluded that the recreation of lowland heathland is successful based on species richness of the bryophyte assemblages and that the presence of a mosaic of wet and dry patches in the recreated heathlands contributed to bryophyte diversity. The creation of heathland will also increase connectivity between areas of this habitat in Nottinghamshire, reducing dispersal distances for all species, including bryophytes.

With a complete change from previous presentations, local bryologist **Malcolm Watling** gave a fascinating talk about the techniques he uses to produce beautiful botanical illustrations for various bryophyte publications. Malcolm explained how real images from the microscope are reflected on a sheet of paper through a mirror and a rough sketch is made tracing the images (Fig. 4). The sketch is then traced neatly in ink on high quality tracing paper. The relevant images are cut out and collated into a plate, which is then scanned as an electronic image. Any alterations are then made on the electronic image. We are now looking forward to seeing Malcolm's illustrations in future BBS publications.

The final presentation from **Gordon Rothero** transported us to the Wildlife Park of the Ariege Pyrenees, in the south-west of France, delighting us with beautiful images of exotic bryophytes and the mountainous landscapes of this region on the border with Spain (Fig. 5). Gordon also explained how his and David Long's records contribute to work recently undertaken in France to produce a bryophyte list for the region.

Sunday 7 October

On Sunday, a group of over 20 bryologists attended the excursion at Craflwyn, an area within the Snowdonia National Park in the ownership of the National Trust, who gave us permission to record. A small group of participants, who arrived on site early, went down to the Afon Glaslyn, across the road, and were shown *Oxystegus daldinianus* by Gordon Rothero.

The whole group then ventured into the woods, where Malcolm Watling showed everybody the small patch of *Teleranea europaea* which Malcolm himself found, new to Wales, in 2013. The patch is so small and on such a difficult-to-access slope that everybody had to queue to take a look at it individually (Figs 6, 7). After this, the group continued north-east through more woodland and moorland, recording a total of 83 species in the main monad (SH6049). Notable species recorded in this monad included: *Jamesoniella autumnalis*, *Splachnum ampullaceum*, *Fissidens polyphyllus*, *Heterocladium wulfsbergii* and *Rhabdoweisia crenulata*.

▽Fig. 6. The waterfall at Craflwyn and the queue to get to the location of *Teleranea europaea*. John Grahame.

The excursion was also a really good opportunity for members of the local North Wales group, who participated in good numbers, to record in familiar habitats under the guidance of many BBS experts.

Reference

Callaghan, D.A. & Farr, G. (2018). The unusual inter-tidal niche of the rare moss *Bryum marratii* Wilson. *Journal of Bryology* 40: 371–376.

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▷Fig. 7. Bryologists admiring the tiny *Teleranea europaea*. John Grahame.

Future Meetings

An overview of the BBS meeting programme for 2020 is given below (further details given on the BBS website). Many areas also have BBS local group meetings and details of these can also be found on the website. Please contact the local Secretary if you wish to attend.

Spring meeting 2020: Barmouth, North Wales: Saturday 4 April 2020 – Thursday 9 April 2020.

The meeting will be based at Plas Caerdeon, Barmouth LL42 1TH. This is an Outdoor Education Centre in North Wales owned by Liverpool Hope University. It is situated between Dolgellau and Barmouth on the A496, and offers accommodation and catering not only to students but also to guests. Further information on costs and types of accommodation will be published in the near future. Please register your interest by emailing Margaret Crittenden on mcrittenden24@googlemail.com.

Summer Meeting 2020 Week 1: Isle of Jura: Saturday June 20th – Saturday June 27th 2020**.**

The Isle of Jura in the Southern Hebrides is one of the most spectacularly remote and unexplored of our western Scottish islands, and approximately half of its tetrads lack a single record. In addition to investigating previously unrecorded areas of moorland, bog, mountains, lochans and coastline there