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Female flowers on *Hippophae rhamnoides* at Cromer, Norfolk.
Photo S. Harrap © 2011 (see p. 18)

A pair of Yellowhammers with Traveller's-joy (*Clematis vitalba*) and Common Wintergreen (*Pyrola minor*). From John Gould's *The birds of Great Britain* (1862-1873) (see p. 39)

Fig. 1, *Orchis* ×*bergonii*: inflorescence, note veining to clasping leaf on stem characteristic of *O. anthropophora*

Fig. 2, *Orchis* ×*bergonii*: close-up, highlighting the short spur, characteristic of *O. simia*

Both photographs taken in Hampshire by M.R. Chalk © 2013 (see p. 34)

Jane Houldsworth at Wayoh reservoir near Bolton. Photo M. Houldsworth © 2013 (see p. 60)

Fig. 1. *Trifolium glomeratum* at Hightown, Merseyside (v.c.59), May. Photo: P.H. Smith © 2013 (see p. 35)

Scrophularia scorodonia, normal (l) and var. *viridiflora* (r) with detail of the latter inset. Both photos taken at South Brent by P. Pullen © 2013 (see p. 30)

Lynne Farrell on the remote islet of Maisgeir with the Birthe Marie boat in the background and also a distant view of Ben More (the highest hill on Mull and a Munro)
Photo L. Farrell © 2013 (see p. 67)

BSBI's stand at Birdfair won the Birdfair Best Stand Award 2013 (Conservation). Rachel Benskin (l) receiving the award from Martyn and Mervy Davies (RSPB). Photo L. Marsh © 2013 (see p. 57)

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Cover picture – : Male flowers on *Hippophae rhamnoides* at Cromer, Norfolk.
Photo S. Harrap © 2011 (see p. 18)

IMPORTANT NOTICES

From The President

IAN DENHOLM, *4 High Firs Crescent, Harpenden, Herts., AL5 1NA*;
(01582 760180; 07974 112993; i.denholm@herts.ac.uk)

It is a huge pleasure to write my first set of notes for *BSBI News* as the Society's President, having been elected to this prestigious position at the AGM held in June in Beaumaris, Anglesey. In Beaumaris I was able to pay tribute to my predecessor, Ian Bonner, who led the Society during a period of substantial change and reforms, ones that I am convinced equip us well for challenges to be faced in the future. Ian has selflessly contributed a great deal of his time on behalf of us all and is now, I sincerely hope, relishing the chance to return to more active botanising in his dual roles as joint recorder for Anglesey (v.c.52) and Westerness (v.c.97).

While extolling Ian's contributions to BSBI, I must also mention on behalf of all who attended this year's AGM, the outstanding work that he, his wife Pippa, and a veritable army of local organisers invested to make our stay on Anglesey such a pleasant and informative experience. The Bulkeley Arms, which we occupied in its entirety, was a relaxing base with plenty of time allocated to meet friends over meals and at the bar. Some unseasonal rainfall in no way diminished the excitement of being guided around some exceptionally rich coastal and fenland habitats. Being a native of Anglesey, but these days very much an 'ex-pat', it was a delight to revisit such locations. A particular personal highlight was my first encounter with *Tephroseris integrifolia* (Field Fleawort) in its ssp. *maritima* guise at the edge of sea-cliffs on Holy Island. Running the central AGM in conjunction with the Welsh one was a novel and very successful initiative that added more opportunities for field visits. Another major highlight for me was exploring parts of the Great Orme that I had not visited before, under the expert guidance of Wendy McCarthy.

During my year as President-elect (as well as previously) I have had the chance to meet a large number of BSBI members, but I am sure there is an equally large number wondering "who on earth is he?"! So perhaps a brief introduction is in order. Having studied zoology at Manchester and genetics at Liverpool, I spent the bulk of my scientific career (*c.*30 years) at Rothamsted, an agricultural research institute based at Harpenden in Hertfordshire. My main area of specialism was studying the adaptations that enable pest organisms to evolve resistance to pesticides, and ways to prevent this occurring. I was also involved in research investigating ecological risks of novel practices and technologies such as GM. Various rises through the hierarchy led to me being invited to constitute and lead a Department of Plant and Invertebrate Ecology at Rothamsted that encompassed very wide-ranging research on biodiversity and functional ecology within agricultural production systems. I left Rothamsted employment in 2012 but retain visiting scientist status there, alongside a recent part-time appointment as Senior Lecturer in Environmental Sciences at the University of Hertfordshire. The latter is also providing experience of teaching at undergraduate and Masters levels, which is rewarding and in contrast to being almost wholly focussed on research activities.

Not too many obvious links to field-based botany so far! However, shortly after moving to Harpenden I had the good fortune to meet and develop a friendship with John and Chris Dony, who at the time were acting as BSBI recorders for both Bedfordshire and Hertfordshire. Numerous visits to the field with them turned a youthful interest in plants into a lifelong passion and hugely improved my confidence in plant identification. Another chance but happy event was meeting (at Rothamsted itself) a very young Richard Bateman, who I had been told "works just down the corridor and shares your interest in orchids". Time

spent in the field with Richard progressed to a close and productive collaboration on the systematics and taxonomy of the genus *Dactylorhiza* (Marsh- and Spotted-orchids), and for the last 25 years we have served as joint BSBI referees for this very interesting but sometimes perplexing group of species. Richard has since held a number of prestigious scientific appointments and has established a leading international reputation for work on Orchidaceae as a whole, but I am delighted that our initial collaboration has survived and been invigorated by some recent expeditions to fill gaps in our morphometric database for British and Irish *Dactylorhiza*. This is intended to result in some comprehensive publications in the near future. I have also in recent years been a member, and latterly chair, of BSBI's Meetings Committee and was especially pleased to coordinate the organisation of our memorable conference "A Great Leap Forward" in Edinburgh last year, celebrating 50 years since the publication of the first *Atlas of the British Flora*.

Enough about me! You will be aware from articles in recent issues of *BSBI News* that BSBI is undergoing a change of status to that of a company limited by guarantee. Concomitantly there is a change of name to 'Botanical Society of Britain and Ireland' – one that to me (and many others I hope) expresses more explicitly the geographical scope of our activities. This process of incorporation continues apace with pre-approval of the 'new BSBI' obtained from the Scottish Charity Regulator, and full registration now granted by the Charity Commission of England and Wales. We now enter the endgame of transferring assets and activities from one society to the other and hope to have this completed in the next 2-3 months. We are indebted to our Hon. Treasurer, Antony Timmins, and Administrative Officer, Clive Lovatt, for steering us smoothly through some seriously heavy administrative and legal hoops to get us where are at present.

A separate, though related development is the appointment of a full-time BSBI Head of Operations to take operational responsibility for the day-to-day running of the society and to co-ordinate our longer-term strategic planning. Following a rigorous recruitment process, we are delighted that Jane Houldsworth accepted the post and commenced work in June this year. Jane joins us with a very relevant background in the administration of environmental organisations (see p. 68 for her personal introduction), and is now deeply engaged in meeting staff and volunteers, and getting to grips with different facets of the organisation. I am sure I speak on behalf of all members in extending to Jane a very warm welcome to the Society.

At the time of writing, we are finalising a Memorandum of Understanding with the Biological Records Centre (BRC) headed by David Roy and based at CEH Wallingford in Oxfordshire. This commits BSBI and BRC to collaborate on the development, maintenance and secure storage of unique botanical resources including our Distribution Database that is reconciling recording data from diverse sources. This important advance not only guarantees database continuity and security but also provides access to the extensive technical expertise and support that BRC can offer. The agreement also provides our Database Officer, Tom Humphrey, with office accommodation at Wallingford and we wish him every success with this relocation. Thanks to all who brought these negotiations to fruition, especially David Pearman, Kevin Walker, Tom himself, and David Roy and his team at BRC.

One aspect of our activities that I am personally very committed to is strengthening our external profile among potential sponsors, other related organisations, the media and the public at large. With coordination from Louise Marsh (see *BSBI News*, **121**: 66-67), Ruth McGuire and others, BSBI has been forging new ground over the last two years through participation in national and regional outreach events. Huge thanks to Laura Gravestock and Oliver Pescott who presented our exhibit at the Natural History Museum's 'Big Nature Day' in July on one of the hottest days of the year. As one of 25 organisations contributing to the influential 'State of Nature' report, we were invited to the May launch in London, featuring

an introduction from David Attenborough. I contributed a five minute talk to a 'speed dating' session delivered against the background cacophony of a wine reception. Character-forming stuff! During 2013, we also exhibited for the first time at 'Birdfair Scotland' and for the second year running at the main Birdfair event at Rutland Water. I am delighted to report that at the latter, BSBI received the award of Best Stand (Conservation) 2013 – great recognition of the effort expended by Louise and her brilliant team of volunteers (see p. 57 and photo on back cover). We used the occasion to commission a short video about BSBI (available via our website) and I had the rare chance to combine passions for botanising and birdwatching by presenting a talk entitled 'Botany for Birders', which will be posted on the website shortly.

Finally, I would like to encourage as many members as possible to consider attending the Annual Exhibition Meeting being held at the Natural History Museum on 23rd November this year (see flier enclosed with this copy of *BSBI News*). The AEM is a key event in the Society's calendar. It provides an excellent opportunity to network with officers and fellow members, hear about new discoveries and developments, purchase or order the latest botanical publications, and maybe even indulge in some pre-Xmas shopping in central London! If thinking of attending, please also consider offering an exhibit that might include photos of field visits or local events, new and interesting records, contributions to botanical research, or material that you would like an expert to confirm or identify. I look forward to meeting up with many of you at the AEM and at future BSBI events.

Notes from the Editors

TREVOR JAMES (Receiving Editor), *56 Back Street, Ashwell, Baldock, Herts., SG7 5PE.* (Tel.: 01462 742684) (trevorjjames@btinternet.com)
GWYNN ELLIS (General Editor), *41 Marlborough Road, Roath, Cardiff, Wales, CF23 5BU* (Tel.: 02920 496042) (membership@bsbi.org.uk / rgellis@ntlworld.com)

Congratulations to Richard Gornall and Louise Marsh on the *New Journal of Botany* being Maney's Journal of the Month in July and also for the excellent review in the August 2013 issue of *Taxon* (**62(4)**: 858-859). In the same issue, on pages 862-865, there is a very useful 'guide to getting book and journal information (including PDFs) cost-free' by Rudolf Schmid. Both can be viewed for free at the following link: http://www.ingentaconnect.com/content/iapt/tax/2013/00000062/00000004/art00039

Congratulations also to Sylvia Reynolds on the award of the Glasnevin Botanic Gardens 'Gold Medal' for her superb *Flora of County Limerick*.

Binders for *BSBI News*

One of our members, Michael Scott has asked if BSBI have thought of producing some sort of binder to hold back issues (like the ones available from Andrew Branson for *British Wildlife*, for example). Alternatively, has any member found a suitable box file type container that is suitable for safely storing back issues (or, if not, have you thought of asking a manufacturer to produce something appropriate).

Andrew tells me that *British Wildlife* binders are sourced from Modern Bookbinders Ltd, Pringle Street, Blackburn, Lancashire BB1 1SA, England. (modern.binders@btconnect.Com; http://www.modernbookbinders.com and cost about £8 each.

If enough members express an interest (we need at least 50) BSBI might be persuaded to put in a bulk order with bespoke covers. Please contact me in the first instance.

Where are they now?

We are still trying to find the current addresses of the following members:

Dr D. Briggs, Wolfson College, Barrow Road, Cambridge, CB3 9BB.

Mr M. Stevenson, Wey Cottage, Church Street, Old Woking, Surrey, GU22 9JE.

Dr P.A. Wookey, School of Biological and Environmental Sciences, University of Stirling, Stirling, FK9 4LA.

NOTES

The obscure Glaucous Glasswort: *Salicornia obscura*

DAVID J .HAMBLER, *14 Yew Tree Avenue, Bradford, BD8 0AD*; (dj.hambler@btinternet.com)

Glaucous Glasswort, *Salicornia obscura* ('Typus in Herb Mus Brit*') was first described by Ball & Tutin (1959). It has a markedly disjunct distribution in Britain, and merits only ten dots on its map in the *New atlas of the British & Irish flora* (S.J. Leach, in Preston *et al*. 2002): one dot represents the type locality on Hayling Island, from which, according to the *New atlas*, it has been lost. It has never been recorded from the estuary of the River Medway although plants 'fitting the description of this species' have been found along the adjacent Swale and Oare Marshes (Philp, 1992), and there is a corresponding dot in the *New atlas*.

The mapped disjunction is likely to be an artefact, and, as Leach suggests, underrecording, with some populations being misidentified or overlooked as *S. europaea* (Common Glasswort), and others having been destroyed through human activity. The diploid *S. obscura* was described by its authors as often difficult to separate with certainty from forms of the tetraploid species *S. fragilis* (Yellow Glasswort) and *S. lutescens* which they also named in their paper. The line drawings they presented of *S. obscura* and *S. lutescens* show no differences in the attitude of primary branches (*S. fragilis* is not illustrated). Upward curvature of the branches of *S. obscura* is mentioned in later accounts, but not in the original description by P.W. Ball & T.G. Tutin (1959). Such curvature is shown in a colour photograph in the *Interactive flora of NW Europe* (Stace *et al*. 2005-2013), and in a colour photograph of a shrubby plant from the continent by Lahondère (2004). *Salicornia obscura* was described originally from Britain as a diploid species, commonly with primary branches only.

In August 1951 I found a small stand of plants growing on a barge hulk, in Whitewall Creek (TQ7569) by the Chatham Reach of the River Medway (see map p. 6). These plants (see photo), with no secondary branching, and with bulging, fertile segments, did not relate to any published descriptions, and I could only use my default "*S. europaea*" as an approximation: an upward curvature of the lowermost inflorescence-tipped primary branches was the most conspicuous distinctive feature of this unidentified Glasswort. The site was cleared of many barge hulks in 1996 during preparations for construction of the Medway Tunnel; it is now buried beneath Neptune Close – part of a business park, postcode ME2 4SN. In 1951 I made a mental note of another possible stand of similar *Salicornia* plants some three or four km upstream, outside the wall fringing Temple Marsh (see map).

Salicornia obscura (r) with *S. ramosissima* (l) rooted among timbers of a barge hulk, between tidemarks in Whitewall Creek on the River Medway. The exposed part of the tape measures 5 inches. Photo D.J. Hambler © 1951

I took no specimens of what then appeared to be an uncommon sort of Glasswort, and have retrospectively identified the plants from my photograph. This account therefore records a probable historical occurrence of *S. obscura,* and yet another anthropogenic local extinction of the species. It also provides a direct photographic comparison of the living plant with a much-branched member of the same (*S. europaea*) aggregate growing alongside it.

*No holotype specimen can now be found in the Natural History Museum's herbarium (Mark Spencer in email.): this suggests that a substitute should be nominated, if possible from material identified by the original authors.

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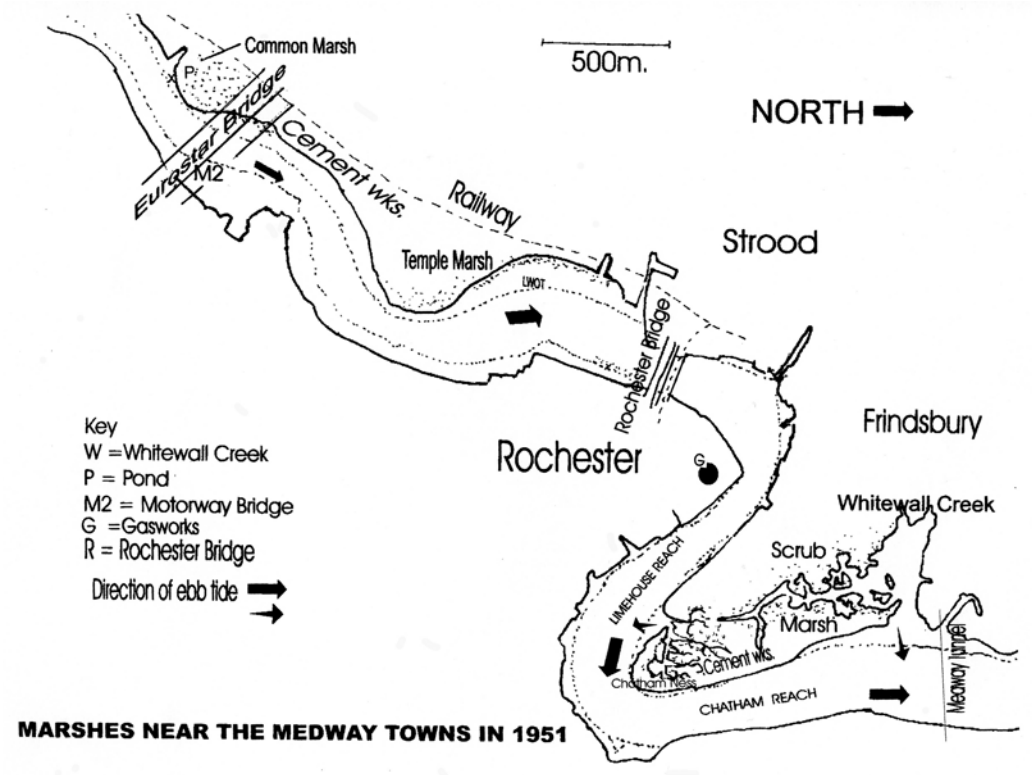

Part of tidal River Medway as it was in 1951 with the positions of more recent developments: Medway Tunnel and Eurostar Bridge shown.

The response of aquatic plants to restoration and continuity of navigation in canals: the example of the Huddersfield canals

R. GOULDER, *5 Bishops Croft, Beverley, HU17 8JY*; (r.goulder@hull.ac.uk)
M. J. MORPHY, *7 Mallard Drive, Montrose, DD10 9NB*; (mj.morphy@tiscali.co.uk)

Navigation canals in Britain were largely excavated in the late 18th and early 19th centuries. Many are SSSIs and have become an important conservation resource for aquatic plants (Briggs, 2012). Heavy boat traffic, by causing turbidity and mechanical damage, is deleterious to aquatic plants (Murphy & Eaton, 1983; Willby, Pygott & Eaton, 2001) and while the restoration to navigation of disused, vegetation-rich canals is a potential threat to plant conservation (Briggs, 2012) the failure to arrest hydroseral development can lead to the loss of waterway habitats. However, with appropriate management and light boat traffic, aquatic plant communities of conservation value may coexist with navigation (IWAC, 2008). This article describes how restoration to navigation of a disused canal affected the aquatic flora and compares it with that of the continuously navigated waterway into which it flows.

The canals studied were the Huddersfield Narrow Canal east of the Pennines and the Huddersfield Broad Canal. The objectives of the study were achieved by comparison of present-day (2012) plant records with records made more than 30 years ago (1978-1980). The canals are in West Yorkshire. The trans-Pennine Huddersfield Narrow Canal was opened throughout in 1811. The eastern part of the canal descends for about 12.5 km from the eastern portal of Standedge Tunnel (SE039119) to the centre of Huddersfield. The fall in altitude is considerable (about 130 m) and there are 42 locks, with pounds of varying length between them. In Huddersfield, the Narrow Canal makes an end-on junction with the Huddersfield Broad Canal, at Lock 1E (SE148162). The Broad Canal, opened about 1780, continues eastward for about 6 km to join the River Calder. The fall is about 20m and there are nine locks. Commercial navigation of the Narrow Canal ceased in the early 20th century and by mid-century the waterway was derelict, locks had mostly been cascaded or capped and parts of the channel had been infilled (see Colour Section, Plate 1). Morphy (1981) described the Narrow Canal as having a variety of habitats ranging from a stream with stony riffles flowing along the canal bed, to pond-like deep-water sections, and overgrown marshy sections where the canal was barely discernible. These different habitats supported an abundance and diversity of aquatic plants. Morphy, Thomas & Higgins (1980) wished to establish a baseline by which long-term vegetation change could be assessed in view of proposals to develop the canal as a recreational resource and so in 1978 they surveyed the aquatic vegetation of the Narrow Canal east of Standedge Tunnel. The future that emerged for the canal was full restoration to leisure navigation by 2001; a programme that involved rebuilding locks and wash walls, dredging throughout and re-excavation of in-filled sections, with some restored sections in narrow concrete channels (sufficient only for a 2.1 m-wide narrow boat) or in tunnels (Gibson, 2002).

The Broad Canal, built to take wide boats (4.3 m), has been continually navigated throughout its history, albeit with replacement of commercial by leisure navigation. The waterway became a cul-de-sac on closure of the Narrow Canal (and about 0.5 km in Huddersfield became disused) but traffic increased when a through route was restored, following reopening of the Narrow Canal in 2001. The vegetation of the Broad Canal was surveyed in 1980 (Lucas & Morphy, 1985) and this led Morphy (1981) to stress the contrasting ecology of the two canals. The Broad Canal benefitted from maintenance for navigation and was deep and uniform in nature; submerged plants, notably *Potamogeton* spp. (Pondweeds) were abundant.

The Narrow Canal is fed at its summit by water from a catchment of upland heath and grassland and tends to be acid, peaty and nutrient poor. Morphy (1981) emphasised change in water quality eastwards along the Narrow Canal and then the Broad Canal. As more feed-water entered there was a trend towards the water becoming less acid, harder, and more fertile. This is supported by Morphy's unpublished 1981-1982 data, which show initial conductivity values of <100 µS cm^{-1} increasing to 200-400 µS cm^{-1} by the eastern end of the Narrow Canal and throughout the Broad Canal. Similarly, orthophosphate increased from <10 µg PO_4-P l^{-1} to >100 µg l^{-1}. This trend is also demonstrated by data from the Environment Agency from April 2001 to January 2003 (n=17 sampling days) for Golcar Bottom on the Narrow Canal (about 7.8 km east of Standedge Tunnel) and the Broad Canal in Huddersfield (about 14.3 km east of the tunnel). Mean conductivity at Golcar Bottom was 191 µS cm^{-1} (s.d.=29) compared with 292 µS cm^{-1} (s.d.=65) at Huddersfield. Similarly mean orthophosphate increased from 67 µg PO_4-P l^{-1} (s.d.=38) to 146 µg l^{-1} (s.d.=98). These downstream increases were statistically significant ($P<0.05$, Mann-Whitney *U*-test).

In June-July 2012 aquatic plants were recorded by Goulder along successive 0.5 km lengths of the canals. Plants were recorded by eye from the towing path and identification of emergent plants on the far side of the canal was assisted by the use of binoculars. Submerged plants were retrieved using a grapnel. Generally 20 grapnel hauls were made per 0.5 km section. The exception to this was in parts of the Broad Canal where use of a grapnel was avoided to ensure that the Schedule 8 (Wildlife & Countryside Act, 1981) species *Luronium natans* (Floating Water-plantain) was not disturbed. An estimate of abundance was made for each species (Holmes, 1983); i.e. 1=<0.1% whole-channel cover, 2=0.1-5% cover, 3=>5% cover. The sum of the abundance scores of all species recorded in each 0.5 km section ($\sum A$) was used as an approximate integrated measure of species richness and vegetation abundance. Records of aquatic plants for 1978-1980 were taken from Morphy, Thomas & Higgins (1980) and Lucas & Morphy (1985). These authors provided summer records of aquatic plant species at points approximately 200 m apart along the whole length of the two canals. Additional information was taken from Morphy's contemporary (1978-1981) records. Precise definition of 'aquatic plant' is elusive, as there is a continuum from submerged, through floating-leaved and emergent plants to wetland and terrestrial plants. Throughout this study we have considered only those species that are listed by Palmer & Newbold (1983) as aquatic plants that are found in England and Wales and/or are on the JNCC (2005) checklists for native aquatic plants and non-native aquatic vascular plants that occur in UK canals.

The canal flora in 2012

Submerged and floating-leaved vegetation

Submerged and floating-leaved vegetation was generally sparse and species poor in the Narrow Canal (Fig 1, p. 15). Six species were recorded in the Narrow Canal in 2012 (Table 1, p. 13), compared with 12 species in the Broad Canal (Table 2, p. 14). Mean species richness in the Narrow Canal was only 1.2 taxa per 0.5 km, compared with 8.3 taxa per 0.5 km in the Broad Canal, while mean $\sum A$ was 1.4 per 0.5 km compared with 12.6 per 0.5 km in the Broad Canal. Along the initial 7 km east of Standedge Tunnel only three submerged/floating-leaved taxa were recorded, namely the aquatic moss *Fontinalis antipyretica* (in five 0.5 km lengths) and *Callitriche* sp. (Water Starwort) and the floating-leaved morphotype of *Persicaria amphibia* (Amphibious Bistort), each in only one 0.5 km section. Further along the Narrow Canal, from 7 km east of the tunnel to its junction with the Broad Canal, *Lemna minor* (Common Duckweed) was found in nine out of eleven 0.5 km sections, *Nymphoides peltata* (Fringed Water-lily) and *Callitriche* sp., both in six 0.5 km sections, and *Potamogeton crispus* (Curled Pondweed) and *Fontinalis antipyretica*, both in one 0.5 km section. The only submerged/floating-leaved species ever recorded at >5% cover was

Nymphoides peltata between 8.5-9 km east of Standedge Tunnel. None of the others were ever recorded at >0.1% cover.

Submerged and floating-leaved plants were much more apparent in the Broad Canal (Fig. 1). The most abundant and widely-distributed submerged species was *Elodea nuttallii* (Nuttall's Waterweed), recorded in all twelve 0.5 km sections and at >5% cover in five of these. The most conspicuous floating-leaved plants were *Potamogeton natans* (Broad leaved Pondweed), recorded in ten 0.5 km sections and at >5% cover in six of these; and *Sparganium emersum* (Unbranched Bur-reed), also found in ten 0.5 km sections and at >5% cover in two of these. *Callitriche* sp., *Lemna minor* and *Potamogeton crispus* were each found in eleven or twelve 0.5 km sections but none ever reached 5% cover.

Amongst the submerged and floating-leaved vegetation, the species with the most obvious conservation interest was *Luronium natans* (Floating Water-plantain). Scattered patches of the floating leaves and flowers of this plant were found along the most easterly 4.5 km of the Broad Canal, usually along the foot of the wash wall on the towing-path side, and extensive underwater rosettes were visible. Passing boats uprooted these, so that the stolon-linked rosettes floated alongside the wash wall (see Colour Section, Plate 1). This species was recorded in nine 0.5 km sections and at >5% cover in three of these. Also of conservation value were the submerged pondweeds *Potamogeton trichoides* (Hairlike Pondweed) which was sparsely present along much of the Broad Canal, being recorded in nine 0.5 km sections, but always at <0.1% cover; and *Potamogeton obtusifolius* (Blunt-leaved Pondweed) recorded at <0.1% cover in two 0.5 km sections. Both are uncommon in West Yorkshire (Lavin & Wilmore, 1994).

Emergent vegetation

Twenty-two emergent species were recorded in the Narrow Canal in 2012 (Table 1) and sixteen in the Broad Canal (Table 2). The species richness and abundance scores tended to be much the same along the two canals (Fig. 1). Mean species richness in the Narrow Canal was 5.9 taxa per 0.5 km compared to 5.6 taxa per 0.5 km in the Broad Canal. Mean $\sum A$ in the Narrow Canal was 8.6 per 0.5 km compared to 8.0 per 0.5 km in the Broad Canal. A linear emergent plant community tended to be established in silt at the foot of the wash wall along the towing-path side of the canals, and in places along the far side, except where there was heavy tree shading, the marginal water was too deep, or where perhaps there had been recent dredging, or where the waterway was confined to a recently-constructed (post-restoration) concrete channel, as in parts of the village of Slaithwaite (5 km east of Standedge Tunnel) and Huddersfield. In some particularly shallow areas the emergent vegetation extended further into the channel.

Much the most conspicuous emergent species in the Narrow Canal was *Equisetum fluviatile* (Water Horsetail), which was recorded in eighteen 0.5 km sections, being at >5% cover in six of these. *Typha latifolia* (Bulrush) also became prominent east of Slaithwaite, where it was recorded in twelve 0.5 km sections, being at >5% cover in four of these. No other species achieved >5% cover along the Narrow Canal. In the Broad Canal *Glyceria maxima* (Reed Sweet-grass) was the dominant emergent species, being recorded in all twelve 0.5 km sections and at >5% cover in ten of these. No other emergent species achieved >5% cover along the Broad Canal.

A feature of the Broad Canal is that on the north side (the far side from the towing path) there were intermittent lengths of textile, up to about 90 m in length, attached to vertical wooden posts and forming a marginal sheltered strip, approximately 2 m wide between the textile curtain and the canal bank. These structures, now decrepit, were intended to be refuges for *Luronium natans.* Vegetative material dislodged during dredging in 2002 was planted in these refuges (Butterworth, 2002). By 2012 the refuges were seen to be occupied by a more or less pure stand of *Glyceria maxima* sometimes with scattered plants of the aggressive alien *Impatiens glandulifera* (Indian Balsam).

Change in the flora since 1978-1980

The Narrow Canal

There were substantial losses of submerged and floating-leaved species from the Narrow Canal between 1978 and 2012. Eleven of 14 species recorded in 1978 were not found in 2012 (Table 1). In addition, three further species that were recorded in 1996, part-way through the restoration project (Ecological Advisory Service, 1996a) were not recorded in 2012. These were *Ceratophyllum demersum* (Rigid Hornwort), *Nymphaea alba* (White Water-lily) and *Potamogeton natans*. The most significant loss was *Luronium natans,* although this species persisted at Slaithwaite after restoration until at least 2001 (Newbold, 2001). Five of the losses were, however, alien species: *Azolla filiculoides* (Water Fern), *Egeria densa* (Large-flowered Waterweed), *Elodea canadensis* (Canadian Waterweed), *Lagarosiphon major* (Curly Waterweed) and *Vallisneria spiralis* (Tapegrass). Three new species of submerged and floating-leaved plants included *Nymphoides peltata*, which had become conspicuous in the Narrow Canal by 2012.

Losses of emergent plants from the Narrow Canal were much less. Only two of 18 check-list species recorded in 1978 had been lost by 2012 (Table 1), the loss of *Eleocharis acicularis* (Needle Spike-rush) being of conservation significance. There were six new species of emergent plants, which included *Butomus umbellatus* (Flowering-rush) in Huddersfield. Some of the emergent species had markedly declined in abundance. Altogether, only three plants of *Alisma plantago-aquatica* (Water plantain) were found in two 0.5 km lengths of the Narrow Canal, whereas it was recorded at ten sampling points in 1978. Similarly, only one plant of *Ranunculus flammula* (Lesser Spearwort) was found in 2012, compared with records at eight sampling points in 1978. Other emergent species appeared to have been abundant in both 1978 and 2012, most notably *Equisetum fluviatile*, which was recorded at 15 sampling points in 1978 and in eighteen 0.5 km sections in 2012.

The Broad Canal

Losses of submerged and floating-leaved species from the Broad Canal were much less than from the Narrow Canal. Seven out of 11 species recorded in 1980 were still there in 2012 (Table 2), and the lost species included the aliens *Elodea canadensis* and *Lagarosiphon major*. In addition, *Ceratophyllum demersum*, present in 1996 (Ecological Advisory Service, 1996b) was not recorded in 2012. The most significant loss was *Potamogeton berchtoldii* (Small Pondweed), which had been recorded at nine sampling points in 1980. There were five new species of submerged and floating-leaved plants in 2012. The pondweed flora especially appeared to be more diverse. *Potamogeton obtusifolius*, *Potamogeton pectinatus* (Fennel Pondweed) and *Potamogeton trichoides* were new occurrences and of these *P. obtusifolius* and *P. trichoides* are of conservation interest. *Luronium natans* had greatly increased its range. In 1980, it was recorded at only two sampling points along the Broad Canal whereas, by 2001, it was present at more than 30 locations and in places occupied the whole width of the channel (British Waterways, 2001). By 2012, subsequent to dredging in 2002, it was conspicuous along 4.5 km of the canal.

There was little change in species composition of emergent plants in the Broad Canal (Table 2). Eleven of the species recorded in 1980 were still there in 2012. Only two species had apparently been lost while five were new records. The newcomers included *Butomus umbellatus* and *Typha latifolia*.

Discussion

Recording of submerged plants in the Narrow Canal was sometimes hindered by turbidity, but this was compensated for by use of a grapnel, search for floating fragments and visual examination of shallow marginal areas. A further visit in late August 2012 yielded no additional species, although more might have been found had there been further survey effort.

The loss of submerged and floating-leaved species from the Narrow Canal since 1978, together with reduced abundance of emergent plants, is believed to reflect a complex of causal

factors: in the first place the effects of restoration and secondly, since 2001, the impact of navigation. In the first case, restoration work required severe environmental disruption, including clearance of vegetation, dredging, and comprehensive de-watering, with consequent impacts on canal depth, canal profile, sediments and flow regimes. To these must be added the effects of the replacement of cascades and capped lock chambers and the rebuilding of wash walls and locks. There followed the impact of boat traffic when the canal was re-opened in 2001. Whilst boat traffic can have adverse effects on canal plants (Murphy & Eaton, 1983), in this case it may not have been so deleterious, for traffic was relatively light. Only four boat movements were observed over four days recording along the Narrow Canal in June 2012, although these were weekdays and traffic is likely to have been greater at weekends and/or later in the summer. Over 2012 as a whole, Lock 41E, about 1 km east of Standedge Tunnel, was operated 328 times (Canal & River Trust, 2013). Lock usage and canal traffic are likely to have various impacts on canal biota, viz.: scouring, strong flows, siltation (Smith, 1981), and these are likely to be more intense in a narrow canal in which the incidence of locks is higher than in any comparable waterway in Britain. Whilst care was taken to conserve canal structures that are important industrial artefacts, from the perspective of aquatic plants the restored canal might be regarded as essentially a new habitat. Newbold (2001) described the eastern half of the Narrow Canal in summer 2001 as having a paucity of aquatic species with no true aquatic species to be found in many stretches. It is possible that the post 2001 vegetation is in a long lag-phase, to which tree shading, natural peaty colouration/turbidity, and a potential shortage of plant propagules may be contributing. The aquatic vegetation of 1978, in contrast, had benefited from habitat diversification and about 170 years in which to become established.

A positive feature of the Narrow Canal is the persistence of substantial stands of *Equisetum fluviatile* along most of the canal. Although this species is not uncommon in West Yorkshire, its abundance in the canal is an interesting variant of the more or less ubiquitous dominance by *Glyceria maxima* of emergent marginal vegetation in Yorkshire canals.

The relative stability of aquatic vegetation in the Broad Canal, in contrast to the Narrow Canal, presumably reflects its less-disturbed history. The broad similarity of species recorded in 1980 and in 2012, with a few gains and losses (Table 2), suggests that the canal's current levels of boat traffic and management regime have resulted in a degree of ecological stability that is appropriate for plant conservation. Over 2012, Lock 2 on the Broad Canal was operated 448 times (Canal & River Trust, 2013). It is possible that the greater diversity of aquatic plants in the Broad Canal, especially submerged species, is in part linked to more favourable water quality. Some taxa, *Potamogeton* spp. for example, may have benefited from the less acidic and more nutrient-rich conditions of the Broad Canal as reflected in higher orthophosphate and conductivity values.

There are few studies on the ecological impacts of canal restoration (Briggs, 2012) and the long-term implications for plant conservation of restoration of the Narrow Canal are not altogether clear. The passage of more years or decades may be necessary before a definitive evaluation can be made. In the short-term, however, there has certainly been much loss of vegetation and change in the nature of aquatic habitats within the canal. A mix of shallow flowing-water and deep-water lengths, and an over-riding importance of hydroseral succession towards complete cover by emergent plants and in places colonisation by *Salix* spp. (willows) has been replaced by continuous deep water, with intermittent marginal vegetation that includes most of the emergent species recorded before restoration (Table 1). Losses have been chiefly amongst submerged/floating leaved species (Table 1). Several of the lost taxa were aliens that had probably originated as aquarium or water-garden discards. Their loss is not of conservation significance. The apparent loss of *Luronium natans* from the Narrow Canal, first recorded at Slaithwaite in about 1950 (Fryer, 1952), is unfortunate.

In contrast, in the Broad Canal *Luronium natans* was widespread and thriving in 2012. The observation of rosettes uprooted by passing boats, floating beneath the wash wall and with the potential to colonise accords with Willby & Eaton (1993) who specifically linked the persistence of *Luronium natans* in canals to disturbance associated with light boat traffic. The occasional refuges parallel to the channel and behind textile screens appear not to have helped plant conservation in the Broad Canal. They have been colonised by the widely-abundant *Glyceria maxima*, while *Luronium natans* thrives on the opposite (towing-path side), probably demonstrating the advantage of a modicum of disturbance.

Acknowledgements:
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Table 1. Huddersfield Narrow Canal: checklist aquatic plants in 2012 and 1978

Submerged and floating-leaved species	**Emergent species**
Recorded in both 2012 and 1978	**Recorded in both 2012 and 1978**
Callitriche sp. (Water-starwort) (7)	*Acorus calamus* (Sweet-flag) (7)
Fontinalis antipyretica (Greater Water-moss)* (6)	*Agrostis stolonifera* (Creeping Bent)*(18)
Lemna minor (Common Duckweed) (9)	*Alisma plantago-aquatica* (Water-plantain) (2)
n of species=3	*Caltha palustris* (Marsh-marigold) (3)
	Equisetum fluviatile (Water Horsetail) (18)
Recorded in 2012 but not in 1978	*Galium palustre* (Common Marsh-bedstraw) (6)
Nymphoides peltata (Fringed Water-lily) (6)	*Glyceria fluitans* (Floating Sweet-grass) (11)
Persicaria amphibia (Amphibious Bistort) (1)	*Iris pseudacorus* (Yellow Iris) (12)
Potamogeton crispus (Curled Pondweed) (1)	*Juncus effusus* (Soft-rush) (19)
n of species=3	*Nasturtium officinale* agg. (Water-cress) (1)
	Oenanthe crocata (Hemlock Water-dropwort) (5)
Recorded in 1978 but not in 2012	*Phalaris arundinacea* (Reed Canary-grass) (19)
Azolla filiculoides (Water Fern)*	*Ranunculus flammula* (Lesser Spearwort) (1)
Egeria densa (Large-flowered Waterweed)	*Solanum dulcamara* (Bittersweet) (3)
Elodea canadensis (Canadian Waterweed)	*Typha latifolia* (Bulrush) (12)
Sparganium emersum (Unbranched Bur-reed)	*Veronica beccabunga* (Brooklime) (2)
Juncus bulbosus (Bulbous Rush)	*n* of species=16
Lagarosiphon major (Curly Waterweed)	
Lemna gibba (Fat Duckweed)	**Recorded in 2012 but not in 1978**
Luronium natans (Floating Water-plantain)	*Butomus umbellatus* (Flowering-rush) (1)
Potamogeton berchtoldii (Small Pondweed)	*Eleocharis palustris* (Common Spike-rush) (2)
Ranunculus omiophyllus (Round-leaved Crowfoot)	*Glyceria maxima* (Reed Sweet-grass) (2)
	Mentha aquatica (Water Mint) (1)
Vallisneria spiralis (Tapegrass)	*Myosotis scorpioides* (Water Forget-me-not) (1)
n of species=11	*Sparganium erectum* (Branched Bur-reed) (1)
	n of species=6
	Recorded in 1978 but not in 2012
	Eleocharis acicularis (Needle Spike-rush)
	Hydrocotyle vulgaris (Marsh Pennywort)
	n of species=2

The number of 0.5 km sections of canal (out of 25) in which each species was recorded in 2012 is given in brackets. 1978 records are from Morphy, Thomas & Higgins (1980) except *indicates records from Morphy's contemporary (1978-1981) notes.

Table 2. Huddersfield Broad Canal: checklist aquatic plants in 2012 and 1980

Submerged and floating-leaved species	Emergent species
Recorded in both 2012 and 1980	**Recorded in both 2012 and 1980**
Callitriche sp. (Water-starwort) (12)	*Acorus calamus* (Sweet-flag) (3)
Elodea nuttallii (Nuttall's Waterweed) (12)	*Alisma lanceolatum* (Narrow-leaved Water-plantain) (4)
Lemna minor (Common Duckweed)* (12)	*Alisma plantago-aquatica* (Water-plantain) (4)
Luronium natans (Floating Water-plantain) (9)	*Glyceria maxima* (Reed Sweet-grass)* (12)
Nitella sp. (Stonewort) (6)	*Iris pseudacorus* (Yellow Iris) (1)
Potamogeton crispus (Curled Pondweed)* (11)	*Juncus effusus* (Soft-rush) (2)
Potamogeton natans (Broad-leaved Pondweed)* (10)	*Nasturtium officinale* agg. (Water-cress) (1)
n of species=7	*Oenanthe crocata* (Hemlock Water-dropwort) (12)
Recorded in 2012 but not in 1980	*Phalaris arundinacea* (Reed Canary-grass) (1)
Azolla filiculoides (Water Fern) (4)	*Solanum dulcamara* (Bittersweet) (1)
Potamogeton obtusifolius (Blunt-leaved Pondweed) (2)	*Sparganium erectum* (Branched Bur-reed) (5)
Potamogeton pectinatus (Fennel Pondweed) (2)	*n* of species=11
Potamogeton trichoides (Hairlike Pondweed) (9)	**Recorded in 2012 but not in 1980**
Sparganium emersum (Unbranched Bur-reed) (10)	*Agrostis stolonifera* (Creeping Bent) (10)
n of species=5	*Butomus umbellatus* (Flowering-rush) (1)
Recorded in 1980 but not in 2012	*Equisetum fluviatile* (Water Horsetail) (1)
Elodea canadensis (Canadian Waterweed)	*Galium palustre* (Common Marsh-bedstraw) (7)
Lagarosiphon major (Curly Waterweed)	*Typha latifolia* (Bulrush) (2)
Lemna gibba (Fat Duckweed)	*n* of species=5
Potamogeton berchtoldii (Small Pondweed)*	**Recorded in 1980 but not in 2012**
n of species=4	*Ranunculus sceleratus* (Celery-leaved Buttercup)
	Myosotis scorpioides (Water Forget-me-not)
	n of species=2

The number of 0.5 km sections of canal (out of 12) in which each species was recorded in 2012 is given in brackets. 1980 records are from Lucas & Morphy (1985); *indicates species that were also recorded in 1978 in the most westerly 0.5 km of the Broad Canal by Morphy, Thomas & Higgins (1980).

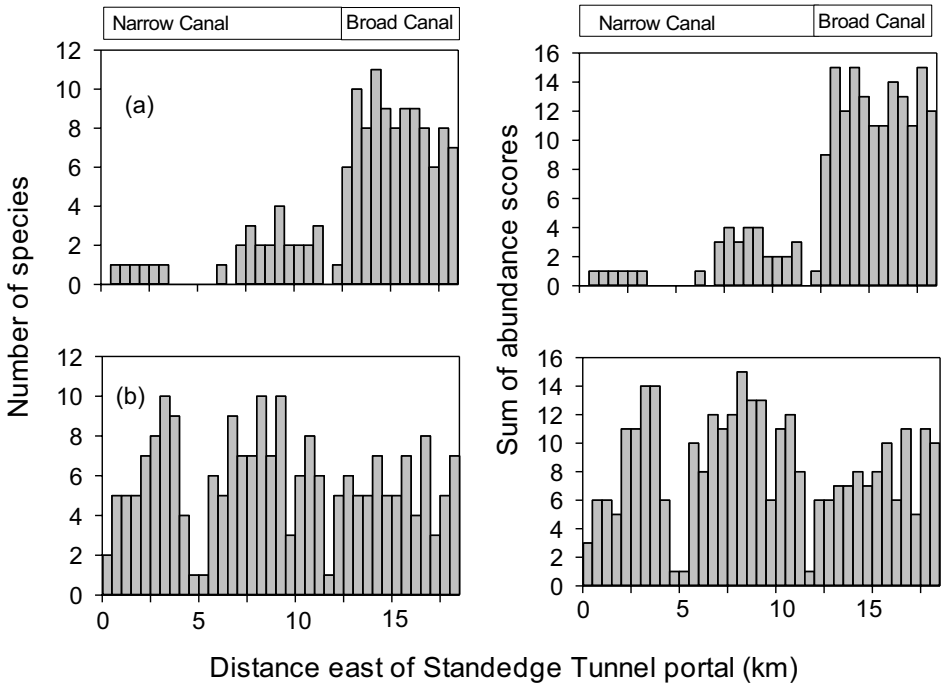

Fig. 1. Checklist aquatic plants in the Huddersfield canals 2012; (left) number of species per 0.5 km and (right) sum of abundance scores per 0.5 km for (a) submerged and floating-leaved species, and (b) emergent species.

Hazels – *Corylus avellana*, *Corylus maxima* and putative hybrids?

MIKE WILCOX, *43 Roundwood Glen, Greengates, Bradford, BD10 0HW*; (michaelpw22@hotmail.com)

Corylus avellana L. (Hazel) is a very common native plant in the right habitat and would appear to have been planted in some areas as a hedge plant. *C. maxima* Mill. (Filbert) is an introduced planted tree/shrub but can be self-sown (or the result of squirrels and birds burying them!) occurring as a semi-naturalised shrub and said to be scattered in southern Britain. However, Filbert is found more widely than this (some plants being the purple-leaved variety, 'Purpurea'), but it is usually a relic of planting, although I have seen both green and purple-leaved plants 'self-sown'. Filbert is said to have been grown for the nuts in the orchards of the south, particularly Kent, where many were known as Kentish Cobs. However, a number of these plantings and other plants which are self-sown from these introductions appear to be the putative hybrid with *C. avellana*, which, as Stace (2010) points out could be the parentage of some of the original Kentish Cobs. However, putative hybrids are likely to be recorded as one or the other parent due to lack of information about what the difference is between the putative hybrids and their parents. 'Intermediate' is a general term used for many hybrids but often in reality they have a look of one parent more than the other. These two species of hazel are very similar, with limited differences, perhaps making it even more difficult.

The bracts surrounding the nut seem to be the most useful character to distinguish between the two species and also what may be considered to be the hybrid. In Filbert, the bracts (at least as far as I know) form a fused tubular involucre around the nut and the cut top part is usually much longer than the nut, (± laciniate

at the top), see right hand nut in the photograph provided (Fig. 1). In Hazel, the bracts are divided more or less to the base, but can be, and often are, overlapping at the base (see nut on the left in fig. 1). However, in this instance for simplicity, both these nuts in the photo are from the same tree and show the bracts fused on one side and open, overlapping at the base on the other side. This appears to be (at least to me) the hybrid Hazel, with this as an intermediate (and possibly the only?) character.

Fig. 1, putative Hybrid Cob (both nuts from same tree showing characters of both parents as described in the text). Photo M. Wilcox © 2013

I have been told that there are hundreds of cultivars in these two taxa and that the bracts are variable, but how then can the hybrid be told from either parent? I believe that the bracts of native Hazel are not fused for their length and overlap at the base (generally the nut can be seen at the top). Those of Filbert are large and fused for most of their length, except for the laciniate apex, often hiding the nut. It could then be that those with fused bracts on one side and open but overlapping at the base on the other are of hybrid origin (?), regardless of the species name applied. It may also be the case that similar plants belonging to either parent as 'a cultivar' could also be of hybrid origin if the bracts are as described here. Otherwise it seems that there would be no way to tell if these are hybrids, and testing every one for a chromosome count is unlikely to be useful anyway, as both have 2n=22 and 28 (unless a 2n=22 crossed with 2n=28 to give 2n=25). This is an impractical solution except to try and confirm that hybrids exist. If there is so much variation in the bracts and no other way to tell, then perhaps there is only one variable species modified for cultivation!

The putative hybrid has been found self-sown in Bradford (v.c.63) SE13, 30/08/2010, M. Wilcox, on waste ground next to a galvanised fence, behind which is a hedge of introduced plants of the same. It is also introduced (possibly semi-naturalised) on waste ground in a scrub hedge off Bolton Road in Bradford (also v.c.63) (SE165 347, B.A. Tregale, 29/8/09), but this site is being developed as we speak and likely to be lost. There are a few other places where it has been seen, but mainly as a hedge plant (*e.g*. Fig. 1 from Clitheroe), where it is likely to have been introduced and probably planted as native *C. avellana*. This putative hybrid is a taxon that should be looked for and checked when dealing with hazels in general. If they are at least noted as being putative hybrids then records would readily be available should it be shown that they are hybrids at a later date. There is no English name or binomial for this hybrid. The information provided should hopefully encourage recording in some form or another of what might be this 'Hybrid Cob'.

Reference:

STACE, C.A. (2010). *New flora of the British Isles*. 3rd ed. Cambridge University Press, Cambridge.

Cirsium arvense, *C. palustre* and *C. ×celakovskianum*

MIKE WILCOX, *43 Roundwood Glen, Greengates, Bradford, BD10 0HW*; (michaelpw22@hotmail.com)

Creeping Thistle (*Cirsium arvense* (L.) Scop.) and Marsh Thistle (*C. palustre* (L.) Scop.) are common species in the UK, although often in different habitats. Their hybrid, *C. ×celakovskianum* Knaf, is said to be "very scattered in Britain and Ireland" (Stace, 2010). Two questions come to mind: 'Is this more common as a hybrid than records suggest?' and 'Is it an introgressive hybrid?' The following suggests that the answer to both these questions is 'yes'. However, I am not an expert so this phenomenon needs to be studied more closely.

In the key, couplet 5 (Stace, 2010), Marsh Thistle is described as having "stems continuously spiny-winged; biennial with tap-root" and Creeping Thistle (and others) as "stems not winged or with very short wings below each leaf; perennial with at least short rhizomes." The text is much the same, although it says more specifically that Creeping Thistle is not winged. Aspects which can be added to these from the text are that Creeping Thistle (adult plant) is generally a glabrous, bright (but pale) green colour (Fig. 1a-c); and that Marsh Thistle is often densely hairy and often has a purple colouration or stripes in the stems (Fig. 4c). Their hybrid is simply described as "...it has stems winged below but scarcely so above and intermediate in leaves, capitula and corollas."

The situation that I see seems more complicated, in that a progression from one to the other seems to occur and that plants at least intermediate, as described in Stace (2010), are frequent and can be found in most places, and plants closer to either parent can be found. The hybrid, it seems (at least to my eye), can be winged all the way up the stem and range from being sparsely hairy to more densely so, often with some purple colouration in the stems, as in Marsh Thistle (although the capitula/ corollas are more like Creeping Thistle, but can have a purple colouration/stripes). The leaves tend to have a darker hue, (a blue-green colour, although it is not an obvious character until you have seen many). It also seems that the hybrid is quite frequent, often where Marsh Thistle is peripheral and/or not obvious at all in an area and for that reason the range seems to suggest that the hybrids are back-crossing with Creeping Thistle, as there then becomes a range from one to the other, like a hybrid swarm (introgression). Back-crossing to *C. arvense* means the hybrid can be found some distance away from the *C. palustre* parent.

A range of photos is provided (Colour Section, Plates 2 & 3) to show these aspects in Figs. 1-4. There are many more stages in this hybrid, but only a few showing some of the variation and some good hybrids can be illustrated here. It could be difficult to say what the limit is for saying that it is a hybrid, but if it looks like Creeping Thistle but has good wings from one internode to the other for at least half or more of the stem and with some or dense hairs, it should be considered to be a hybrid. There are some which look close to Marsh Thistle and this may suggest a back-cross to that species, but these are very much rarer. Primarily, the plants commonly seen are a range from the glabrous Creeping Thistle to the more spiny-winged, hairy, purple-stemmed Marsh Thistle. It is all speculation and may not be the case, but at least to me it seems that it is frequent and occasionally very locally common in some areas, and that it is an introgressive hybrid, primarily back-crossing to the more common Creeping Thistle.

Reference:

STACE, C.A. (2010). *New flora of the British Isles*. 3rd ed. Cambridge University Press, Cambridge.

Winter sporulation also in *Huperzia selago* (Fir Clubmoss)

BERND SONNBERGER, *Am Wallersteig 13, D-87700 Memmingen, Germany*; (familie.sonnberger@t-online.de)

In October 2008, while investigating winter sporulation of *Lycopodium annotinum* L. (Interrupted Clubmoss) in a population near Memmingen, Southern Bavaria, Germany (site 1, described in Sonnberger, Śliwińska-Wyrzychowska & Bogdanowicz, 2008), two specimens of *Huperzia selago* L. (Fir Clubmoss) with young, just developing sporangia were also found. On 25th April 2009, a copiously sporulating population of that species was observed near the town of Oberstaufen in the Bavarian Alps at 976 m elevation. Eventually, winter sporulation in *Huperzia selago* was confirmed in winter 2012/13 by systematic observation of a population near the village of Dietmannsried (Oberallgäu, Bavaria, 47° 49' 33'' N, 10° 16' 5'' E, 690 m) (see Colour Section, Plate 4). In the same way as *Lycopodium annotinum*, growing close-by, *Huperzia selago* also formed numerous new sporophorous shoots just after completion of summer sporulation in September. They developed during the whole winter and reached maturity at the beginning of April. As already observed previously in *Lycopodium annotinum*, periods of frost and snow caused only a temporary interruption, but not any real impairment of the development of winter sporangia. The eventual maturing time depends on the character of the respective winter. In the comparatively mild winter of 2007/08 sporulation took place in February, while in the severe winter of 2012/13, as well as at higher altitudes, it was shifted to March/April.

I would like to repeat here our appeal from 2008 for botanists to report similar observations in the British Isles. It would be interesting not only to confirm its occurrence, but also the *absence* of the phenomenon, as this might be an indication of genetic differences between British and continental populations.

Reference:

SONNBERGER, B., ŚLIWIŃSKA-WYRZYCHOWSKA, A. & BOGDANOWICZ, M. (2008). 'Sporulation of *Lycopodium annotinum* L. in winter'. *BSBI News*, **109**: 27.

Sea Buckthorn *Hippophae rhamnoides* – do different?

SIMON HARRAP, *1 Holt Road, Edgefield, Norfolk, NR24 2RP*; (simon@norfolknature.co.uk)

In the course of preparing the text and photos for *Harrap's wild flowers*, I was keen to describe and photograph the flowers of plants with inconspicuous inflorescences, blooms that were often overlooked because they are hard to find and /or not important to the identification process. Of course, I checked my descriptions and pictures against the standard references, especially Stace 3, and came across the following. *Hippophae rhamnoides* (Sea Buckthorn) is the only member of the genus in the British flora and, indeed, the only member of the family Elaeagnaceae native to Britain. The family description in Stace 3 states: "... sepals 2 or 4, fused below; petals 0; stamens as many as sepals, inserted on base of calyx-tube;...". The genus *Hippophae* has dioecious flowers "appearing before leaves" (a key character), while the description of the genus states "... sepals and stamens 2."

The flowers of Sea Buckthorn are quite hard to find – who wants to poke around in a near-bare, long-spined bush on a cold, windswept cliff top? Nevertheless, I studied the extensive populations at Cromer in north-east Norfolk on 27th March 2010, before any leaves had appeared, but could find no flowers. It was only on a return visit on 7th April 2011, when the leaves had well and truly burst their buds, that I could find any flowers. This brings me to my first point. The female flower buds are very small and well hidden at the base of the leaf buds. The female flowers, visible as a long, golden stigma emerging from the tiny,

pouch-like calyx tube, are only visible *after* the leaf buds have burst and the leaves have started to expand. The female flowers thus appear *with* the leaves (see photo, inside front cover). The male flowers are in a similar position at the base of the leaves, but in bud they are larger than the female flowers and more visible among the leaf buds, and start to open almost as soon as the leaves, but I would still not interpret this as 'before leaves'.

This leads me to my second, and more substantive, point. My 2011 photographs appeared to show the male flowers with two flap-like sepals surrounding four stamens, each with a very short filament and rather longer anther. It was hard to be absolutely sure from the photos, however, so in 2013 I returned to the cliffs at Cromer to have a close look at the flowers. On 22nd April the male flowers were only just opening and, indeed, every flower that I examined had four stamens (see photo front cover). I have not had a chance to check Sea Buckthorn flowers in different parts of the country, but, in Norfolk at least, male Sea Buckthorn flowers appear to always have two sepals and four anthers, in contradiction to both the family and genus diagnosis in Stace 3. 'Do different?' I suspect not, for the illustration of the male flower of *Hippophae rhamnoides* in Stella Ross-Craig's fabulous *Drawings of British plants* (part XXVI, plate 31) clearly shows four stamens too.

Polycarpon tetraphyllum (Four-leaved Allseed) established in South Essex, and some interesting plants nearby

MARY SMITH, *33 Gaynes Park Road, Upminster, Essex, RM14 2HJ*; (mary@smith33gpr.fsnet.co.uk)

In the summer of 2012, I was botanising in an area not far from my home around Aveley in South Essex (v.c.18). Aveley is a growing town about four miles north of the Thames and just inside the M25, in the local authority of Thurrock. The relevant monads are TQ5580 and TQ5680. I knew there were a few newish housing estates around the town, which I had never before looked at, but last year I did. I was amazed to find huge numbers of *Polycarpon tetraphyllum* (Four-leaved Allseed). One particular small estate probably had many hundreds, or even thousands, of plants. I recognised it immediately, as I have come across it many times in southern France, where it often grows on gravelly or sandy places by paths or other areas where competition is low.

The habitat in which this plant was thriving was an estate built about 15 to 20 years ago. It was built as high-density housing, with a mixture of modest houses and some flats, all by one curling road, making the whole estate one cul-de-sac. The homes are all made of the same kind of brick, as are also the pavements, which mostly go right to the walls of the homes. For these paved surfaces, the bricks were laid with sand between, to allow rain water to drain away. In the sandy cracks grew many hundreds of plants of the *Polycarpon* (see photo. Colour Section, plate 4). Many were single plants, but there were small groups as well. Most of the plants were totally flat on the bricks, as they were walked on, but some managed to live vertically, when they made tufts in corners where feet did not go. They all produced vast numbers of seeds, regardless of where they were growing, all over this estate.

Plants growing with these were thinly scattered. *Polycarpon* was the dominant plant by a long way. Others were mainly: *Poa annua* (Annual Meadow-grass), *Sagina apetala* (Annual Pearlwort) and *S. procumbens* (Procumbent Pearlwort), *Vulpia myuros* (Rat's-tail Fescue), *Bromus hordeaceus* (Soft-brome) (tiny), *Stellaria media* (Chickweed), *Filago vulgaris* (Common Cudweed), *Catapodium rigidum* (Fern-grass) and a very few others. All these are very common in this part of v.c.18, on our sandy or gravelly soils.

It looked very much as though these plants of *Polycarpon* were flourishing here, and had been for some time. A few plants were not in

this habitat of bricks, but had managed to grow nearby at edges of crumbling tarmac, edges of thin grassy patches, and on small waste patches of soil with few rivals. Two nearby roads in an adjacent estate had a few dozen plants each too. This makes it seem to me that they have been here for some years, self-sowing. When I reported this in 2012 to Dr Mark Spencer (Natural History Museum, and Plant Recorder for the London Natural History Society) he was not too surprised, as he knew of two areas elsewhere in or close to London where this same plant is definitely 'established' rather than just 'casual', as the standard texts say. Then Mr David Pearman added that in other parts of the country too (Marazion, Newquay, Poole) there are long-established populations in pavement cracks, echoing what is so common elsewhere in Europe.

So this has made a third established colony close to London. A few plants from the Aveley colony are now in Herb NHM.

I am baffled as to where these plants had come from. A very familiar occurrence is single plants from seeds from faraway places that 'fall off' the M25 as container lorries speed along from much of Europe. There were far too many plants for that, and anyway these plants were far enough upwind *i.e.* west of it, such that the M25 did not seem to be a likely source. Bricks are still made in the UK, and the firing process, either here or abroad, must pretty much guarantee that bricks were not a source of seeds. The sand could have carried seeds, but sand and gravels have been for many decades, and still are currently being, dug up in many nearby parts of South Essex, with a couple of quarries being within a few miles of Aveley. Local pits do not have *Polycarpon* in, and yes, I have looked. It would therefore seem to be pretty unlikely that sand would have been imported from southern Europe. That is where I get stuck, and am baffled. Any suggestions welcome!

With global warming, we get more aliens from the Mediterranean region every year into our wild flora, many as garden escapes, and others from foreign transport, as on the M25. South Essex is the driest part of the UK, and also one of the warmest in summer, so the climate here is more like that of the Mediterranean region than the rest of the UK. A few years ago, we had a plant of *Ferula communis* (Giant Fennel) very close to the M25, and this kind of thing is increasing. So maybe *Polycarpon* is merely another one to become established in a habitat not very different from where it grows naturally.

Other more surprising plants I found in or close to Aveley in 2012 were two native saltmarsh plants, both Nationally Scarce. The habitats in and around Aveley bear no resemblance to saltmarsh. One was a sizeable shrub of *Suaeda vera* (Shrubby Seablite) growing on the bank of the A13, but several metres up the bank, not in the salty gutter where other coastal plants grow. It was surrounded by ruderals such as *Rubus* spp., especially *R. armeniacus* (Himalayan Giant), *Cirsium vulgare* (Spear Thistle), *Artemisia vulgaris* (Mugwort), and *Hirschfeldia incana* (Hoary Mustard), all of broadly similar height to the *S. vera*. It must have been several years old. This grows on the Essex coast in several places, mainly in the north of the county. A piece of this plant is in Herb NHM too.

Another similar surprise was finding *Limonium humile* (Lax-flowered Sea-lavender) in the same estate as supports the *Polycarpon*, but, unlike the latter taxon, there were only a few plants of the *Limonium*, and all were close together in one home's piece of paving. This also grows along the Essex coast, but is scattered. It was growing in Aveley with plenty of *Polycarpon*. I am very grateful to Dr Laurie Boorman, BSBI *Limonium* referee, for the identification of this plant, as I know I have difficulties with *Limonium*. By the time you read this, a piece of it should also be in Herb NHM.

I am also very grateful to David Pearman for his encouragement and suggestions.

English names of wild flowers – reflections on its origin

DR STEPHEN L. JURY, *Honorary Research Fellow, School of Biological Sciences, University of Reading, & 3 Grove Road, Leighton Buzzard, Bedfordshire, LU7 1SF*; (stephenjury21@btinternet.com)

I well remember attending a BSBI Publications Committee meeting in the 1980s, discussing the need for the continued availability of this book, *English names of wild flowers*, by J.G. Dony, F.H. Perring and the then late C.M. Robb, the second edition, reprinted with corrections in 1980. The work simply aimed to stop vernacular names being made up for use in publications or inappropriate local ones chosen. However, this was out-of-date as far as Latin names were concerned, following the recent publication in 1981 of a third edition of the popular *Excursion flora of the British Isles* by A.R. Clapham, T.G. Tutin and E.F. Warburg. This new edition had incorporated the nomenclature of *Flora Europaea*. The last volume, no. 5 (Monocotyledons), was published in 1980, though Professor Tom Tutin had had access to FE's manuscripts as they arrived from authors or editors and circulated as stage I or II accounts. The first work to systematically treat the plants of Europe on a continental scale, *Flora Europaea* necessitated a considerable number of new taxa and combinations to be published, mostly in a series of 20 *Notulae systematicae ad floram Europaeam spectantes*, plus an *Addenda et corrigenda* in *Feddes repertorium* and in the *Botanical Journal of the Linnnean Society*, all later conveniently republished in an indexed book by Koeltz Scientific Books.

At the Publications Committee meeting, it seemed that *English names* was just going to be reprinted, so I volunteered to do the work to revise it, adding in all the extra species mentioned in CTW's *Excursion Flora*. Thus, I was replacing C.M. Robb on a Committee with Dony and Perring, although I did not realise this at the time. I was briefed in the system by Franklyn and the three of us met regularly in John Dony's Luton bungalow to consider my revised portions. There were usually several English vernacular names available for each additional species and we formally voted on them, and as we were not allowed to abstain, a result was consistently achieved! It did not prove necessary to invent any English vernacular names, though a few were translated from other languages, if I remember correctly. I believe drafts were shown by Franklyn to the conservation agencies, and we were requested not to change any names, as a number were included in legislation (I believe in conjunction with herbicide treatments) and this would have caused problems.

CTW's new *Excursion flora* also contained many new additions of species that had become established or naturalised in the British Isles. People from abroad and resident in the UK had to have lived here for 25 years before applying for citizenship (with an advert in the local press from their solicitor, in case there were any irregularities, rather like banns of marriage). CTW required these new accessions similarly to have lived and reproduced in the wild for 25 years before acceptance into their flora. Professor Clive Stace, however, had a much more useful approach, saying that if you found a plant in the wild that looked as if it belonged there and had obviously not been planted, then you should be able to identify it in your flora, and thus he included many more taxa in his *New flora of the British Isles* and later in his reduced *Field flora of the British Isles* (1999). Clive took on board *English names of wild flowers* and found others for his additional taxa, and his *New flora of the British Isles* very effectively replaces *English names of wild flowers*.

Like some recent *BSBI News* authors, I did not like some of the restrictive and in some cases unnecessary 'house rules' (outlined in the Introduction), but of course I was always outvoted by Dony and Perring, and thus obliged to follow them.

Rupert Wilson, an excellent and very computer literate technician in the School of Plant Sciences at the time, entered the names

into our Sirius computer and wrote a suitable programme to generate the English to Latin section, though cross references were added manually by me. Camera-ready copy was produced on our herbarium computer system, using a daisy-wheel printer and carbon-film ribbon. The BSBI Treasurer, the late Mike Walpole, accepted the quote I obtained from the Printing Department of the University of Reading's College of Estate Management. Two thousand copies were printed, but unfortunately pages 43 and 55 were transposed and the book was reprinted at no cost to the BSBI. I was allowed to keep some of the incorrect first edition for use in Reading and for exchange for foreign literature for our herbarium. Sadly, all such incorrect copies are long gone. Students could xerox the transposed pages and glue them in to produce a usable book.

In response to "April-fooled by pink Primroses: the case of the 'ergastofigofyt'"

HARRY E. CLARKE, *70 Norwood Road, Effingham, Leatherhead, Surrey, KT24 5NX*; (harry@harryclarke.me.uk)

An interesting point of the article by T. McCloughlin and Z. Chocholoušková (*BSBI News*, **123**: 51-4) was to compare the RGB values of various pink Primroses. However, the approach used to obtain the RGB values is questionable. The RGB value is calculated from the sensor readings, either in camera or in computer, depending whether JPEG/TIFF or RAW format was used to capture the image. Adjusting the aperture size effects the depth of field of view, it will not affect the resulting RGB value, assuming correct exposure. The colour temperature, which is dependent on the lighting of the subject, does significantly alter the colour of the subject from too red to too blue. To properly compensate, the white balance has to be set, so that an 18% grey card would provide the same RGB value under all lighting conditions. With film cameras, this adjustment had to be done with different films and filters. Digital cameras can estimate this from the scene, and in most cases make a reasonable guess at the correct value. When the RGB value is calculated, the White Balance is used to adjust the sensor readings to produce the correct colour. This is fine for general snaps. However, to obtain accurate RGB values for comparison purposes, the White Balance has to be properly measured. There are a number of different techniques for doing this. Another photograph of a calibrated colour chart can be taken under the same lighting conditions, and then the colours adjusted in computer. Alternatively, some cameras allow the White Balance to be pre-set, which is my preferred method. In addition, instead of using natural, but very variable lighting, fixed lighting can be used (*e.g.* studio lighting). Flash could be used, but is tricky to achieve good results in the field. Another factor to take into account is the pixel size within the sensor. If the pixel size is too small (such as in cheap cameras), the sensor will record the red and blue components of the light differently. A detailed camera review will test how well the sensor accurately records the colour of the subject.

In conclusion, to compare RGB values, either constant lighting needs to be used, or the lighting needs to be calibrated so as to produce the same results. The camera sensor also needs to have the capability to record accurate colours.

Growing in my garden are varieties of *Primula vulgaris* (Primrose), which I guess were originally obtained from a garden centre before I moved into my house 14 years ago. They naturally seed themselves around my garden, usually into my lawn. The predominant colour is yellow, but there are some pink and mauve ones. A few years ago I planted *Primula veris* (Cowslip) into the garden, which started to spread. This year, growing in my lawn was what appeared to be a natural cross between the two, one with yellow flowers, and the other with mauve flowers. The flowers were the size of *Primula vulgaris*, but with several flowers on a single stalk. There are no *Polyanthus* growing near-by that I am aware of. The non-yellow forms seem to be persistent.

Where is Butterbur native in Britain?

MICHAEL BRAITHWAITE, *Clarilaw Farmhouse, Hawick, Berwickshire, TD9 8PT*; (mebraithwaite@btinternet.com)

Petasites hybridus (Butterbur) is such a widespread and familiar plant that there has been a hesitancy to query its origin in county floras, despite the widely cited phenomenon that the male and female plants of this largely dioecious species have contrasting distributions. This article airs some of the issues regarding its origins.

Butterbur was very much a 'must have' plant for country folk in the past, before botanical records started to be made. It had three distinct uses. Firstly, it was much valued as a source of early-season nectar for bees. Only the male plants have any value for this purpose. Honey was much more highly valued than it is now, in the days before sugar was generally available. Sugar was regarded as a 'fine spice' in medieval times and was imported from India, where it was extracted from sugar cane. Only after 1500 did sugar cane begin to be grown in the West Indies, soon followed by the dramatic development of a global industry in sugar. So ordinary folk in times past only had access to a little honey and no sugar. No wonder they used plants like *Myrrhis odorata* (Sweet Cicely), with its sweet aniseed flavour, to stew with their gooseberries.

Secondly, the huge leaves of Butterbur were used as wrapping paper, notably for butter but no doubt for many other purposes, such as wrapping a farm worker's lunchtime 'piece' for slipping into a shoulder bag to avoid being burdened by a basket. There is no other long-established plant in the British flora with leaves anything like the size of Butterbur's. We have plastic bags and our parents or grandparents had brown paper or newspaper, but in earlier times paper was a scarce commodity and those who did buy expensive newspapers acquired something far removed from the massive productions we know today. Cloth was often used instead, but was not disposable.

Thirdly, Butterbur was much used as a medicinal herb. The large rhizomes were dried and extracts were used to treat fevers and other complaints. While most of its uses have not been supported by modern medical research, some of its active ingredients have been shown to be very effective in preventing and reducing the pain associated with migraines and relieving the symptoms of asthma (English, 2002).

With all these uses, it is no wonder that Butterbur was widely planted in a suitable spot by the burn near farmsteads and settlements. In Berwickshire, I have frequently observed the furthest upstream colony of Butterbur to lie in just such a spot (see fig. 3 p. 26). A neat example is at Marchmont (NT74), where a burn runs down through the setting for the large mansion house. The burn follows a relatively wide valley and has wide flushed areas by its banks, where *Adoxa moschatellina* (Moschatel) and *Chrysosplenium alternifolium* (Alternate-leaved Golden-saxifrage) flourish. Unsurprisingly, just below the mansion house these are joined by *Aegopodium podagraria* (Ground-elder), but it is a further kilometre downstream before *Petasites hybridus* occurs. Significantly, this colony of male Butterbur is immediately below Polwarth Kirk, built in 1703 on the site of an earlier church and settlement, and *Myrrhis* also grows at Polwarth, though not by the burn.

However, it is one thing to argue that Butterbur was widely introduced and another to argue that it is not native in some areas: the sources of the introductions might have been quite near at hand in rather more lowland situations. That brings us back to its dioecy. There are no records at all for the female plant in Berwickshire. That does not imply that it is absent there. The tall female inflorescences are very conspicuous during the flowering season in May but at other times of the year the two sexes are indistinguishable. Then one cannot be sure that all recorders have bothered to chronicle the difference. Nevertheless, the imbalance between the sexes is remarkable and is strong evidence against native status,

given the logic for introducing male plants in preference to female plants as a nectar source. Grime *et al.* (1988) state that seed production is abundant where the two sexes coexist, though they observe that vegetative propagation by rhizome fragments is very prevalent.

While female Butterbur is unknown in Berwickshire and Selkirkshire, it does occur elsewhere in the Scottish Borders in Roxburghshire, where it has been recorded by Roderick Corner and myself. It occurs at Bedrule, an old settlement on the Rule Water, which is a tributary of the River Teviot; and further upstream on the Teviot at Branxholme. There are a limited number of additional stations by the Teviot downstream of these two sites to Kelso, where the Teviot joins the River Tweed. Downstream of Kelso it is only known on the English bank of the Tweed at Horncliffe in North Northumberland. How are we to account for these female colonies if Butterbur is not native? There are two possibilities. The female plant is just as good as the male for butter wrapping and as a herbal remedy, so it too could have been passed around in the past. More recently it could have been sold as a curiosity. The other possibility relates to the fact that male Butterbur plants do have a few female florets, which may set a little seed despite the out-breeding requirement and the absence of other plants except those of the same clone. Could not such seed have occasionally dispersed successfully to found new colonies, which presumably would be as likely to be female as male? Once a female plant was present dispersal of rhizome fragments in floods would be inevitable. Seed production in the female florets of 'male' flowers appears to be a rare event. Haratym and Weryszko-Chmielewska (2012) have recently studied the inflorescences of male Butterbur in a male-only population. Their plant material came from the Botanical Garden of the Maria Curie-Skłodowska University in Lublin, Poland. Well-formed ovules were observed in the ovaries of the few female florets. However the plants had been growing in the Botanical Garden for five years and no individuals producing achenes had been recorded over this time.

The situation in Northumberland and Durham is not dissimilar. Swan (1993) maps the female plant showing it to be widespread by the River South Tyne and downstream by the River Tyne, but not the North Tyne, and to have only a few isolated colonies elsewhere. Graham (1988) shows a similar concentration of the female plant in one section of the River Tees, again with only isolated colonies elsewhere. The male plant is almost ubiquitous in both counties. The failure of the female plant to colonise the North Tyne is testimony to the ineffectiveness of seed dispersal in Butterbur and may be evidence that Butterbur is not native in Northumberland.

A study of the habitats of Butterbur is revealing. In general the habitat is the floodplain. I have only once noted a colony in Berwickshire away from the floodplain. That is by the Boondreigh Water in Lauderdale (NT54). There, a small colony grows in a flush at the top of a short but steep bank. The colony is only 50m from the burn and might be an example of wind-blown seed dispersal, but I would suggest that rhizome fragments could have been unwittingly transported that short distance by cattle. Alternatively the colony might once have been continuous from the burnside, with the lower part lost to bank erosion as the burn meandered over the centuries and undercut the bank. Even more tellingly, Butterbur is all but absent from burns and flushes along Berwickshire's cliff-lined coastline, where suitable habitat is much colonised by *Eupatorium cannabinum* (Hemp-agrimony), being confined to the banks of rivers and burns with human settlement. This distribution closely matches that of *Aegopodium podagraria* (Ground-elder), generally agreed to be an archaeophyte (see fig. 1, p. 25), and a much more recent coloniser, *Allium paradoxum* (Few-flowered Garlic) (see fig. 2, p. 26).

George Swan (1993) quotes Dingwall (1976) as claiming that Butterbur is only native in Europe where male and female plants are both common and notes that, if that were true, Butterbur might be native in South Northumberland and only an introduction in North Northumberland. He carefully avoids being

dogmatic on the issue. Grime *et al.* (1988) are among authors who point to the widespread introduction of Butterbur. They note that, in their study of the Sheffield district, *Petasites* had *Myrrhis* as an associate in 73% of the sites sampled. Stace (1991) notes in his flora that female plants seem to be frequent only in northern and central England. An article on the web from Westervoort, Netherlands, states that most plants there derived from a known intentional introduction by a beekeeper. Butterbur is quite widespread in the USA, where it is accepted as being an introduction.

What conclusions can we draw from this discussion? Although there is little direct historical evidence in botanical records, the widespread introduction of Butterbur by man seems to be inescapably established, leaving its native status unclear. For northern England, perhaps all that can be said is that the native distribution, if any, is wholly obscured by introductions. For many other areas, including, I would argue, the Scottish Borders, there is a strong case for treating *Petasites hybridus* (Butterbur) as an archaeophyte.

Postscript

By happy coincidence, soon after this article was drafted, a first vice-county record for female Butterbur has been submitted to me with photos. It was made by Robin Cowe on the Scottish side of the River Tweed just below the Union Bridge (NT95). This fits in neatly with the distribution described above.

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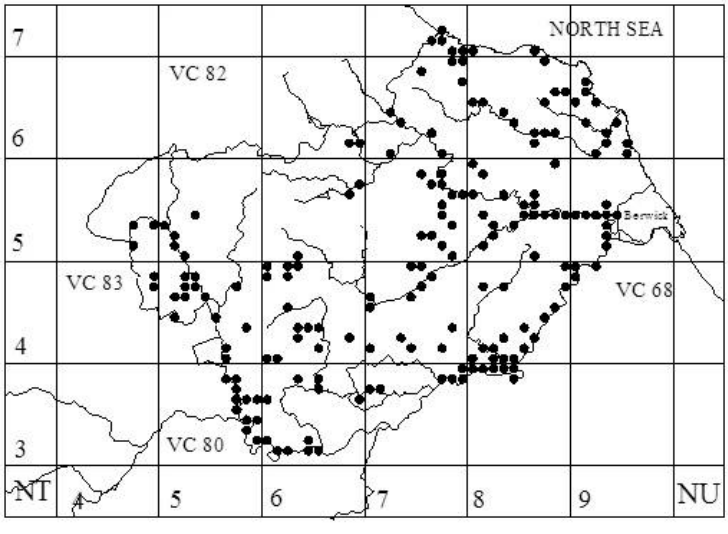

Fig. 1. *Aegopodium podagraria*, Berwickshire (v.c.81)

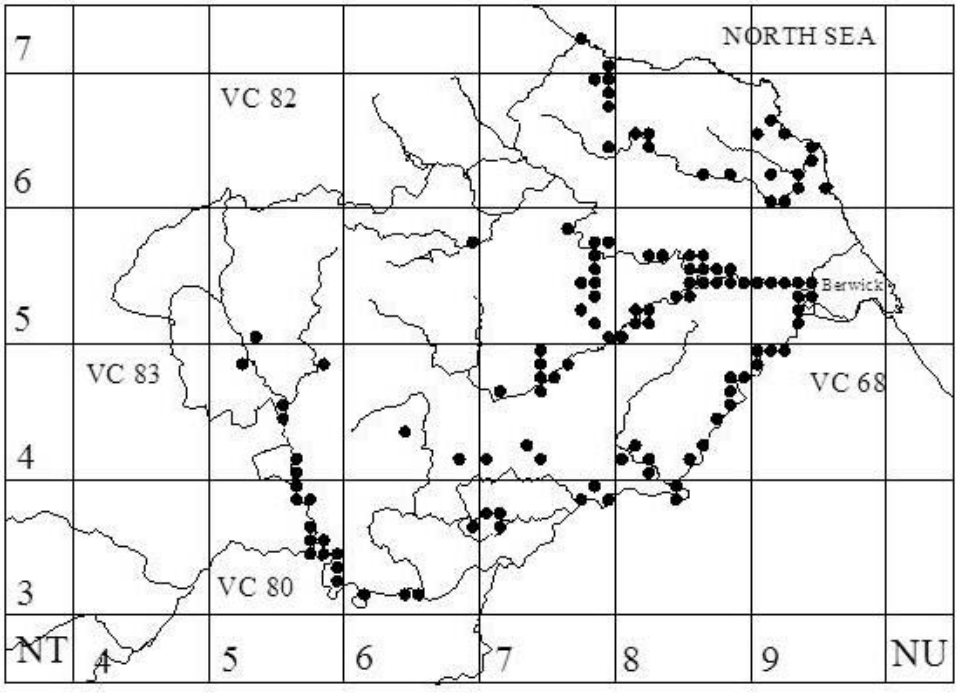

Fig. 2. *Allium paradoxum*, Berwickshire (v.c.81)

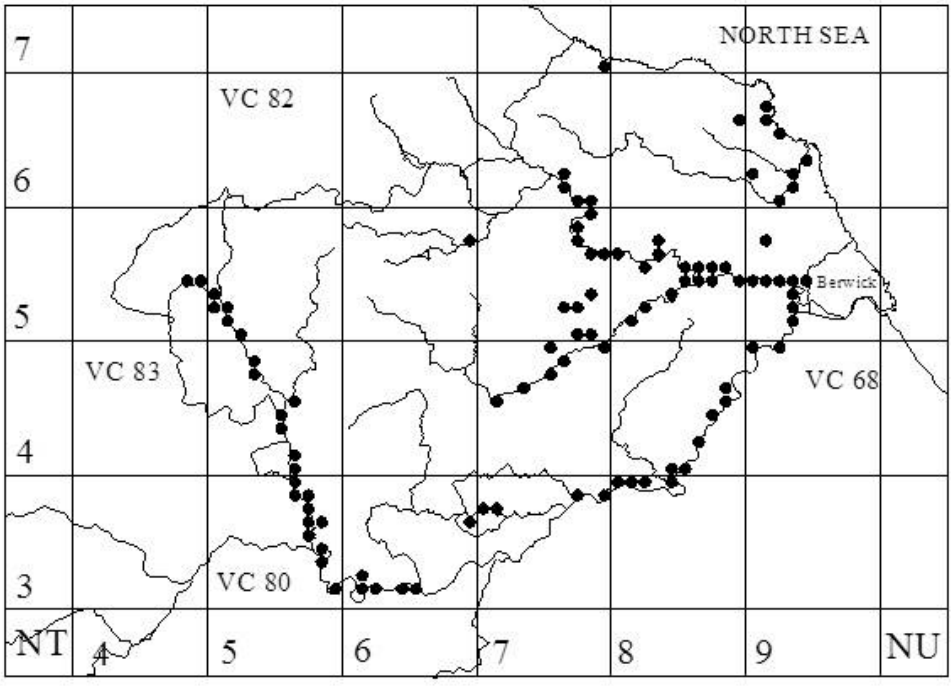

Fig. 3. *Petasites hybridus*, Berwickshire (v.c.81)

Plant extinction rate in Banffshire (v.c.94)

Andy Amphlett, *72 Strathspey Drive, Grantown-on-Spey, PH26 3EY*;
(amphlett@grantownonspey.freeserve.co.uk)

In February 2012, I received an e-mail from Peter Marren, who had been contracted by Plantlife to write a report on extinction rates of vascular plants in vice-counties, updating his earlier study (Marren, 2000). He commented that losses in Banffshire (v.c.94) seemed to be much higher than the average, and asked if I thought this was close to actuality, or was a result of under-recording. I replied that I would have to look at the taxa involved to assess the question of accuracy, but that my checklist of the county (Amphlett, 2010) was available on the BSBI website, in Excel format, and included last dates and status of all taxa, so the calculation of apparent loss would be an easy matter to assess. I also provided an updated version, as some taxa had been re-found recently. Peter thanked me for my feedback, and said that he had passed the information I had provided on to the person undertaking the data analysis.

I heard no more until January 2013, when I received a copy of the report *Our vanishing flora – how wild flowers are disappearing across Britain* (Plantlife, 2012). On page 11 of this report, there is a table of vice-county extinction rates, with Banffshire (v.c.94) at the top, with an extinction rate of 0.90 species per year. Of course, in any league table, someone or somewhere has to come top, but a largely rural county in north-east Scotland, with very extensive upland and montane ground, and a fine wild coastline, seemed an improbable candidate. For Banffshire to have a higher extinction rate than Middlesex and 50% higher than Essex (for example), made me suspect an error. The report gives extinction rates for nine vice-counties or smaller recording units in Scotland. The only other high value was for Berwickshire (0.79), but the vice-county recorder has indicated that the actual figure is much lower, at 0.26 (Braithwaite, 2013). In the seven other areas of Scotland, the Plantlife report gives extinction rates in the range 0.16 – 0.34 (median 0.25), further highlighting the anomalous nature of the value ascribed to Banffshire.

My initial attempts to calculate a v.c.94 extinction rate, using the vice-county checklist, failed to match the figure quoted by Plantlife, my estimate being rather lower. I therefore contacted Plantlife, and Trevor Dines was able to provide the following information. The v.c.94 extinction rate was calculated using the County Rare Plant Register (Amphlett, 2010b), and went back to 1900 as the starting point, giving a 109 year period. (The RPR includes records up to the end of 2009, and using 1900 as the start year, the period is actually 110 years). The analysis methodology adopted was that used by Walker (2003). Within this period, Plantlife identified 62 taxa as going extinct before 1970 and 36 post 1970. This gave 98 extinctions over a 109 year (*sic*.) period, which resulted in the 0.90 extinction rate in the report.

On page 30 of the Plantlife report, groups of taxa excluded from the extinction rate calculation are listed. These are:

- All doubtful or unconfirmed records
- All neophytes
- Any species whose presence might have been ephemeral, casual or of recent provenance – for example, plants introduced as plantings or in 'wild' seed mixtures
- Micro-species of dandelions, hawkweeds and brambles
- All hybrids and taxa that are less than full species (sub-species, forms, varieties etc)
- All species without a date for the last record
- All species last recorded after 1986

An immediately obvious problem is that the Plantlife analysis included archaeophytes, whereas Walker (2003) excluded them. I discuss this below, but for the preliminary analysis I have (to maintain comparability with Plantlife's report) only excluded neophytes, and included qualifying archaeophyte species.

The RPR includes 221 native and archaeophyte taxa last recorded in the period 1900 – 1986, whereas the checklist includes 242 taxa. I commenced my analysis with this longer list of 242 taxa, but subsequently all additional taxa listed in the checklist, compared with the RPR, were removed.

Following the approach take by Plantlife, I removed 85 micro-species; 51 *Hieracium*, 31 *Taraxacum* and three *Rubus*. That left 157 taxa. I then removed 34 hybrids, 31 sub-species and eight varieties, leaving 84 species, 57 native and 27 archaeophyte. Including both native and archaeophyte species, equates to an extinction rate of 0.77 per year (or 0.76 over the actual 110 year period) rather than the 0.90 quoted by Plantlife. As we were using identical data sets to carry out this analysis, I can only conclude that the figure of 0.90 is an error.

In the report, Plantlife define an archaeophyte as a plant that was introduced before 1500AD and has persisted naturally since. Few if any vice-counties are able to lay claim to a history of plant recording that would allow anyone to claim with certainty that an alien species was actually an archaeophyte in that county. In an analogous way to species across Great Britain and Ireland occurring as both native and alien populations, alien species must occur as both archaeophyte and neophyte populations. I suggest that, in Banffshire, any alien species first recorded after Craib's 1912 *Flora* have scant validity to be classed as an archaeophyte.

Of 27 'extinct archaeophytes', I therefore removed seven species first recorded post 1912. One species has been recorded post 1986, a previously over-looked record, leaving 19 archaeophytes. Examining the records of these species, I removed a further five species where there is only a single record, inferring that they were likely to have been of casual occurrence. This approach is in-line with Plantlife's where they also excluded "any species whose presence might have been ephemeral, casual or of recent provenance". That leaves 14 alien species that might have a claim to archaeophyte status in v.c.94 and that were last recorded in the period 1900 – 1986.

I then critically assessed the list of 57 extinct species listed as native in the checklist, removing 13 species. Five species were neophyte aliens, recorded as native in the checklist in error, the re-classification being in line with the species status in Preston *et al*. (2002). Two species were probable introductions; one species was extinct pre-1900 (the post 1900 record being doubtful); two species have been re-found after publication of the checklist, one species was re-found in 2003, but the record has only recently come to light, and one species has a post-1986 record that was previously overlooked. Also, the identification of one species is doubtful. Hence, 44 native extinct species remain for further consideration. Caveats apply to nine of these species, because of possible identification errors, not searched for post-1986 or their occurrence was possibly casual. Of the remaining 35 native species, 11 are submerged aquatics, a group that has not been well-recorded post-1986, six of which have post-1970 records, and two are upland or montane species that may well still be present.

The slightly longer time period, 1900-2012 (113 years) is used to assess the extinction rate. 44 native species going extinct over 113 years = 0.39 species per year. If those species retained but with caveats are excluded the extinction rate falls to 0.31 per year. Some of the remainder, particularly submerged aquatics, are likely to still be present, so more assiduous recording might well reduce the extinction rate further. In the interim, the extinction rate of native species in v.c.94 can be stated to be a maximum of 0.39 per year.

In line with the approach taken by Walker (2003), I prefer to exclude archaeophyte species from extinction rate calculations. But to provide a figure comparable with that quoted by Plantlife, the 14 alien species that have gone extinct in v.c.94, and that have some claim to archaeophyte status in the vice-county, equates to an extinction rate of 0.12 per year. Combining that with the figure for native species, gives a combined maximum extinction rate of 0.51 per year. The figure of 0.90 given in the Plantlife report is therefore shown to be far too high.

The extinction rate for native species in Banffshire (maximum 0.39 per year) is very close to the mean reported for nine vice-counties in England and Wales north and west of the Tees-Exe line (0.41) (Walker, 2003). The re-calculated figure for Banffshire remains high compared with other Scottish vice-counties listed by Plantlife, but whether that is an accurate reflection of the situation is not known. Additional field work in Banffshire is likely to reduce the calculated extinction rate further. Nevertheless, it is possible that the plant extinction rate in Banffshire has been relatively high in a Scottish context.

It remains to echo the concluding comments of Walker (2003) that despite the corrections and caveats contained in this note, the records do suggest a period of heightened plant extinction in the 20th Century in the county. But if such analyses are to be presented, then we must ensure, as far as is practical, the correct use of the available data, and acknowledge the inherent problems that the study of local extinction inevitably presents.

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Scrophularia scorodonia (Balm-leaved Figwort) at Newhaven

Matthew Berry, *Flat 2, 11 Southfields Road, Eastbourne, East Sussex, BN21 1BU*

On 4th September 2012, whilst recording around an industrial estate in Newhaven (v.c.14), I wandered into the car park of a transport café and noticed some unfamiliar-looking plants growing on the other side of a metal fence. The plants had figwort-type inflorescences and leaves of a colour and texture somewhat reminiscent of *Teucrium scorodonia* (Wood Sage). I suspected that they were *Scrophularia scorodonia* (Balm-leaved Figwort), and this proved to be the case on closer examination. There was a small colony of about half a dozen plants, up to a metre or so tall, growing in the yard of an aggregate supplier (TQ4487001620). There was also an isolated plant growing in fenced rough ground a little further up the road.

This species has apparently been showing signs of eastward spread along the south coast of England, a phenomenon that has added to doubts about its status as a British native. For example, it was reported for the first time in South Hampshire relatively recently. If this expansion is genuine, it raises the problem of how the plant is being spread. In the case of the Newhaven site, it is tempting to assume that it has been brought in with sand, gravel, broken stone, or some other material used by the aggregate supplier; or at least that its presence is in part due to some activity carried out on the industrial estate. For other new sites, it has been suggested that seeds might have been carried in the sea.

The question of whether *S. scorodonia* is an alien plant being spread by human agency (or

some other means), or a true native eking out a weedy existence in ruderal habitats, might be difficult to settle finally. It depends on how you define an 'alien'.

To my knowledge, this is the first record of the species in Sussex. Judging by its robust, yet weedy habit, and its occurrence here in an undistinguished habitat, it will not be the last.

Acknowledgement:
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Scrophularia scorodonia var. *viridiflora* (Balm-leaved Figwort)

PHIL PULLEN, *95 Yealmpstone Drive, Plymouth, Devon, PL7 1HE*; (phil_pullen@hotmail.com)
PETER REAY, Crooked Fir, Moorland Park, South Brent, Devon, TQ10 9AS

Clive Stace, in his *New flora of the British Isles*, 3rd edition (2010), mentions that two species of *Scrophularia* sometimes have greenish flowers – *S. nodosa* (Common Figwort) and *S. auriculata* (Water Figwort); but there is no mention of such flowers in *S. scorodonia* (Balm-leaved Figwort).

In early June of this year (2013), we found several *Scrophularia* plants at South Brent, South Devon, (SX698592) growing in a very sheltered, moist wooded area under a viaduct of the main A38 Exeter to Plymouth road. Most of the plants were *S. auriculata* but a few, not yet in flower, had the typical leaf shape and hairiness of *S. scorodonia*, but were somewhat paler in colour. This attracted our interest at once because *S. scorodonia* is not usually found in South Devon growing away from the coast and we suspected a new hectad record. Returning later, when the plants had begun to flower, we were both satisfied that they were indeed *S. scorodonia*. Tim Rich (National Museum Wales) viewed our photos of *S. scorodonia* on the iSpot website and agreed with the identification. Now we turned our attention to the puzzling colour of their flowers. Growing alongside a plant with normal purplish-coloured flowers were two plants with pale, greenish flowers. All the plants were well over the 1m height mentioned in Stace, but we were not too surprised at this, as the wooded valley was exceptionally sheltered and all the vegetation was lush. The two green-flowered plants were 1.20 and 2.05 m tall, and the normal-flowered one was 1.65 m. See photos inside back cover.

Interested to find out more about these unusual green-flowered plants, PP searched several floras without finding any mention of them. Then Ian Bennallick, BSBI Recorder for East Cornwall, provided the answer. He emailed: "I think it is var. *viridiflora* Druce. It is mentioned for Par in Thurston and Vigurs, 1922. I found plants with green flowers at St Dennis Junction, edge of Goss Moor in the 1990s. I don't know where it came from; I certainly didn't plant it, but I have *Scrophularia scorodonia* in several spots in the garden, edge of the field, orchard *etc*. At least two plants are var. *viridiflora*, but it is not just the flowers that are green, the whole plant appears to be devoid of any of the reddish colouring. I think it may be present in large populations?"

A search of the Web revealed online the Supplement to F. Hamilton Davey's *Flora of Cornwall*, by Thurston and Vigurs (1922) in which, on p. 99, it states : "var. *viridiflora* Druce. Pure green flowers and paler foliage, railway embankment near Par Sands, growing with the type, 1917, Miss M. Cobbe, B.E.C., 1917, p39." Luckily, the B.E.C. (Botanical Exchange Club) Reports can be read on the BSBI website and this confirmed the record.

The name *Scrophularia scorodonia* var. *viridiflora* also crops up in more recent accounts as a Google search will reveal. In the *Report and Transactions of the Cardiff Naturalists' Society*, LXXXV, 1955-56, amongst "Glamorgan Botanical Notes, 1956", there occurs the record, which can be read online: "*Scrophularia scorodonia* L. var. *viridiflora* Dr., Railway bank, Cardiff Docks,

R.L. Smith and A.E. Wade." More recent still, there is another record in the *Wild Flower Society Magazine*. Again, this can be read online. Paul Green describes a Cornish meeting on 18th June 2004 and says: "The afternoon was spent on Goss Moor…The normal form of *Scrophularia scorodonia* (Balm-leaved Figwort) with red flowers was compared to plants with green flowers (var. *viridiflora*)".

Thus, although there have been previous records of this variety of *S. scorodonia* in Cornwall and South Wales, the plants at South Brent were thought to be the first record for Devon. Perhaps surprisingly, it has not yet been noticed in the stronghold of the species around Kingsbridge (Gordon Waterhouse, pers. comm.), but it now appears that plants fitting the description of var. *viridiflora* were noted during a survey of National Trust land at Wembury (in SX5048) around 2008 (Mike Ingram, pers.comm.).

Perhaps in the next edition of Stace's *New flora*, if there is to be one, *Scrophularia scorodonia* will merit a mention as a plant that 'sometimes has greenish flowers'; and the maximum height should perhaps be doubled from the current 1 m to over 2!

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The identity of *Scrophularia ×hurstii* Druce

M. WILCOX, *43 Roundwood Glen, Greengates, Bradford, BD10 0HW*; (michaelpw22@hotmail.com)

In the past, a hybrid has been suggested between *Scrophularia auriculata* (Water Figwort) and *S. umbrosa* (Green Figwort): *Scrophularia ×hurstii* Druce, collected by Hurst, for v.c.8 (Druce, 1916) and Praeger (1951) for Ireland, H21 and H33 (Stace, 1975), with specimens in **OXF** (Oxford) and **DBN** (Dublin) respectively. The **OXF** plants were considered to be one or the other parent by Goddijn & Goethart (1931 *in sched.*), stating that they did not resemble artificial hybrids between the two, which were "intermediate and almost absolutely sterile". However, Vaarama & Hiirsalmi (1967) said that some artificial hybrids of *S. umbrosa* (2n=26) × *S. aquatica* [*auriculata*] (2n=78) were fertile, being 2n=52, and resembled *S. umbrosa*. They suggested plants of this sort could have arisen in the wild. Stace (1975) also suggested the wild plants (**OXF**) were one or the other parent and that one pair appears diseased. *S. umbrosa* counts are given as 2n=26, 52, with *S. auriculata* given as 2n=*c*.40, 78, 80 (Stace, 1975), but 2n=78, 80 (Stace, 2010).

An examination of two pairs of specimens in the Oxford herbarium (**OXF**) of the plants named *Scrophularia ×hurstii* Druce, noted in Stace (1975), revealed that the specimens appear not to be of hybrid origin (as is also suggested in the cited work). The plants were originally collected in October 1915 at Shalbourn, Berks., by C.P. Hurst. In Stace (1975) two were said to appear "to be normal *S. umbrosa*" and two were said to be "affected by mildew with malformed inflorescences", said to have no flowers present "but all specimens bear well-formed fruit and seeds". However, Goddijn & Goethart in 1931 annotated the **OXF** sheets, stating they were normal or diseased plants of *S. umbrosa*, suggesting all four specimens were this taxon (Stace, 1975). Two specimens, **OXF**: 00003032 and 00003033, are in fruit but no flowers are present that can be viewed for the shape of the staminode. However, at least one of this pair has 'auricles' on the petiole of one of the leaves. It is distinctly fertile (fig. 1) and is clearly *S. auriculata* rather than *S. umbrosa*.

Fig.1. *Scrophularia auriculata*, **OXF**: 00003033; showing normal fertile ± orbicular capsules.

The other specimen, 00003032, in the same condition, is also *S. auriculata*. The other two plants referred to as being diseased with mildew 'appear' to be fertile but only a few flowers are present. These plants are **OXF**: 00003034 and 00003035. The congested, malformed inflorescences appear, as suggested, to be diseased in some way, possibly by mildew.

Fig. 2. *Scrophularia umbrosa*, **OXF**: 00003035; elongated capsules, affected by an unknown agent.

The fruits are extremely abnormal for *Scrophularia* (fig. 2). They should be orbicular-suborbicular (fig. 1) and the abnormal capsules may be affected by a fungal infection or by another unknown agent, for example, elongated capsules in some sedges can be caused by midges (see Jermy *et. al*., 2007, p. 24).

Two or three of the malformed capsules were opened to see if anything could be found, but there were no obvious signs of the cause. However, the placentas were in the top of the fruit and not attached to the receptacle. In Stace (1975) they were said to have seeds, but no seeds were developed in these infected capsules (but there appear to be a few flowers that were not affected and some have developed a more normal capsule and seeds, although these were very few compared with the affected ones). However, as there were a few fairly normal flowers present, it was possible to look at the staminode by soaking them and teasing them open. The staminodes are quite normal for *S. umbrosa* and not malformed. These two plants are undoubtedly *S. umbrosa* and have been affected by an unknown agent and are mostly infertile because of it.

Scrophularia ×hurstii was also said to have been found in Ireland by Praeger (1951), with a specimen for the River Liffey in Dublin, (**DBN**). Praeger's plant from the River Liffey, 1937 (v.c.H21) has no flowers, but it is also a very fertile plant and the large fruiting capsules and general appearance (from a photograph) show that it is *S. auriculata* and apparently not a hybrid. Praeger (1951) stated that the staminode was intermediate, but alas there is no evidence of this, as the plant only has fruits. As Vaarama & Hiirsalmi (1967) made fertile (2n=52) hybrids that looked like *S. umbrosa*, without re-finding the River Liffey plants and finding intermediate characters and possibly a chromosome count, we may never know, but it looks more like *S. auriculata* than *S. umbrosa* in general and should be considered the former. The staminode may help to solve it somewhat if the Irish plants can be refound. The other Praeger record for v.c.H33, Lough Erne, does not have a specimen in **DBN**. It might be worth looking at the River Liffey and the Lough Erne sites to see if there are fertile plants with intermediate staminodes (see below). The **OXF** sheet 00003033 has the Botanical Exchange Club report of Druce (1916) and therefore the name *S. ×hurstii* is placed within the synonymy of *S. auriculata*.

An artificial hybrid, made by the author, with *S. umbrosa* (female) × *S. auriculata*, is likely to have been with *S. umbrosa* 2n=52 × *S. auriculata* 2n=78, as a chromosome count of 2n=c.65/66 has been made, (Bailey, unpubl.) (yet to be fully determined, but likely to be 2n=65, these plants are more or less sterile). The hybrid plants are intermediate, but generally resemble *S. auriculata* in the leaf type (*i.e.* with occasional 'auricles' on the petioles). However, the staminode shape is only relatively intermediate and resembles more closely *S. umbrosa* in shape, although very slightly larger (deeper = height) than either parent (fig. 3).

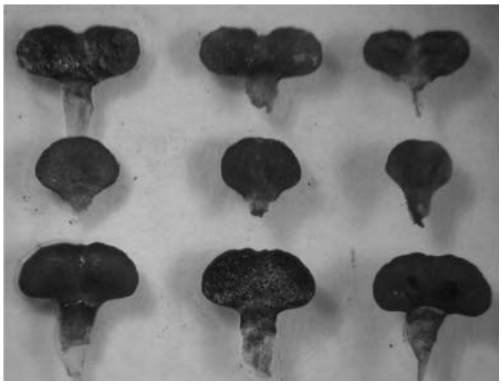

Fig. 3. Staminodes: top row = *Scrophularia umbrosa*; middle = *S. auriculata*; bottom = artificially crossed *S. umbrosa* × *S. auriculata*. M.P. Wilcox, 2009/2010, still in cultivation 2013.

Fertile hybrids would be almost impossible to detect in the wild without careful searching, but plants with similar staminodes to the artificial hybrid (fig. 3) would be worth collecting. The artificial hybrid suggested that the *S. umbrosa* parent was almost certainly 2n=52 and the staminode is normal for that (fertile) parent species (fig. 3). It is possible that, if hybrids exist, sterile hybrids could still be found if looked for. I would be interested in any material (especially from the Irish sites). If possible, please send five to ten flowers and about three to five, more-or-less formed fruiting heads (the oldest) and two to five typical leaves. Look carefully for 'auricles', a pair of small 'leaves' on the petiole of the main leaves (see Rich & Jermy, 1998, p. 257), not a pair of leaflets where the petiole meets the stem. Sometimes it is difficult to find any 'auricles' at all, in which case the staminode should be looked at. Occasionally the leaves of *S. auriculata* can have a small to a larger 'thumb' projecting from the base of the leaf.

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Discovery of the hybrid between *Orchis anthropophora* and *O. simia* (*Orchis ×bergonii*) on the Hampshire downs

MICHAEL R. CHALK, *7 Allendale Avenue, Hants, PO10 7TJ*; (mikechalk2011@hotmail.co.uk)

Introduction

The Monkey Orchid *Orchis simia* is now restricted to three sites in the British Isles, one in Oxfordshire and two in Kent. In the late 1940s, it was rumoured to be more widespread, to include small populations in Surrey and Sussex, although there appears not to be any firm evidence of this, apart from a single flowering plant in Yorkshire. At the second site in Kent, near Faversham on a herb rich chalk hillside, and growing with the Man Orchid *Orchis anthropophora*, the extremely rare hybrid *Orchis ×bergonii* flowered twice between 1985 and 1989. There is still conjecture as to how the hybrid occurred, inadvertent hand pollination being a probable cause.

In June this year, visiting parts of the downs, as I have done for many years, looking for and photographing orchids, I came upon the first group of Man Orchids. My eyes were drawn to one plant almost immediately. This specimen, on closer inspection, showed characteristics of both the Monkey and Man Orchids (see inside front cover). My first thoughts were *O. simia*, because of the pinkish colouring of the rounded and shaped lobes. A description of the plant is as follows:

> Stem green, spindly, 143mm tall; four basal leaves spreading in a rosette, one erect, green, lightly-veined, oval to lanceolate; bracts creamy pink; inflorescence dense, short, with 22 flowers, opening from bottom to top; flowers with hood pale creamy pink, finely spotted inside and veined violet, three lobed, centre creamy, very pale yellow, unspotted, lateral lobes pinkish-violet, two secondary lobes separated by a tooth, lateral and secondary lobes near equally curved, with slight spiral twisting, small pale spur.

There is an absence of a spur on the Man Orchid and the inflorescence is longer. Its flowers open from the bottom to the top. The Monkey Orchid's flowers open from the top of the inflorescence down. The centre lip on the hybrid plant does not display the crimson tufts, but has a more *O. anthropophora* appearance.

After much consideration, the occurrence of this hybrid being natural is doubtful, given the fact that the Monkey Orchid parent does not occur here, so the natural hybridisation process of insect transference of pollen from the anther of one orchid to the stigma of the other I believe has not taken place. One has to look at the possibility of deliberate cross-pollination. Given the number of flowering periods in, say, the last thirteen years, which has only been six, not consecutive, in that time I had not seen any evidence of habitat disturbance of any kind. So if this is the case, over the next few years there will probably not be more hybrid plants, unlike the ongoing and regular occurrence of the Oxfordshire reserve's Lady Orchid *Orchis purpurea* × Monkey Orchid hybrid. Man Orchid × Monkey Orchid is a much rarer occurrence. If this was a natural hybrid, a re-flowering is possible, with the same odds as in a deliberate cross-pollination. Windblown seed should perhaps not be ruled out, given the fact that rare or scarce plants turn up every now and then in places where they have no history. Two recent examples are a Lady Orchid at Beachy Head and Lizard Orchids *Himantoglossum hircinum* near Chichester, both from windblown seed. I could of course fill several pages with scientific and not so scientific conjecture!

On examination of the hybrid two weeks later, the plant did not display swollen ovaries for possible seed production. It is more than likely sterile. I have seen many natural hybrids and identified strange orchid mutations in the field, but I have to say this is a spectacular-looking plant and it is a real thrill to have discovered it. Richard Laurence, friend and fellow orchid enthusiast, was shown the orchid and examined the area. He agreed that it was *Orchis ×bergonii*. The existence of the plant was reported to David Lang.

Acknowledgements:
Special thanks go to Richard Laurence.

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Occurrence of *Trifolium glomeratum* (Clustered Clover) in north-west England

PHILIP H. SMITH, *9 Hayward Court, Watchyard Lane, Formby, Liverpool L37 3QP*; (philsmith1941@tiscali.co.uk)
PATRICIA A. LOCKWOOD, *13 Stanley Road, Formby, Liverpool L37 7AN*

While surveying the vascular plants of roadside verges at Thornbeck Avenue, Hightown, Merseyside (v.c.59: South Lancashire) on 31st May 2013, PAL noticed a patch of a small glabrous clover (*Trifolium*) that neither of us recognised, being clearly different from the nearby *T. striatum* (Knotted Clover). The plant was identified as *T. glomeratum* (Clustered Clover) on the basis of its pinkish-purple, rather flat-topped, sessile flowers, reflexed bracts with a long aristate tip and rounded leaflets with a pale central spot (Fig 1, inside back cover). We re-visited the site on 2nd June 2013 to make a more detailed study of the extent of the plant, its habitat and associates.

Grass verges extend along the east and west sides of Thornbeck Avenue, Hightown, being divided into 20 sections with a total area of about 0.6ha. A central grid reference is SD297034. *T. glomeratum* was found along the entire 520m length of the verges, but was sporadic in occurrence. We identified nine distinct colonies containing 16 patches of the plant with a total area of about 64.6m^2.

The verges were probably established in the late 1960s and 1970s when the housing estate was built on sand-dunes less than 200m from the shore. It is not known whether they were top-soiled or seeded. Management consists of occasional mowing without removal of arisings. It is not thought that fertilisers are used, while herbicide use seems to be restricted to areas around occasional planted trees and street furniture. Soils are evidently sandy, of low fertility, well-drained and susceptible to drought. Indeed, a period of warm, dry weather resulted in the vegetation drying up, with the result that *T. glomeratum* was difficult to find by 7th June 2013.

As at the similar Kenilworth Road verges, Ainsdale (Smith & Lockwood, 2012), species-richness is high, 77 vascular taxa being identified up to 2nd June 2013. The dominant grasses are *Agrostis capillaris* (Common Bent), *Festuca rubra* (Red Fescue), and *Vulpia bromoides* (Squirreltail Fescue), a particular feature being a high diversity and abundance of winter annuals, including much *Trifolium striatum*.

Close vascular associates of *T. glomeratum* are listed in Table 1 (p. 36). Several of these, including *Aira caryophyllea* (Silver Hair-grass), *A. praecox* (Early Hair-grass), *Erodium cicutarium* (Common Stork's-bill), *Trifolium dubium* (Lesser Trefoil), *T. striatum* and *V. bromoides* are given as associates of *T. glomeratum* within its native range by Coombe & Leach in the BSBI Scarce Plant Atlas account (www.BSBI.co.uk).

A scarce winter annual, *T. glomeratum* is typically associated with short, relatively open swards on sandy or stony, well-drained, drought-prone soils, often near the sea. Known habitats include pathside banks, sea-front lawns, cliff slopes, sandy pastures, arable land and Scilly bulb-fields (Pearman, 2002).

Ellenberg indicator values show that the plant is adapted to full light (L = 9), dry sites (F = 3), moderately acid and rather infertile soils (R = 5; N = 2), and is absent from saline sites (S = 0) (Hill *et al*., 2004). These require-

ments accord with the habitat conditions at Hightown.

As a native species, *T. glomeratum* is known mainly from the south and east of England, extending from Cornwall to north Norfolk. It is also widely distributed in the Channel Islands, but is highly localised in southern Ireland. A few scattered occurrences northwards to central Scotland are mapped as "alien" (Pearman, 2002), Stace (2010) describing the plant as a "rare casual elsewhere in England".

In north-west England, only one previous record of *T. glomeratum* has come to light; that of Rev. C.E. Shaw, who found it as a woolshoddy casual at Thornham Lane tip, south of Rochdale, Greater Manchester (SD8908, v.c.59) in 1971 (D.P. Earl *in litt*., 2013).

The habitat of *T. glomeratum* at Hightown is evidently similar to its native haunts in southern England. It seems unlikely that seed containing this taxon would have been used on the site and the origin of this population must remain a mystery.

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Table 1. Vascular associates of *Trifolium glomeratum* at Hightown

Taxon	English name	Freq.	Taxon	English name	Freq.
Agrostis capillaris	Common Bent	a	*Ononis repens*	Common Restharrow	o
Aira caryophyllea	Silver Hair-grass	o	*Plantago lanceolata*	Ribwort Plantain	r
Aphanes australis	Slender Parsley-piert	r	*Poa annua*	Annual Meadow-grass	r
Arenaria serpyllifolia	Thyme-leaved Sandwort	r	*Poa humilis*	Spreading Meadow-grass	f
Bellis perennis	Daisy	o	*Sagina* sp.	Pearlwort	r
Bromus hordeaceus	Soft Brome	r	*Sedum acre*	Biting Stonecrop	r
Cerastium diffusum	Sea Mouse-ear	o	*Sherardia arvensis*	Field Madder	r
Dactylis glomerata	Cock's-foot	o	*Taraxacum* agg.	Dandelion	r
Erodium cicutarium	Common Stork's-bill	o	*Trifolium arvense*	Hare's-foot Clover	r
Festuca rubra	Red Fescue	a	*Trifolium dubium*	Lesser Trefoil	a
Geranium molle	Dove's-foot Crane's-bill	o	*Trifolium micranthum*	Slender Trefoil	r
Holcus lanatus	Yorkshire-fog	r	*Trifolium striatum*	Knotted Clover	o
Leontodon saxatile	Lesser Hawkbit	o	*Veronica arvensis*	Wall Speedwell	o
Lolium perenne	Perennial Rye-grass	o	*Vulpia bromoides*	Squirreltail Fescue	a

An Englishman in Brittany: James Lloyd (1810-1897)

THOMAS MCCLOUGHLIN, *St. Patrick's College (a college of Dublin City University), Drumcondra, Dublin 9, Ireland*; (thomas.mccloughlin@spd.dcu.ie)

Recently, I had the opportunity to visit the Musée Botanique in the Arboretum Maulévrie in Angers, France and was surprised to learn of the considerable contribution of James Lloyd (Fig.1. and Fig. 2.), an English botanist active in 'Greater Brittany' (an area much larger than the modern Brittany) and taking in the lower Loire region in addition to Brittany 'proper'. The following paragraph is the text from a short guide translated and paraphrased from the French (Angers, 2001) and further information from the "Green Island" program of the Nantes Green Capital of Europe celebrations 2013.

"Born in London, the young James Lloyd came to France with his mother and stepfather. In *collège* (secondary school) he learned quickly, and his loyal and resolute character was already expressed forcefully. He nurtured a growing interest in music and botany, which did not always fit in with the plans of his parents. The family moved to Nantes in 1831 and Lloyd continued his studies at this time, and focused his activity on botany. However in 1841, Lloyd, who had often worked in the Botanic Gardens of Nantes, came to quarrel with the director of the Botanic Gardens, whose job he wanted. It is understood that they quarrelled over differing views concerning the way a botanist works. However, their differing views assumed the character of a fight when the words 'ignorant' and 'prank' were followed by a brawl that lead directly to the courts. The Botanic Gardens barred Lloyd from entering its grounds, who happened to be the greatest botanist in Nantes at the time. It is this event and his friendship with the botanist Alexander Boreau that led Lloyd to later bequeath to the city of Angers (not Nantes) his rich library and herbarium (a collection consisting of 100,000 specimens of 24,000 species) that served as the basis for his publications. The collections are now preserved in the Musée Botanique, Angers. The results of his work led him to write a *Flora of Lower Loire* (Lloyd, 1844). In 1859 (Lloyd, 1859), he described a new species of *Angelica - A. heterocarpa*. The *Flora of Lower Loire* in turn became the *Flora of Western France* (Lloyd, 1886) in five editions that spread over half a century (1844, 1854, 1868, 1886, and 1897). He is also recognised for a few copies of a beautiful '*alguier*' (a 'herbarium' of algae) the most comprehensive so far in France. His pastimes were focused on music and the culture of tulips. The latter passion follows him onto his deathbed when, writing in his English-tinged French, he directed a friend to "passer voir ses fleurs" (*i.e.*, go see her flowers)."

Figure 1. James Lloyd - photograph of portrait in the Musée Botanique, at the arboretum Maulévrie, Angers, France. Uncharacteristically without his glasses. Copy of original by T. McCloughlin, by permission.

Figure 2. James Lloyd - a modern 'portrait' from www.nantesgreencapital.fr

The following is recently gleaned information about Lloyd. He was buried in Nantes in 1897. In Nantes, a street is named after him (Rue James Lloyd, 47°14'46.37"N 1°31'1.32"W) . In addtion, the "Green Island Itinerary" (15th June – 28th September 2013) pictures Lloyd, and the website (www.nantesgreencapital.fr) uses his portrait as a virtual tour guide, which is an interactive urban nature trail based on the Island of Nantes which he studied in detail and on which he discovered *Angelica heterocarpa*. He is not, however, to be found on lists of botanists on the internet, French or otherwise, unless 'Nantes' is included in the search engine.

Angelica heterocarpa (Colour Section, Plate 4) was regarded by Lloyd as a perennial (albeit of often short duration of life of 2-3 years), and a "hemicryptophyte". Its formal description is as follows (translated from https://fr.wikipedia.org/wiki/Angelica_heterocarpa):

> Stem 1 - 2m (exceptionally up to 3m), very deeply grooved, smooth, except at the top where rough-hairy. Very large leaves, 2-3 times pinnate, radical stalked with spine gutter and petioles widely dilated at the base, sometimes with a reddish sheath, leaflets ovate-lanceolate, darker and shiny on top, saw-toothed, ending in a rough whitish point. (When the winter is mild, the leaves persist throughout the year). The leaflet dimensions are 10 × 3cm. Umbels: many rays, striped, rough-hairy. Involucre none, or 1-3 leaflets more or less obsolete, the leaflets thereon linear. White flowers, small, oval with tip bent (flowering from July to August, with a few late bloomers until September). Carpels: oval or elliptical-oblong to slightly larger lateral ribs, sometimes dilated, narrower than the body of wing-shaped mericarp. (The latter is considered by Lloyd, as the most important to observe.) Fruiting in September-October. Fallen seeds float for some time and can then be transported by tides and currents. The oblong fruits are 4-6 × 2-3mm. The seeds seem to germinate normally in November.

Hybridisation is possible with *Angelica sylvestris* (Wild Angelica) and *Angelica archangelica* (Garden Angelica) and their subspecies, which would be confirmed by genetic studies. *A. heterocarpa* is hydrophytic (*i.e.*, an oligohaline), and shares its 'preferred' habitat with *Schoenoplectus* and *Eleocharis*. It is found only on the shores of estuaries in the south-west of France, occupying the interphase between the seawater environment and the freshwater environment of rivers in their mature phase, and more precisely in the muddy patches in the floodable areas of the river flood plain above the mean high water mark but encroachable by the spring and neap tides. On the Loire, it is rather sciaphilous ('preferring' the shade of ash-alder woods, poplar or willow, or the edge of the woodland in general) (Guitton *et al.*, 2003). The relevance to the British-Irish botanist, apart from the fact that Lloyd was himself British, is that it is quite possible that hybrids of *A. archangelica* and either *A. sylvestris* or *A. heterocarpa* may make their way to these islands by seed sold by seed supply houses and the local botanist needs to be aware of the possibility that the *A. sylvestris* observed in wet meadows may not be what it appears. A further point of relevance is that the flora of Brittany exhibits a marked similarity to the British Isles' flora, and it represents the 'next step' to 'mainland' continental flora, and a closer study of the flora

of Brittany may have something to say about the emergence and evolution of the flora of the British Isles.

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The botanical illustrations of John Gould's *The birds of Great Britain*

JAMES CADBURY, *93 Barton Road, Cambridge, CB3 9LL*

This paper aims to examine the botanical elements of the plates in John Gould's *The birds of Great Britain.* This magnificent work was published in 25 parts as five volumes between 1862 and 1873. During his industrious life Gould produced 19 illustrated folio works. *The birds of Great Britain* was one of the latest. This contains 367 folio plates which, as well as illustrating the birds, attempt to depict their habitat. Gould had limitations as an artist. Final art work for the birds was largely left to Joseph Wolf, a young but skilled German zoological artist. Plants and fungi appear in all but 45 plates. It was Gould's accommodating young wife Elizabeth (née Coxon), a talented artist herself, who probably selected and drew most of the plants for the plates. She was a major but unsung collaborator in many of her husband's works. While Gould lived to the age of 76 she died at 37 shortly after giving birth to an eighth child.

Ninety-eight species of angiosperms, five conifers, three pteridophytes, three bryophytes, five lichens, five brown algae and two fungi can be specifically recognised in the plates. Most frequently depicted are Common Reed (*Phragmites australis*) (30 plates), Scots Pine (*Pinus sylvestris*) (20), Heather (*Calluna vulgaris*) (19) and Pedunculate Oak (*Quercus robur*) (14). Kelp (*Laminaria saccharina*) and Ivy (*Hedera helix*) each occur in seven plates, while Yellow Water-lily (*Nuphar lutea*) and Common Water-crowfoot (*Ranunculus aquatilis*) are represented in six. Those with no plants are mostly of larger non-passerines such as seaducks, birds of prey and gulls.

Some of the plants illustrated are scarce or have a restricted distribution in Britain and Ireland. They include Maiden Pink (*Dianthus deltoides*), Common Wintergreen (*Pyrola minor*) (2 plates) (see inside front cover), Grass-of-Parnassus (*Parnassia palustris*) (2), Sea Pea (*Lathyrus japonicus*) (2) Spring Gentian (*Gentiana verna*) (2), Oysterplant (*Mertensia maritima*), Early Spider-orchid (*Ophrys sphegodes*) and Fly Orchid (*O. insectifera*). Mountain Avens (*Dryas octopetala*) is only represented in leaf.

Eighteen species of plants that are not indigenous to Britain and Ireland appear in the plates. They include five conifers, including Maritime Pine (*Pinus pinaster*) and Arolla Pine (*P. cembra*), Tulip-tree (*Liriodendron tulipifera*), London Plane (*Platanus ×hispanica*), Turkey Oak (*Quercus cerris*), Date Palm (*Phoenix dactylifera*) and several alpine plants: Rock Jasmine *Androsace alpina*, Alpenrose (*Rhododendron ferrugineum*/

R. hirsutum), Mountain House-leek (*Sempervivum montanum*) and Alpine Butterwort (*Pinguicula alpina*) (extinct in Britain).

Some of the plants provide particularly attractive decoration to the plates. Examples are Traveller's Joy (*Clematis vitalba*), (4 plates) (see inside front cover), Round-leaved Sundew (*Drosera rotundifolia*), Wild Cherry (*Prunus avium*), Purple-loosestrife (*Lythrum salicaria*), Bittersweet (*Solanum dulcamara*), Crosswort (*Cruciata laevipes*), Chicory (*Cichorium intybus*) (2) and Bluebell (*Hyacinthoides non-scripta*).

Some of the plants seem inappropriate to the birds with which they are depicted:

Maritime Pine – Raven (normal habitat in Britain is rocky coast and upland).

Tulip-tree – Rose-coloured Starling (Asian steppes).

Common Water-crowfoot – breeding Grey Phalarope (arctic pools).

Cross-leaved Heath (*Erica tetralix*) – Red-legged Partridge (arable and dry grassland).

Bladder Campion (*Silene vulgaris*) – Corncrake (damp grassland). The species is virtually absent from the present Corncrake range in northwest Scotland

Common Wintergreen – White Wagtail (villages and farmland on the Continent); Yellowhammer (hedgerows).

Sea-holly (*Eryngium maritimum*) – Little Stint (wetlands)

Bittersweet – Woodchat Shrike (dry scrub, southern Europe)

Spring Gentian – Pallas' Sandgrouse (Asian deserts).

Oyster-plant – non-breeding Golden Plover (grasslands and arable).

Common Butterwort (*Pinguicula vulgaris*) – Black-crowned Night-heron (wooded lakes and rivers on the Continent).

Fly Orchid – Richard's Pipit (breeding in steppe grassland).

Early Spider-orchid – Northern Wheatear and Red-billed Chough.

Though the association appears inappropriate in more recent times, Early Spider-orchid may have grown on calcareous downs in southern England where Wheatears once bred.

The choice of plants illustrated is surprisingly limited. Many common and widespread species are not depicted, even though they may be important components or characteristic of bird habitats. Examples are Bracken (*Pteridium aquilinum*), Hazel (*Corylus avellana*), Elder (*Sambucus nigra*), Sycamore (*Acer pseudoplatanus*), Common Nettle (*Urtica dioica*), and there are no crucifers or thistles *Carduus* and *Cirsium* spp. Other than Gorse (*Ulex europaeus*) the only legume is a plant that has the floral arrangement of Common Bird's-foot Trefoil (*Lotus corniculatus*) but the leaf of Horseshoe Vetch (*Hippocrepis comosa*) which is inappropriate in a plate of Kentish Plover that breeds on coastal shingle.

Though the value of depicting plants as bird habitat may be limited and in some instances misleading, their inclusion greatly enhances the attractiveness of the plates. For this one must praise Elizabeth Gould's considerable contribution.

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An update on numbers of locations and population sizes of some CR (Critically Endangered) and EN (Endangered) vascular plant Red List taxa

PETER A. STROH, *14 Rushmere Close, Islip, Northamptonshire, NN14 3LG*; (peter.stroh@bsbi.org.uk)
KEVIN J. WALKER, *97 Dragon Parade, Harrogate, North Yorkshire, HG1 5DG*; (kevin.walker@bsbi.org.uk)
SIMON J. LEACH, *Natural England, Riverside Chambers, Castle Street, Taunton, Somerset, TA1 4AP*; (simon.j.leach@naturalengland.org.uk)

In September 2011, a request for information was published by Leach & Walker (*BSBI News*, 118: 14-19) with a view to updating estimates of site and population data for species that were assessed in the GB *Red List* (Cheffings & Farrell, 2005) as 'Critically Endangered' (CR) or 'Endangered' (EN), based wholly or partly on either the number of extant locations and/or population size. When the *Red List* was published, detailed evidence for some species categorised as being CR and EN was incomplete or based on old data, while the assessments for many species now require updating or amending following taxonomic changes, recent discoveries or reported increases and declines. The collation of detailed, up-to-date information for these CR and EN species is considered a high priority by the GB Species Status Assessment Group (SSAG), providing essential evidence on how our most threatened species are faring, which in turn will help to assess the efficacy of site protection and conservation management, and priorities for future ecological study. Updated information for CR and EN taxa will inform the Red List Amendments process (Year 8) and possible changes in threat status, and will also be incorporated into the full-scale review of all taxa for both an England Red List, due to be completed by the end of 2013, and the next GB Red List which is planned for 2020.

An excellent response by recorders and others has now enabled the completion and/or revision of location and population details for almost all of the 46 species currently considered to be either CR or EN wholly or partly because of their small population size and/or small number of extant localities (see Table p. 43-45). This is a great step forward, particularly for the 26 species for which there were previously significant gaps in either location or population data e.g. *Asparagus prostratus* (Wild Asparagus), *Campanula patula* (Spreading Bellflower), *Polygala amarella* (Dwarf Milkwort), *Rumex rupestris* (Shore Dock), *Scirpoides holoschoenus* (Round headed Club-rush). Revising this important dataset would not have been possible without the skills and commitment of vice-county recorders and other volunteers. The BSBI is extremely fortunate to have such people in its ranks, and we wish to express our thanks here for all the information that has been provided.

The recently compiled information suggests that the population size of some threatened taxa has increased since the data were gathered for the GB *Red List* e.g. *Clinopodium menthifolium* (Wood Calamint), *Crepis praemorsa* (Leafless Hawk's-beard), *Liparis loeselii* (Fen Orchid), whilst many others appear to have some level of stability e.g. *Carex depauperata* (Starved Wood-sedge), *Juniperus communis* subsp. *hemisphaerica* (Lizard Juniper), *Pulmonaria obscura* (Suffolk Lungwort), *Rumex rupestris* (Shore Dock). A stable or increasing population may be the result of a wide combination of factors, including climatic variation and disturbance events; but in many cases, like that of *Clinopodium menthifolium* or *Corrigiola litoralis* (Strapwort), it is clearly due to a combination of continued site protection measures and targeted conservation management, the latter sometimes including the augmentation of existing populations (see below). For two of our most threatened species, the recorded

increase in numbers can be at least partly attributed to either more comprehensive recording effort (in the case of *Crepis praemorsa*) or the discovery of new populations (for *Liparis loeselii*). Due to gaps in the earlier dataset, it is less easy to identify those species that appear to have fared badly in the past ten years, although the drop in *Phyteuma spicatum* (Spiked Rampion) numbers and the possible loss of *Damasonium alisma* (Starfruit) are a cause for concern, particularly as the latter species has been the subject of intensive re-introduction attempts. Additionally, surveys undertaken in 2013 for *Dactylorhiza incarnata* ssp. *ochroleuca* (an Early Marsh-orchid) have established that, while it appears to have gone from one of its three 'extant' locations, it seems to be doing well at its two remaining sites (both SSSIs being deliberately managed for this taxon), with numbers of plants clearly increasing in recent years.

Data compiled for this exercise were useful in helping to evaluate how introduction programmes involving any of these CR and EN taxa were progressing. Following IUCN guidance, introductions are only included in Table 1 if they are on sites lying within a plant's natural range, used suitable genetic stock, are more than five years old and can be shown to have resulted in the production of viable offspring, *i.e.* they appear to be 'self-sustaining'. Recent observations suggest considerable variation in the long-term success of such introductions. For example, it would seem that *Damasonium alisma* and *Atriplex pedunculata* (Stalked Sea-purslane) introduced populations are currently not faring at all well, although in the former case there is still a need to re-survey introduction sites in order to update population and location details, and in the latter case it is hoped that unfavourable weather conditions and flooding in 2012 will have caused only a temporary setback in population size. In contrast, introductions or augmentations of *Veronica triphyllos* (Fringed Speedwell) in the Brecks, *Corrigiola litoralis* at Slapton Ley and the huge increase in numbers of *Teucrium scordium* (Water Germander) at an introduction site in the Cambridgeshire Fens show how successful introductions can be, particularly if 'receptor sites' can be found that provide just the right conditions for the species involved. In the case of *T. scordium*, its needs would appear to be fourfold: 1) the presence of areas of bare ground and limited competition from surrounding vegetation in the spring; 2) the provision of mechanisms for dispersal and colonisation (grazing by livestock and geese, ephemeral flooding and drawdown); 3) continuity of management; 4) a large enough site to give the species room to move around between patches of suitable habitat.

We now have a much clearer picture of how our CR and EN taxa are faring, but continue to welcome updates that would help in assessing this suite of species in the lead-up to the next GB Red List. Work is just about to start on a similar exercise to compile up-to-date information for 75 species assessed as Vulnerable (VU) in the GB Red Data List due to their small population size and/or number of localities (≤5). For most of these taxa, we will simply require an update on the number of localities. However, it is possible that for a small number of species a decline in population size may indicate the need for a reassessment of their threatened status; in such cases, we will also need up-to-date population data. We intend to write a short article for the January *BSBI News* to outline in more detail the VU species for which we will be requiring information.

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Taxon name (names in GB Red List are given in parentheses where different)	GB Red List	Locations - GB Red List	Locations - revised 2011-13	Individuals - GB Red List	Individuals - revised 2011-13	Notes
Alchemilla micans	EN	4	7	<800	100s	Includes a new site found in 2013 and one translocation site
Alchemilla subcrenata	EN	<5	21	nd	>300	Individuals are probably in the high hundreds
Alisma gramineum	CR	nd	3	<250	c250	
Arabis alpina	EN	nd	2	83	113	
Arenaria norvegica ssp. *anglica*	EN	27	21	<10000	<800	Since 2000, individuals have ranged between 300 and 800
Asparagus prostratus (*officinalis* ssp. *prostratus*)	EN	nd	28	nd	1294	
Atriplex pedunculata	CR	1	1	nd	0	No plants were found at the introduction site in 2012, but a count is planned for 2013 and so the location figure remains at 1 for the present time
Campanula patula	EN	nd	15	330	294	
Carex depauperata	EN	nd	2	<100	c63	The introduction site at Charterhouse is not included as it is <5 years old
Centaurium scilloides	EN	2	3	nd	c600	
Cephalanthera rubra	CR	nd	2	c30	34	
Clinopodium menthifolium	CR	1	1	<250	c1500	
Corrigiola litoralis	CR	1	1	<50	c400	The individuals figure includes introductions that have bolstered the extant population
Cotoneaster cambricus (*integerrimus*)	CR	1	1	6	6	
Crepis praemorsa	EN	1	1	200	1775	For the latest count all but c5 plants were vegetative

Cyprepedium calceolus	CR	1	1	1	2	Figures do not include introductions as there is no evidence yet of these producing viable/self-sustaining populations
Dactylorhiza incarnata ssp. *cruenta*	EN	nd	2	nd	11	
Dactylorhiza incarnata ssp. *ochroleuca*	CR	nd	2	nd	<60	
Damasonium alisma	CR	1	0	2	0	Records suggest that there are no extant sites, and any 'new' records would relate to recent introductions
Epipactis sancta	EN	nd	1	nd	70	
Epipogium aphyllum	CR	nd	1	nd	1	
Euphrasia cambrica	EN	nd	3	nd	<200	
Euphrasia rotundifolia	EN	2	1	<250	1	Recent surveys have located just one individual
Gentianopsis (*Gentianella*) *ciliata*	CR	1	1	15	3	
Homogyne alpina	EN	1	1	200	<200	
Illecebrum verticillatum	EN	nd	11	nd	<500	Includes 5 sites where alien/native status is uncertain
Juniperus communis ssp. *hemisphaerica*	CR	nd	1	16	13	The reduction in individuals relates to Welsh plants no longer considered to be this taxon, and in fact an increase in English individuals from 11 to 13.
Liparis loeselii	EN	nd	5	<1000	c10000	
Luzula pallescens (*pallidula*)	CR	1	2	<50	<50	
Orobanche picridis (*artemisiae-campestris*)	EN	4?	4?	<100	c650	The number of locations refers to the 4 main areas where the species is found.
Phyteuma spicatum	EN	nd	8	400	197	
Polygala amarella	EN	nd	16?	nd	876	
Potentilla rupestris	EN	4	4	176	197	
Pulmonaria obscura	EN	3	3	600	<1000	

Rumex rupestris	EN	nd	>36	nd	>560	Records show substantial year-to-year natural fluctuations in numbers of individuals at some sites, especially those supporting particularly large populations (Penhale, Soar Mill Cove), but number of locations and population size since 2005 otherwise generally stable
Saxifraga cespitosa	EN	nd	7	nd	c100	
Schoenoplectus triqueter	CR	1	1	1	4	The 1998 transplant now comprises 4 clumps with 20% of stems flowering. There have been a further 4 recent (2010) introductions, with more planned
Scirpoides holoschoenus	EN	2	2	nd	>1000	
Scleranthus perennis ssp. *perennis*	CR	1	1	32	75	
Senecio paludosus	CR	nd	2	<50	c40	The location figure includes one self-sustaining introduction at Woodwalton Fen
Sorbus domestica	CR	5	5	<30	<30	
Teucrium scordium	EN	2	4	nd	>100000	For the time being, location and population figures include two introduction sites (Kingfishers Bridge, Bassenhally Fen)
Veronica triphyllos	EN	nd	5	<250	c2500	For the time being, includes 4 introduction sites. If only the sole native site was used, the population figure would change to <50 plants.
Veronica verna	EN	nd	10	nd	>2200	The population figure excludes RAF Lakenheath (no data) which potentially holds the largest population of any GB site
Viola canina ssp. *montana*	EN	nd	2	<250	<250	
Woodsia ilvensis	EN	nd	5	c100	89	Location and population counts exclude introductions as they are not considered self-sustaining

Why are some hermaphrodite plants more 'female' or 'male' than others? Proposed research using *Sagittaria sagittifolia*

CRISPIN Y. JORDAN, *108 Polwarth Gardens, Edinburgh, Midlothian, EH11 1LH*; (crispin.jordan@ed.ac.uk)

The sex lives of plants have fascinated biologists for over a century. Following his publication of the *Origin of species*, Charles Darwin published ten additional major works, six of which focused on plants, of which three examined plant reproduction in detail. The diversity of plant reproduction astonishes. Most plant species are strictly hermaphrodite, with both male and female sex functions potentially served by each individual plant (Barrett, 2002). However, evolution has produced species with separately sexed individuals (like humans), as well as many variants (Charlesworth, 2006), such as species that comprise separate hermaphrodite and male individuals, separate hermaphrodite and female individuals, as well as hermaphrodite plants that produce both flowers with only female (ovule/egg production) or male (pollen production) function. Of course, hermaphrodites also exhibit great diversity in their rates of self-fertilisation, ranging from almost completely outcrossing to almost completely selfing (Goodwillie *et al*., 2005).

A somewhat neglected feature of reproduction in hermaphrodite species is the fact that, although on average individual plants in a population contribute equally to seed production via female and male function, individual plants vary greatly in how much they contribute to seed production via these two routes. For example, numerous studies that use genetic markers have shown that some plants contribute to seed production very effectively through egg production and pollen receipt (female function) but very little through delivering pollen to fertilise ovules (male function), despite the fact that they produced pollen (*e.g.*, Ennos, 1987; Devlin & Ellstrand, 1990; Elle & Meagher, 2000). Such plants are considered 'functionally' more female than male (Lloyd, 1980). Of course, other plants in the same population contribute to reproduction most through the opposite means (being functionally more male then female), contributing more pollen to seed production than contributing ovules, despite having produced ovules, whereas other individuals contribute relatively equally through female and male function. Although numerous studies have found variation in functional gender, few have investigated its causes.

Variation in functional gender could arise by a few means. First, random variation in the environment could cause plants to be more functionally female than male. For instance, some areas of a population might elicit fewer visits by pollinators, which might decrease the dispersal of pollen to other plants (thereby limiting male function) more than it diminishes pollen receipt (female function). Alternatively, genetic differences among plants in a population might influence a plant's propensity to contribute ovules versus pollen to seed production. It is well known that mutations can cause a plant to lose a sex function entirely (*e.g.*, a mutation that causes male sterility; Charlesworth, 2006). However, little is known about mutations that affect a plant's functional gender, without complete loss of a sex function.

I am a post-doctoral researcher, specialising in the evolution of plant reproduction, at the University of Edinburgh. In an upcoming grant application, I hope to study the genetics of functional gender using the species *Sagittaria sagittifolia* (Arrowhead). More specifically, I aim to investigate whether functional gender varies because individuals carry different genes that cause 'trade-offs' between female and male function; *i.e.*, a gene might improve male function but decrease female function, or *vice versa*. This UK species has a number of ideal qualities for this purpose. Foremost, it produces separate female and male flowers on the same plant (*i.e.*, it is monoecious: at the plant level, individuals are hermaphrodite, even though individual flowers are not). This allows one to easily quantify female and male features, and understand why certain genes cause individual plants to function more as females/males. It also is easy to grow, produces flowers easily, is amenable to experimental manipulations, and

can reproduce both clonally as well as sexually (by seed), which is very handy for experiments. Spencer Barrett at the University of Toronto has done fantastic work with another species of *Sagittaria*, showing how good it is to work with members of this genus (http://labs.eeb.utoronto.ca/barrett/Research.html).

Why is this work important? At the most basic level, this work tests for trade-offs between sex functions. Plants have been used greatly to test for trade-offs in other characters. For instance, due to limited resources, we expect that plants will produce either relatively few large seeds, or relatively many small seeds, because limited resources preclude the possibility of producing both many and large seeds. Such work has helped us understand the tremendous variation in seed size found among plant species. Similarly, work has addressed trade-offs between the size and number of flowers produced. However, no work has sought to test for trade-offs between sex functions, as I propose to do. Consequently, this work could change how we view plants, by testing whether their genes make individuals more prone to femaleness/maleness. This impacts several scientific questions, including the question of what forces maintain genetic variation within populations. This work also connects nicely with previous work on *Sagittaria* (*e.g.*, Spencer Barrett's work), and may help to explain why and how dioecy (species that have separate male and female individuals) evolves, which is rare among flowering plants. On a personal level, I find understanding functional gender motivating as it adds more 'personality' to the typical view of the life of plants (and represents a good 'public relations' event for plants!). Perhaps more tenuous, but still important, this work could have implications for agriculture: if further studies show that many plants species have genetic variation for femaleness/ maleness, this presents a case to ensure that crops are produced from genetically diverse seeds, to ensure that both 'functional sexes' are represented, which could improve crop yields. This proposed work represents a useful first step.

The work will take a number of years. This year, I am looking to obtain seed from as many UK populations as possible in order to maximize the genetic diversity available for experiments, with seed from multiple individuals per population. My immediate goal is to obtain seeds to conduct preliminary work that will strengthen grant applications I will make next year. On receipt of a grant, the first round of experiments will take two to three years.

If anyone comes across a UK population of *Sagittaria sagittifolia* with mature seeds, I would greatly appreciate it if you sent me mature fruits from several individuals, spaced a couple of metres apart (they can reproduce clonally, so the spacing helps ensure that genetically separate individuals are sampled). I can be found at: Institute of Evolutionary Biology, The University of Edinburgh, Kings Buildings, Ashworth Laboratories, West Mains Road, Edinburgh, EH9 3JT, UK, email: crispin.jordan@ed.ac.uk. I look forward to interacting with the BSBI throughout this work.

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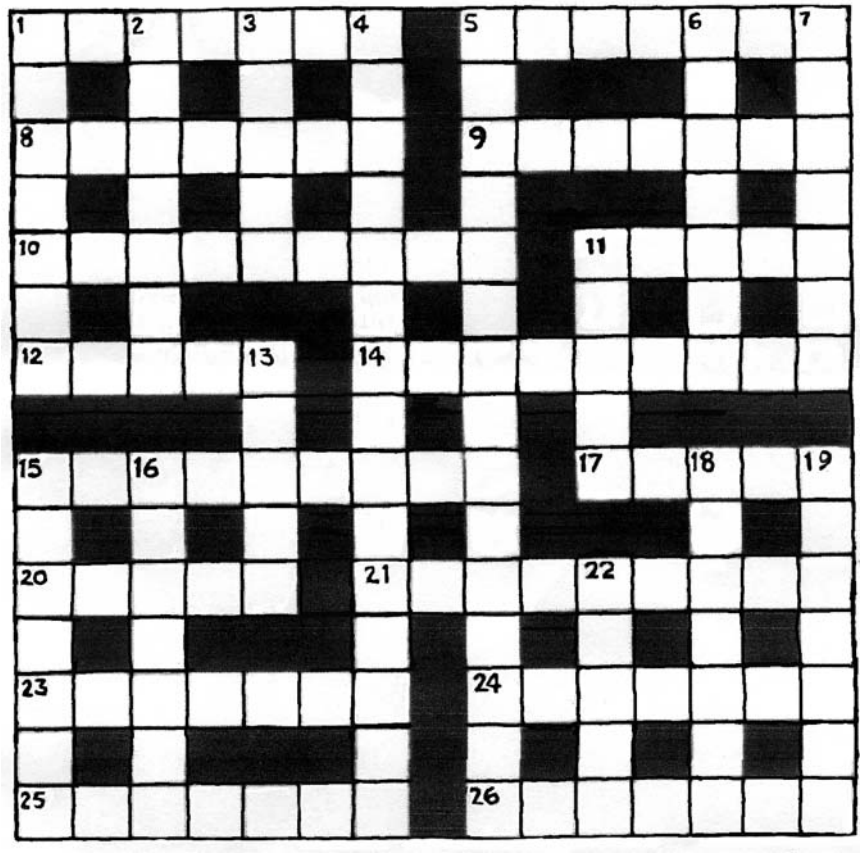
Botanical Crossword 20

By CRUCIADA



ACROSS

1. Horse is crazy about hazel fruits (7)
5. It's a sticky situation if you're up one! (3, 4)
8. Fern found in forests by one American (7)
9. Only on Snowdon do a lily magically appear (7)
10. Fruit's colour is due to base-rich rock (9)
11. Trail signs helpful to animal trackers (alas, poor plant-hunters miss out) (5)
12. Wild pear made into syrup (5)
14. Best wards arranged for sticky Willie's family (9)
15. Some latch onto revolution of townhall clock (9)
17. Do wise people cultivate these aromatic plants? (5)
20. Abandon game, for example, in area of stunted vegetation (5)
21. To do with crusty growths said to be similar to a facial feature (9)
23. Finish affected by type of xylem development (7)
24. Grain co. changes to using only natural fertilizers etc. (7)
25. Sun has a dead feeling, almost, from deadly nightshade, for example (7)
26. Stays if possible to fulfil expectations (7)

DOWN

1. Primula gives cries of pain during cutting operation (7)
2. Embarrassing mistake made about flower (7)
3. Get new suits in islands of the Outer Hebrides (5)
4. Lily that features in Christmas story (4, 2, 9)
5. Apple given as severance handshake to Reginald D. Hunter addressed by his middle name? (6, 9)
6. Note on wireless about allseed (7)
7. Australian shrub found when Sir returned to Cape (7)
11. Parks around eastern places where particular plants can be found (5)
13. Unfortunately, I bash Indian boss (5)
15. Gets the hang of metamorphosis first with daisy-like flowers (7)
16. Saint seen to be ill-mannered when left apple pastry (7)
18. Reasons for extensive gardens (7)
19. Rough and incomplete drawing unknown (7)
22. Crop fungus found in former Gothic location (5)

ALIENS

Soliva sessilis/*valdiviana* in Surrey (v.c.17)

GEORGE HOUNSOME, *14 St. John's Rise, Woking, Surrey, GU21 7PW*;
(george.hounsome@btinternet.com)

You can get a quick response with e-mail! I had one from Dr D. J. Nicholas Hind, Head of Compositae Research at RBG Kew, before my copy of *BSBI News*, **122** had even landed on the doormat, pointing out that the plant I described on page 37 was *Soliva valdiviana* Phil., not *S. sessilis* Ruiz & Pav. as I had thought. After my blushes had faded, I began to wonder about the discrepancy, so I contacted Dr Hind and he kindly sent me a copy of a paper by the Argentinian botanist Angel Cabrera (1949), with a translation of the key and species descriptions. Following it up, with a lot of information from Dr Hind and some from the internet, I found that *Soliva* taxonomy is a can of worms. Cabrera reviewed the genus in South America, describing nine species in two subgenera with a key based mainly on achene morphology. Subsequently, Lovell, Maxwell & Jacob (1986) and Webb (1986) in New Zealand; and Ray (1987) in California examined introduced populations of *Soliva*, all of them concluding that Cabrera's species should be included in a very variable *S. sessilis*. Bremer & Humphries (1993) reviewed the genera in the Anthemideae, a tribe of the Asteraceae (= Compositae), and accepted the nine species of Cabrera without critical re-examination of species boundaries. To compound the uncertainty, *The plant list*, an electronic list produced in collaboration between RBG Kew and Missouri Botanical Garden of all known vascular plants and bryophytes, lists eight *Soliva* spp. including *S. sessilis* and *S. valdiviana* (but not *S. pterosperma* (Juss.) Less.), whereas *Tropicos*, a similar list produced by Missouri Botanical Garden alone, gives only *S. sessilis*, with the others included in the list of synonyms.

The determination of the Ripley plants as *S. sessilis* by Eric Clement was transatlantic, following the findings of Ray. However, opinion on species boundaries is divided and, until the picture is clearer, the most useful approach is to follow that of Cabrera. If that is upheld, no information has been lost, but if it isn't we can mentally adjust all the synonyms to *S. sessilis*, or whatever name is applicable, as we have had to do with so many other plant names. It would be interesting to know what their DNA has to say about it. Baldwin *et al*. (2012) cite the chromosome number in the genus as varying between 2n=110-120. Plants are usually, but not always, self-pollinated (Webb, 1986) and breed true. Each population so far found in the British Isles has an achene structure constant within each but different from the other, suggesting an origin from a single seed in each case, perhaps as a grass seed contaminant.

In the light of all this, the Ripley plants are re-assigned to *Soliva valdiviana*. I believe this is the first British, and possibly Northern Hemisphere, record for the species, and I have to retract my claim in *BSBI News* **122** to have found a second colony of *S. pterosperma* to follow Felicity Woodhead's plants at Bournemouth. I have reproduced the drawings of achenes from Cabrera's paper, with permission, as well as his key, ready to generate discussion for the next population to be discovered.

Key to species of *Soliva* (from Cabrera, 1949 – translated by Hind)

A. Achenes obovate, wings flat or wingless, without long hairs apically — Subgen. *Soliva*
  B. Achenes wingless — 1. *S. valdiviana*
  B. Achenes winged, wings terminating in a large point
    C. Achenes glabrous, wings entire — 2. *S. neglecta*
    C. Achenes pubescent
      D. Wings entire — 3. *S. sessilis*
      D. Wings with a marked basal lobe — 4. *S. pterosperma*

A. Achenes oblong or cuneiform, with thickened wings, usually undulate, long-hairy in upper part or glabrous — Subgen. *Gymnostyles*
  E. Wings ending in divergent thorns, achenes lacking long hairs in upper part — 5. *S. stolonifera*
  E. Wings rounded or truncate, achenes with long, crisped caducous hairs
    F. Plants very densely pubescent — 6. *S. mutisii*
    F. Plants laxly hairy or glabrescent
      G. Leaves tripinnatisect, second order segments numerous, short, dentate or partite; achenes cuneiform, wings undulate, notched below 7. — 7. *S. anthemifolia*
      G. Leaves bipinnatipartite, second order segments few, long, entire or rarely bifurcate; achenes oblong, wings flat or slightly undulate, entire
        H. Achenes apically truncate; wings undulate — 8. *S. macrocephala*
        H. Achenes apically rounded, wings flat or almost flat — 9. *S. triniifolia*

Acknowledgements:
I would like to thank Nicholas Hind for raising the issue, providing an abundance of information and references concerning the genus, for translating the key and for reviewing this note, and Eric Clement for his many helpful comments on the subject. I would also like to thank Dra Paula Posadas and Dr Alfredo Carlini of Universidad Naçional de La Plata for permission to reproduce Cabrera's drawings.

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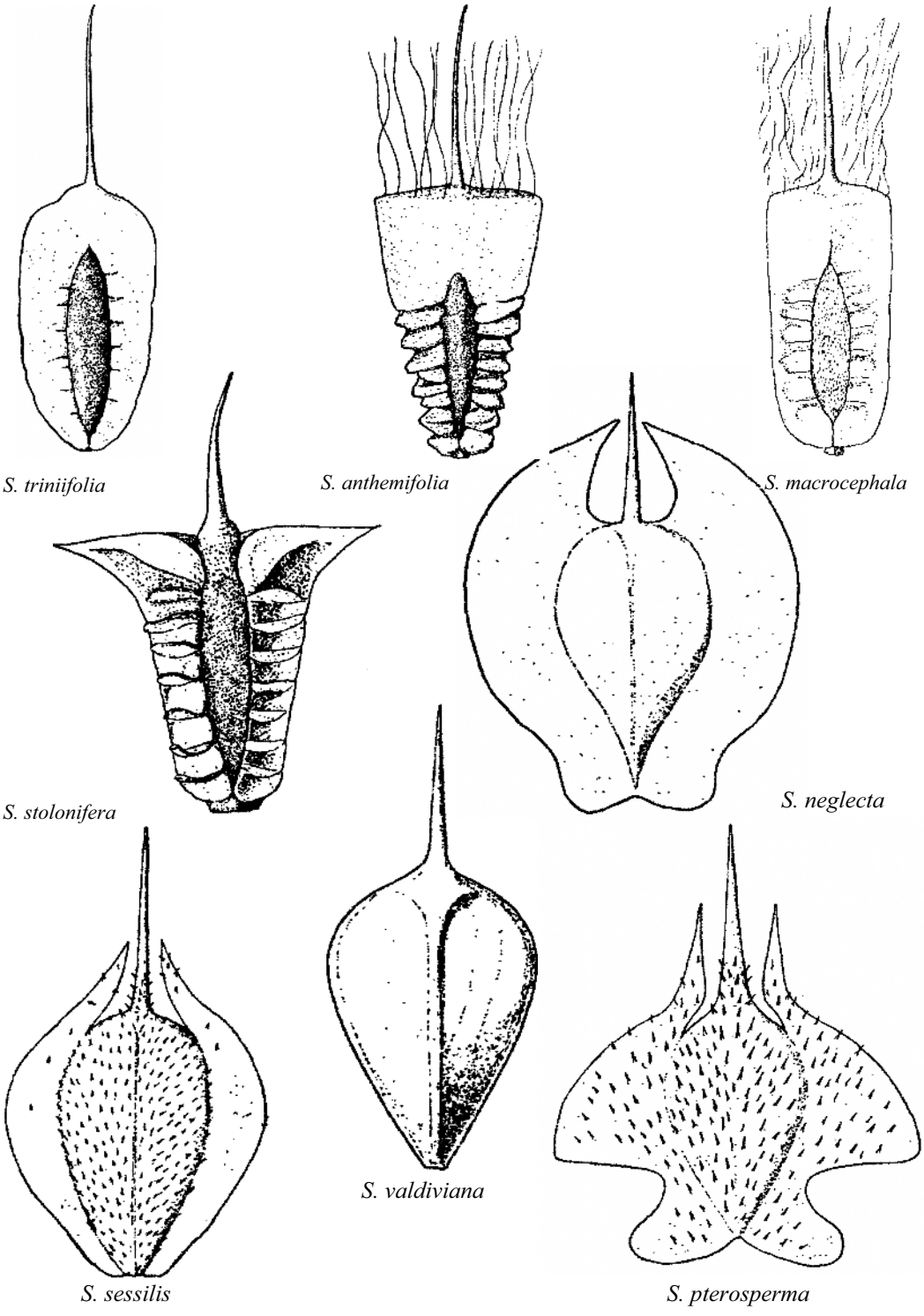

Fig. 1: Achenes of *Soliva* spp. Drawings reproduced from Cabrera (1949)

Bromeliads: first toeholds in the British Isles

JACK OLIVER, *High View, Lockeridge, Marlborough, Wiltshire, SN8 4ED*;
(jackeoliver@btconnect.com)

Most bromeliads are epiphytic, mainly deriving from American tropical rainforests, but two terrestrial species grow and persist wild in the Isles of Scilly. Extensive natural spread of one of these is questionable, but the other seems to be slowly increasing.

The two mainly terrestrial genera, *Ochagavia* and *Fascicularia* are the two found in Scilly. Both are in the Bromelioideae, section 3 of the Bromeliaceae, from Chile and the adjacent Pacific Juan Fernandez Islands (Mabberley, 1997).

Ochagavia carnea (Tresco Rhodostachys) is a pineapple-like plant, which is given as rare, but naturalised on Tresco dunes (Mabberley, 1997; Parslow, 2009). *Ochagavia lindleyana* is illustrated in *Wild flowers of the world* (Everard & Morley, 1970), but that species has leaves with forwardly-directed marginal spines, whereas *O. carnea* has patent to recurved marginal spines (illustrated in Brickell, 1998). I have seen a Rock Pipit trapped and dead within an *O. carnea* rosette on Tresco.

Concentrations of naturalised exotics in Tresco are exemplified in this extract from *The Isles of Scilly* (Parslow, 2009): "Some of the exotic plants (originally) planted out on the dunes at Appletree Banks have now become completely established. The commonest non-native to become naturalised was probably the *Agapanthus* (African Lily), but another that appears to be spreading is the extraordinary spikey, agave-like Rhodostachys (*Fascicularia bicolor*) and the very similar Tresco Rhodostachys (*Ochagavia carnea*). Other exotic plants that have become established (at this site) include Red-hot Pokers (*Kniphophia*), the tall white Bugle Lily (*Watsonia borbonica*) and Montbretia (*Crocosmia* ×*crocosmiiflora*) … away from the shore, Hottentot Fig (*Carpobrotus edulis*), Sally-my-handsome (*C. acinaciformis*) and the New Zealand Wireplant (*Muehlenbeckia complexa*)". Therefore, in one small area, there are represented naturalised exotic representatives of the Aizoaceae, Bromeliaceae, Iridaceae, Polygonaceae and Xanthorrhoeaceae.

O. carnea is rather frost-sensitive, and is rare outside Tresco. By contrast, *Fascicularia bicolor* (previously *F. pitcairnifolia*) occurs throughout Scilly, in Guernsey and west Cornwall as an "introduced survivor" (Stace, 2010). I think that *F. bicolor* is doing somewhat better than this, at least in parts of Scilly, for example at Pelistry Bay. It also has seemed slowly to have spread over five decades on maritime dunes, shingle and rocks; and on rocky field edges and stony walls inland.

F. bicolor can be seen as rather unappealing and intractable, having closely and tightly massed rosettes of dull green, long, thin, leathery leaves, with marginal, apically-(forwardly-) directed spines. The bases of these clumped bundles of rosettes are very tough, and can form a continuous ground cover ("even llamas won't eat *Fascicularia*"). However, older leaves can develop a silvery sheen, and some plants develop beautiful inflorescences. The photo (see Colour Section, Plate 4) shows a September flowering rosette on rocks, amongst the succulent leaves of Hottentot-fig (*Carpobrotus edulis*). Inflorescence leaves become crimson, packed corolla tubes pale blue, and, for a few days, conspicuous rings of primrose-yellow pollen patterns form in the corolla tubes on some plants.

Methods of spread and survival

Fascicularia had originally been planted as a low dune stabiliser, and for consolidation around the shores. It seems also to occur on some field boundaries and walls. I have seen clumps and rosettes moved inadvertently by agricultural machinery and by small bulldozers in construction and reconstruction work. The very tough whitish bases of the rosettes probably need to be detached for reliable re-rooting.

Fascicularia seems to be long-lived and also salt-resistant. I took a clump of rosettes which had become detached from a low cliff and had lain for months in the sea splash-zone. Re-rooting readily occurred. Tides may occasionally detach and move coastal clumps to new sites.

I am told that fertile seeds are locally produced (and sold), but have not yet identified any natural seedlings. On three occasions I have watched Herring Gulls tweak up, carry over distances, and then drop largish, part-green *Fascicularia* fragments, thereby possibly spreading viable bits of this plant species. It would seem that naturalisation of this Bromeliad is slowly proceeding in the Scillies.

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Campanula garganica (Adriatic Bellflower) on Plymouth Hoe

PHIL PULLEN, *95 Yealmpstone Drive, Plymouth, PL7 1HE*; (phil_pullen@hotmail.com)

Plymouth Hoe is formed of limestone rocks and, being south-facing and sheltered, it is not surprisingly home to some interesting plants, such as the well-known *Carduus pycnocephalus* (Plymouth Thistle). Recently, I became aware that a most attractive *Campanula* species had established itself on the rocks quite close to the sea, in an area which can probably be regarded as virtually frost-free.

Kicking myself for having overlooked this plant for several years, I took a number of photos (see Colour Section, Plate 4), which I sent off to Dr Forbes, BSBI referee for Non-British Alpine Plants. He got back to me with his opinion that the plants were *Campanula garganica* (Adriatic Bellflower). Dr. Forbes said: "I am pretty certain that this is *Campanula garganica*, a widely grown, rather variable, free-flowering, endemic species from S.E. Italy and Cephalonia in W. Greece. There are a number of garden varieties grown by Alpine gardeners, although it can be a bit invasive, as it seeds itself about readily. Flower colour varies from a clear blue to pure white. It was recorded in a pavement crack in Liverpool in 1987 (*BSBI News*, **48**: 35)."

Searching around for more information on this *Campanula,* I found a record in *Watsonia*, 28: 94 (2010):

> "‡*Campanula garganica* Ten. 129/1.gar. *62, N. E. Yorks.: several plants self-sown on wall, 37 Crescent Avenue, Whitby, NZ895111, V. Jones & A. Ritson, 2008, det. V. Jones, conf. E. J.Clement, herb. V. Jones. Ø E. J. Clement says probably second British record."

There is also a record of this plant growing on the walls of Norris Castle Farm on the Isle of Wight. This observation was made by David Trevan in 2011 and details can be found on the iSpot website at http://www.ispot.org.uk/node/177888

Campanula garganica might well be growing un-recorded in other places. Perhaps the Torbay limestone might be a likely spot to look for it.

Recording invasive species – the next step

JONTY DENTON, *31 Thorn Lane, Four Marks, Hants., GU34 5BX*; (JontyDenton@aol.com)

Am I alone in feeling somewhat worried by the propensity of papers on new discoveries of potentially invasive plants not ending with what, as someone who has been battling the likes of *Crassula helmsii* (New Zealand Pigmyweed) for over 20 years, would be a most welcome coda of either: a) "We then dug it up and pressed it", or b) "We arranged for someone to spray the thing with herbicide"?

The latest find reported in the last *BSBI News* (Hounsome, 2013) points out that "in other parts of the world…[*Spartina patens*]… has become a too-invasive pest". Well, it had to start somewhere, and what better way to avoid tempting fate than by nipping it in the bud, so to speak.

Reference:

HOUNSOME, G. (2013) '*Spartina patens* in West Sussex, v.c.13'. *BSBI News*, **123**: 66.

Pentaglottis sempervirens

MARY SMITH, *33 Gaynes Park Road, Upminster, Essex, RM14 2HJ*; (mary@smith33gpr.fsnet.co.uk)

You asked for others to write their experiences of this plant. I do a lot of local botanising in TQ58, northern parts of TQ57, and southern parts of TQ59. In this area we work in monads, and South Essex v.c.18 is one famous for its aliens of many kinds, since it has ports and the Thames coast, as well as lots of trucks/lorries from the Continent on major roads. Our soils include chalk and sands and gravels in the southern parts and mainly London Clay in the parts further north. Our climate is extremely dry (about 55cm rain per year, on average) so the well-drained soils are very early, but the clay is a later soil, each type with the expected variations in the plants.

My experience is that *P. sempervirens* grows almost anywhere and everywhere. I, with my colleague Bob, sometimes working together and more often separately, have between us covered nearly 130 monads, with others in progress, in the last 12 years. My MapMate tells me I have 121 records of this plant in my computer, so it is in just about every square, regardless of urban, industrial, arable farming, or any other land use, though we very rarely find it in ancient woodland or on the Thames shore, or in old grassland with a thick established sward as in two or three country parks. I can't say that clay versus lighter soils makes any difference here. But highly disturbed areas such as urban alleyways of various kinds, roadside verges, outside gardens on the pavement, any weedy corners etc are definitely the most usual habitats.

I have no idea as to how it propagates, but it clearly does fairly effectively. By seeds probably, but I have not noticed any.

However, I would not describe it as invasive and thus a general problem. We have plenty of invasives, such as *Smyrnium olusatrum* (Alexanders), *Fallopia japonica* (Japanese Knotweed), *Senecio inaequidens* (Narrow leaved Ragwort), and *Rubus armeniacus* (Himalayan Giant), as well as a number of water-nasties, all of which are seriously invasive. But, although we often find several small sites in one monad, it is very common, rather than invasive, in the wild. It never makes large patches here, except occasionally in neglected gardens. Not many animals seem to eat it: rabbits leave it alone, but Muntjac Deer seem to eat it but they eat everything! (see *BSBI News*, **123**!). I do not know what controls it in the wild environment, but something clearly does. In my suburban garden it is quite tricky to get rid of it because of its deep roots. But picking off any green of it whenever seen gives fairly good control. So I think it is more of an invasive nature in a garden, rather than in the great outdoors.

Fallopia ×conollyana seedling alert

JOHN BAILEY, *Biology Department, University of Leicester, LE1 7RH*; (jpb@leicester.ac.uk)

Walking up the road near the large live collection of plants of both sexes of Japanese Knotweed *s.l.* at the University of Leicester in early August, I was surprised to see a knotweed seedling, growing as bold as brass from a crack in the gutter (Colour Section, Plate 1). Although viable hybrid seed is often found on Japanese Knotweed plants, generally a result of pollination by Russian Vine *Fallopia baldschuanica*, *in situ* germination is extremely rare. A similar spate of seed germination was noted at the same location some 20 or more years ago after a particularly cold winter. I suspect that this is no coincidence and that an important factor here is that any seed produced tends to rot during our average warmer wetter winters. I subsequently looked at the live collections at the Botanic Gardens, where I found more than 18 first-year seedlings in a weedy area close to the main live collections (Colour Section, Plate 1). It should be noted that the collections at Leicester consist of Bohemian Knotweed (*F. ×bohemica*) and Giant Knotweed (*F. sachalinensis*) of both sexes, so these particular seedlings would be various classes of back-cross. The more usual situation is that Japanese Knotweed (*F. Japonica*), a male-sterile clone, is isolated from any related taxa apart from *F. baldschuanica*, and so any seed produced is *F. ×conollyana* (Conolly's Knotweed).

The purpose of this hasty note is to alert botanists around the country that this year may offer a good opportunity to find this rare hybrid, so I am providing pictures of seedlings to help with identification. The colour photos all illustrate back-crosses rather than *F. ×conollyana*, so there is a line drawing of that taxon (Fig. 3). Principle differences will be narrower leaves and a slight tendency to twine.

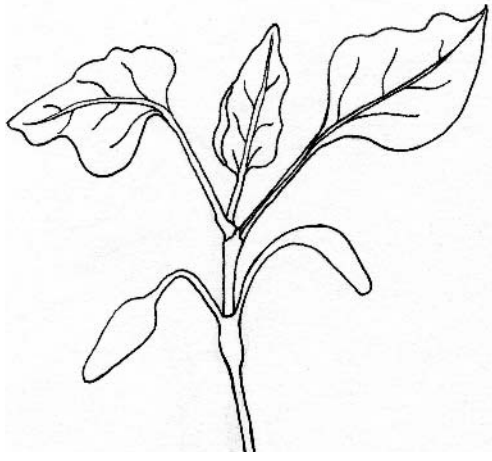

Fig. 3. Drawing of seedling of *F. ×conollyana*

Re-growth from herbicide treated plants can easily be confused for seedlings, so it is necessary to check for the presence of cotyledons (Fig. 3), or to excavate the plant to check that the whole root system emanates from the plant. If it is re-growth from a rhizome, the main stem will continue downwards for many centimetres.

Needless to say I would be most interested to hear of any finds!

OFFERS

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STEVE PREDDY, (Steve.Preddy@me.com)

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Unwanted herbarium specimens

ERIC J. CLEMENT, *54 Anglesey Road, Gosport, Hants., PO12 2EQ*

I have a small number of unwanted A4-sized herbarium sheets to dispose of: mostly Poaceae, but also a general collection of indets., from north-west Argentina. If interested, please supply an address and land-line phone number (no emails here!), and state your main interests.

REQUESTS

Viola palustris (Marsh Violet) specimens wanted

MIKE WILCOX, *43 Roundwood Glen, Greengates, Bradford, BD10 0HW*;
(michaelpw22@hotmail.com)

Viola palustris (Marsh Violet) material is wanted: with leaves and preferably with fruit, particularly any plants with hairy petioles. Please send in a plastic bag. Good grid reference and other habitat and locality details are also needed only for those with hairy petioles. It maybe a bit late in the season, but hopefully I can repeat this next year - any specimens welcome.

NOTICES

Online plant identification course

BRENDA HAROLD, *'Farthings', The Green, Sarratt, Rickmansworth, Herts., WD3 6BP*;
(brendaharold@btinternet.com)
Enquiries about tutoring in 2014 please email to: tutor@identiplant.co.uk

This course (described in *BSBI News*, **120**: 64) commenced in February with about 65 students and 25 tutors widely scattered from Devon and Kent to the Isle of Skye and Sutherland. It was a completely new venture and the first year has been a learning curve for all involved. One problem that we did not anticipate was the very cold spring, which left students unable to start because there were no flowers. Some dropped out but others have continued enthusiastically, enjoying the challenge of looking at plants more closely than ever before. A big 'thank you' is due to all the tutors who have supported them, sometimes having to master some very unfamiliar computer technology.

During the period September to December 2013 the first year's experience will be reviewed, some changes made, and tutors enlisted for 2014. Student enrolment for next year will begin in January 2014. All enrolled students are entitled to continue for a second year so it is hoped that current tutors will support continuing 2013 students even if they do not want to take any new ones. New tutors will also be welcome from anywhere in Britain or Ireland.

Tutors need to be experienced field botanists in their own geographical area. They should be able to handle a BSBI recording card comfortably, or to conduct a full NVC survey. They will receive all the same course material as the students plus additional guidance notes, and the plant species that the students have to find are all common ones, but tutors must be able to spot errors, to indicate the best diagnostic features and to give guidance on where to look. Broadband is essential, as course units and answer sheets are transmitted online. Tutors also need to read their emails regularly to respond to students' questions and to know when an answer sheet has been submitted. The time commitment need not be very great and gaps of

a week or two are perfectly acceptable although, obviously, tutoring continues throughout the flowering season. Finally, and most importantly, tutors must be sympathetic to beginners and able to communicate online in a helpful and encouraging manner. I suspect that many BSBI members would be surprised by the general lack of basic botanical knowledge, even amongst those with degrees in environmental subjects.

Further information can be found on the course website: www.identiplant.co.uk. Enquiries from prospective tutors will be very welcome, to the email address above.

Forming a Botany Group in South Yorkshire

Mel Linney, *18 Yvonne Grove, Wombwell, Barnsley, S. Yorkshire, S73 8NA*;
(Tel.: 07514 922441; melinney@msn.com)

I would like to hear from anyone who may be interested in forming a Botany Group in South Yorkshire. After reading the article from Leicester (v.c.55) about forming their group, I am sure the same can happen here in South Yorkshire. The new group would welcome anyone from beginner to expert. To help start things off, I have organised two meetings for 2014 that will be in the meetings calendar.

EVENT REPORT

BSBI success at Birdfair 2013

LOUISE MARSH, *BSBI Publicity & Outreach Officer*; (publicity@bsbi.org.uk)

BSBI had an exhibition stand at Birdfair 2013, held at Grafham Water in Cambs., which proved extremely popular with visitors and RSPB judges alike. We spoke to hundreds of people about the society's work and the BSBI stand was awarded the Best Stand Award (Conservation).

The photograph on the back cover shows Rachel Benskin, one of the BSBI Birdfair Team, receiving the Award from Martyn Davies (RSPB).

BSBI President, Ian Denholm, also offered a lecture to a packed and appreciative audience in the Anglian Water Birdwatching Centre. Entitled 'Botany for Birders', the lecture is available now as a pdf on the BSBI website www.bsbi.org.uk.

PROFILES OF NEW HONORARY MEMBERS

Arthur Copping: an eulogy

LOUISE MARSH, *The Herbarium, University of Leicester, Leicester LE1 7RH*;
(louise-marsh@talktalk.net)

I first met Arthur Copping in Charnwood Forest, during a field meeting to Charnwood Lodge NNR following the BSBI AGM in 2010, held at the University of Leicester. While demonstrating field characters of the various grasses and sedges present, Arthur held younger BSBI members local to the area enthralled with stories of botanising in Charnwood more than 50 years previously.

In 1956, while reading for a BSc in Special Mathematics at University College, Leicester, Arthur had accompanied a friend studying botany on a vacation task of collecting and naming 25 grass species. Armed with Hubbard's *Grasses*, then recently published, they tried and failed to name a single one, but fortunately on his return home to Norfolk, another botany undergraduate persuaded him

to try again, and helped Arthur start to make progress in the study of grasses.

In 1958, Arthur returned to Leicester for a post-graduate certificate of education and spent the following summer on daily visits to Charnwood Forest, collecting and naming sedges. Professor Tom Tutin at the University of Leicester checked Arthur's determinations and proposed him for BSBI membership. Only lack of means prevented Arthur from joining the society until 1968, but the lure of BSBI field meetings, especially if overseas, proved irresistible. Once a member, Arthur enjoyed field meetings in Yugoslavia, Lapland and Poland, and eventually organised and led a BSBI Field Meeting in Poland in 1989. Closer to home, he assisted on the Easterness survey in the early 1970s, which resulted in an invitation from the then Committee for the Study of the Scottish Flora to lead a field meeting in Lewis and Harris in 1975. Arthur notes: "Those were the days of Bob Mackechnie, a remarkable botanist to whom I owe a great deal."

Many of those who have attended Arthur's grass identification classes would acknowledge his remarkable teaching skills, honed by a career teaching mathematics. His annual identification classes are extremely popular, soon fill up and have helped many botanists see characters clearly in the field for the first time. BSBI members from v.c.55 and v.c.56 who met Arthur at the 2010 AGM will never forget the all-day grass identification session in Suffolk he kindly offered to lead for us and for a visiting Polish student at the University of Leicester. The meeting was a great success, and after twelve hours in the field, we (mostly in our 30s and 40s) were enthralled, informed and inspired, but totally exhausted, while Arthur was as perky as ever and rallied us round for a final treat, showing us *Lathyrus aphaca* (Yellow Vetchling) on a road verge by car headlight.

Arthur accepted Mary Clare Sheehan's invitation a few years ago to become referee for *Festuca*, taking over from Clive Stace. He remains a very active member of BSBI, attending many of the society's conferences, exhibitions and general meetings as well as field meetings through the years. This year's grass identification weekend ran in June 2013 and Arthur was participating in Glynhir Recording Week soon after.

When the Hon. Gen. Sec. proposed Arthur for honorary membership, I was delighted to be among those seconding the motion and to hear of Arthur's "astonished gratitude" on hearing of the proposal. To his modest comment, "I do value the BSBI very highly and feel it has done more for me than I have for it", any botanist who has enjoyed time in the field with him will surely respond by warmly applauding Arthur Copping's election as an Honorary Member of BSBI.

John Richards

DAVID PEARMAN, *'Algiers', Feock, Truro, Cornwall, TR3 6RA*; (dpearman4@aol.com)

John was another of several distinguished botanists who was a pupil at Leighton Park School and who was taught by John Ounsted. He did his degree at Durham (taught by David Bellamy among others), joining the BSBI in 1965. After a PhD at Oxford, on 'The biosystematics of *Taraxacum*' under David Valentine, he moved to Newcastle, rising to be Professor of Botany in 2002. He is our referee for *Epipactis* and *Primula*, and also, and mainly, for *Taraxacum*, where in addition to being the joint or sole referee for 40 years, he also co-authored our Handbook, published in 1997. This post must be one of our busiest. I well recall, inspired by the new handbook, I sent in my offerings in 1999, to have them gently rejected *in toto*, but with an encouragement to try harder! Alas! He is also our joint vice-county recorder for South Northumberland, succeeding the late George Swan in 2006, and very active in recording there. He was also on our Conservation Committee for many years from 1967, and as secretary for that, in 1972, issued our first 'Code of

Conduct', concerning the ethics of any collection of rare plants.

But there is far more to his life than the BSBI! John is not only a past-President of the Alpine Garden Society, but author of the standard monograph on *Primula* (1993, 2002), and also *Plant breeding systems* (1986, 1997). The articles that gave most enjoyment to me were those on plant-hunting in the AGS magazine, principally on Greece, culminating in 'Mountain flower walks: the Greek mainland' (2008). The prose was so infectious that one wanted to pack one's bags straight away! He has led many many tours for the AGS.

When I was President of the BSBI in the 1990s, John was one of the two gurus of last resort when I was stuck! He had two spells as a vice-president (1987-1991, 2001-2005) and was one of the 'Gang of Four' (with Arthur Chater, Frank Perring & Clive Stace) who helped to streamline running of the day-to-day matters of the BSBI by recommending the setting-up of the Executive Committee in 1991. This will seem like a small and very arcane step to most of you, but at a stroke it enabled the Society to function far more effectively by acting as the much more mobile forum of half-a-dozen people to clear matters before coming to the Council of 25-30 members. Many times in the 1990s I would seek John's help in getting matters into proportion – he never failed!

It gives me great pleasure to propose John for honorary membership.

RECORDERS AND RECORDING

Panel of Referees and Specialists

MARY CLARE SHEAHAN, *61 Westmoreland Road, Barnes, London, SW13 9RZ*; (m.sheahan@kew.org)

Mike Hardman, referee for *Viola*, asks that the reference to his website should be deleted as it is no longer active.

Chris Davis, general referee for Malvaceae, has left the Natural History Museum and moved to Arizona. However, he is still happy to receive emailed pictures for identification (chrisdavis@dbg.org).

Dr Damien Hicks has kindly agreed to take on *Ilex*. His address is: School of Biological Sciences, Room 4.05 Ashworth, King's Buildings, Edinburgh, EH9 3JT, (damien.hicks@ed.ac.uk). For identification he says a pressed specimen with fruits would be ideal.

Nick Stewart's address has changed, and is now: 'Banchory' Stirling Acres Road, Kirkcudbright, DG6 4ES. His email remains the same: nfstewart@freeuk.com

Panel of Vice-county Recorders

DAVID PEARMAN, *'Algiers', Feock, Truro, Cornwall, TR3 6RA*; (dpearman4@aol.com)

Any proposed changes will be reported to Records Committee, and discussed by them when they meet on October 2nd 2013.

Scottish vice-county recorder vacancies: Easterness & Dunbarton

JIM MCINTOSH, *BSBI Scottish Officer, Royal Botanic Garden, 20A Inverleith Row, Edinburgh, EH3 5LR*; (jim.mcintosh@bsbi.org.uk)

The Scottish Committee are looking for keen, fit botanists to fill Vice-county Recorder vacancies in Easterness and Dunbarton. The appointments are likely to be joint with existing (joint) Recorders as this has many advantages such as mutual support, a shared workload, learning from each other, *etc*. Living in or near the vice-county is an advantage, but is not essential - some Recorders live remotely and operate very successfully; but you would have to be able to spend significant time in the vice-county each year; perhaps three weeks' survey time per year.

Good Recorders are critical to the BSBI's success. The focus for all Recorders is helping to fulfil the aims set out in the BSBI's *Recording the British and Irish flora 2010-2020.* The principal task is the collection, validation and maintenance of vascular plant records in the vice-county on behalf of the BSBI. Being a reasonably competent botanist is important, but knowing one's limits is even more so. No one can be an expert in all aspects of a county's flora – especially when just starting out as a Recorder, and our referees are on hand to support and help on identifications and confirmations.

You would have the full support of the BSBI Scottish Committee, Scottish Officer and fellow BSBI staff and neighbouring and retiring Recorders are always happy to help with general advice and support. Competency with computers, particularly e-mail, the internet and MapMate, would be highly desirable (although some training can be provided).

Easterness, v.c.96

Easterness is the largest vice-county in the British Isles and one of the most important in Scotland. It is enormously varied, and includes coastal, riparian, semi-natural woodland, moorland and montane habitats – as well as a large part of the Cairngorm National Park. These montane habitats hold several important populations of rare species, such as *Carex lachenalii* (Hare's-foot Sedge), *Carex rariflora* (Mountain Bog-sedge), *Saxifraga rivularis* (Highland Saxifrage), *Salix lanata* (Woolly Willow) and *Phyllodoce caerulea* (Blue Heath). Fen habitats host *Carex buxbaumii* (Club Sedge) and *Carex chordorrhiza* (String Sedge), whilst the woodlands provide habitat for *Moneses uniflora* (One-flowered Wintergreen) and *Linnaea borealis* (Twinflower). Inverness was the subject of a major project that resulted in the publication of the excellent *Map flora of mainland Inverness-shire* in 1985.

Dunbarton, v.c.99

Despite being the third smallest Scottish vice-county, it has the sixth highest number of species. It straddles the Highland boundary fault, with low and fertile ground to the south, and more mountainous terrain to the north, culminating in Ben Vane and Ben Vorlich - its highest point at 941m. It includes Loch Lomond, Britain's largest freshwater lake, and much of the Loch Lomond and the Trossachs National Park. Apart from Loch Lomond and its islands, its key natural features are its extensive Atlantic oakwoods, the River Leven and the Clyde Estuary. It holds important populations of *Callitriche palustris* (Narrow-fruited Water-starwort), *Carex elongata* (Elongated Sedge) and *Rumex aquaticus* (Scottish Dock). Some 60,000 v.c.99 records were digitised by the Scottish Computerisation Project in recent years.

If you are interested in either of these vacancies, or would like to register a general interest in Scottish vacancies that arise from time to time, please e-mail me with your c.v. by 30th November.

Distance from recorder's home as a source of bias in plant recording

ANDY AMPHLETT, *72 Strathspey Drive, Grantown on Spey, PH26 3EY*;
(amphlett@grantownonspey.freeserve.co.uk)

Introduction

I have been actively botanising in Banffshire (v.c.94) since 2001, when I took on the role of vice-county recorder. My botanising has followed no carefully considered sampling strategy (*sensu* Groom *et al*., 2011), and I did not give much thought initially to the hectad coverage I and others were achieving, yet much has been achieved.

In the 2011 edition of *BSBI Recorder*, Banffshire was reported to be one of only 19 vice-counties in Great Britain with greater hectad coverage in the decade 2000 – 2009 than in the date class 1987 – 1999. So something was obviously going right, and, overall, coverage is now probably on a par with that achieved in 1970-1986. The other striking improvement compared with pre-2000 recording is that the spatial precision of records has increased markedly. Records at monad or better precision increased from 30 to 98% of records, and at 100m resolution from 17 to 52%. Since 2007, 99% of my own records have been at 100m resolution. My contribution amounts to about 60% of the post 2000 records. The majority of the remainder have been made by Ian Green (vice-county recorder for v.c.95).

While my own recording did not follow a detailed sampling strategy, it was not entirely *ad hoc*. I endeavoured to get to know the vice-county reasonably well; consciously went to locations that I had not been to before, or for which there were no localised records; followed up old records of interesting species; went to some of the 'classic' botanical hotspots; and persuaded my family to take holidays here, allowing me to spend some time botanising at the furthest extremity of the vice-county. Sometimes I just set off from home, and decided where to go en route. I rather suspect that my approach was not dissimilar to previous vice-county recorders in the county.

BSBI's recording strategy (Walker *et al*., 2010) has as a key requirement that all vice-counties should move to an ongoing recording programme to achieve at least sample coverage within all hectads in their vice-county between 2000 and 2019, and that records should be made at a minimum of tetrad resolution, and at greater precision for the more notable taxa. I felt I was well on the way to achieving this.

However, when I read the BSBI's *Guidance on sampling approaches* (Groom *et al*., 2011), I was left feeling somewhat nonplussed. I realised that the approach I had been taking for the previous decade was not only not recommended in the guidance, it was not even included, unless it fell within the '*ad hoc*' category, which rather disparagingly was described as providing 'map fillers'. Examining the example maps in the guidance document, illustrating how an unbiased sample of grid squares could be selected, I realised that an underlying issue was being ignored: distance. The underlying assumption is that actually getting to all the chosen sample squares does not in itself affect recording effort. This might be the case where a vice-county is blessed with a team of enthusiastic recorders, but for a vice-county recorder operating in a vice-county with few or no other active botanists, this may not apply. I therefore decided to investigate if there was any spatial bias in my own recording.

Method

I extracted all v.c.94 records for the period 2001 – 2011 from my copy of MapMate, and then filtered out those records where I was the sole or joint recorder (n = 28,365). Precision of the site grid references varied from 1m to 1km, and so I converted all to monad resolution. I then calculated the linear distance from my home monad to the monad of each record, using basic geometry. The records were then

allocated to 5km radius distance bands from my home. Using GIS software, I calculated the area of v.c.94 in 5km radius bands centred on my home.

Results

Over the 11 year period, the number of records I made per year ranged from 246 to 6328 (median 2527). I collected records on 11 to 48 days per year (median 27 days), and the number of records collected per day ranged from 1 to 523 (median 73).

Between 2002 and 2006, the mean distance from my home to each plant record made was 36.7km. This distance then declined year on year to 2010, when the mean distance was 25.9km. In 2011 the mean distance increased to 33.4km.

Converting the raw data of number of records per 5km radius band to records per km^2 gives a clear impression of how my recording 'effort' varied with distance from my home (Figure 1).

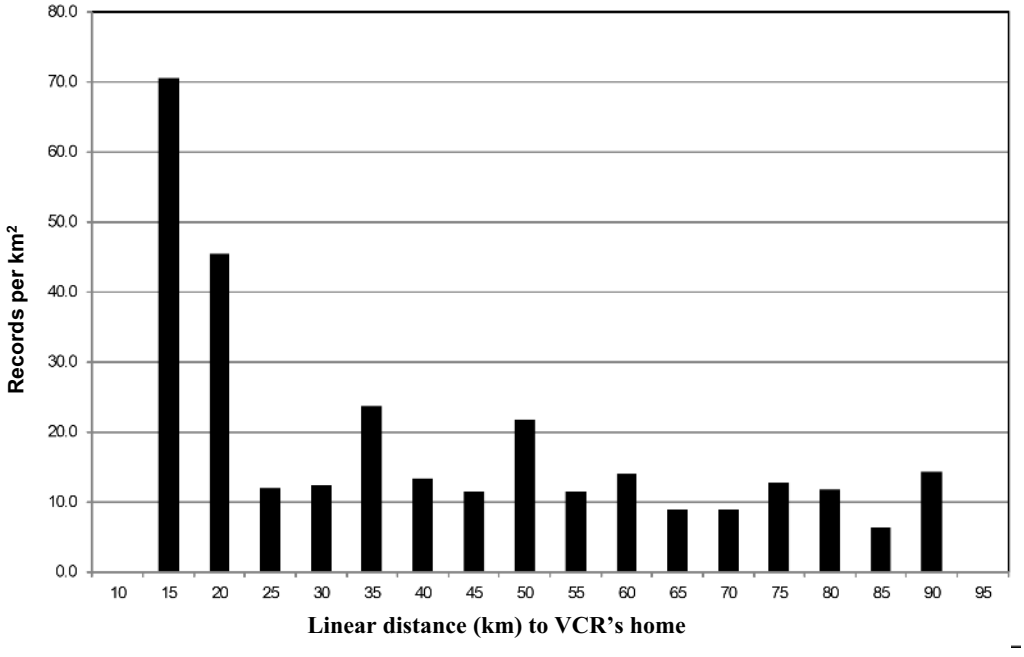


Fig. 1. Records per km^2 vs. distance to VCR's home.

From 20 to 90km, there was no significant decrease in recording intensity (r_s = -0.27, n = 14). Median number of records was 12.2 per km^2 (range 6.4 – 23.7). In contrast, between 10 and 20kms, median number of records per km^2 was 57.9, almost a five-fold difference. The closest point in v.c.94 from my home is 8km, a hill top that I have been to but not botanised at. The subsidiary peaks in recording intensity at 35 and 50km, refer to preferred recording locations that also have good road access. The peak at 90km reflects where I have stayed on holiday with my family.

The bias in recording is further revealed when the raw data for number of records is calibrated against the actual area of v.c.94 within each 5km radius distance band (Figure 2).

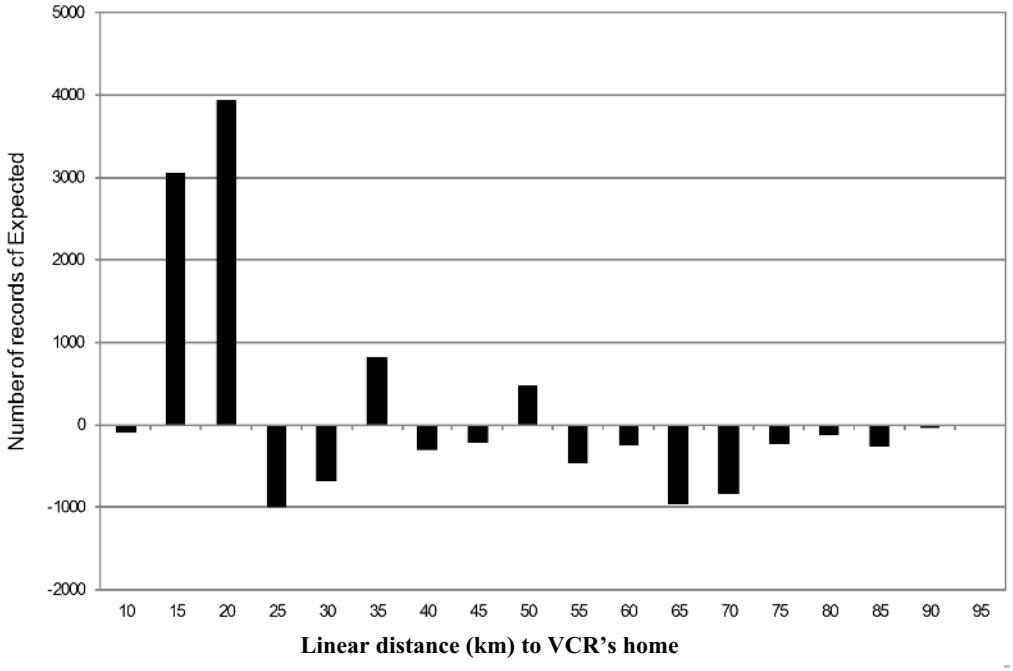


Fig. 2. Number of records per 5km radius distance band minus number of records that would have been expected if recording was proportional to area within v.c.94.

Values greater than zero are distance bands where there is a positive recording bias, negative values indicate relatively under-recorded bands.

Discussion

My recording in v.c.94 displays a pronounced bias to locations within 20km of my home. My recording has been a mix of full and part days, and between 2007 and 2010 I was increasingly reluctant to travel as far as in earlier years. Fuel costs, wear and tear on an ageing car, and an uneasy feeling that clocking up hundreds of miles by car was not a very 'green' thing to be doing, all contributed to this bias. I suspect that much volunteer recording will be subject to similar bias, and that this is unavoidable, though hitherto unrecognised or ignored.

Where there are several active field botanists living at widely scattered points across a vice-county, this spatial bias in recording may effectively be masked. But in the situation where only the vice-county recorder and one or two others are active recorders, this bias needs to be taken into account.

Given my predilection for botanising fairly close to home, I calculated the areas of all vice-counties within a 20km radius of my home. Banffshire only occupies 16%, while v.c.95 occupies 59% and v.c.96 25%. Perhaps where botanists are thin on the ground, it would be better if they displayed a less parochial attitude to their 'patch' and botanised more widely and thoroughly within that distance band in which they are content to travel.

References:

GROOM, Q., WALKER, K., & MCINTOSH, J. (2011). *Recording the British and Irish flora 2010 –2020*. Annex 1: *Guidance on sampling approaches*. Botanical Society of the British Isles, London.

WALKER, K.J., PEARMAN, D.A., ELLIS, R.W., MCINTOSH, J.W. & LOCKTON, A. (2010). *Recording the British and Irish flora, 2010-2020*. Botanical Society of the British Isles. London

'Stochophyte' lists and updating Rare Plant Registers

ROBIN M. WALLS, *10 Old Brickfields, Broadmayne, Dorchester, Dorset, DT2 8UY*; (robin@rmwalls.plus.com)

A few years ago I took over as vice-county recorder for Dorset from David Pearman and Bryan Edwards. They had produced a Rare Plant Register in 2004 and passed the master spreadsheet to me. Several years after this, Bryan Edwards issued a list of all the records on the RPR that had not been seen for a long time, or we had reason to think might have disappeared. This has proved very useful in updating records.

On taking over as vice-county recorder, I have updated it and asked people to also tell me if they have searched a site and not found the target species, preferably adding a reason, if it is obvious (like development, ploughing etc). With luck, we get a species list for the site which might indicate a change in habitat, whether the species is found or not. At some point, after several competent people have searched and failed, I will declare the species 'extinct at the site' - usually a good way of getting it found !

I also added to the list some aliens I would like to keep an eye on, some 'new taxa' that we might have (*e.g. Bolboschoenus laticarpus*) and various splits or subspecies of otherwise well recorded taxa. Because the list now had a heterogeneous list of species, I needed a handy name. 'Axiophyte' has already acquired a different usage, and in any case, not all the species were 'worthy'. The classical Greek word *stochos*, meaning target or aim seemed appropriate to describe species we were looking for, whatever the reason, hence '*stochophyte*'.

The word 'stochastic' of course has the same root and is said to have been suggested by the random pattern of arrows around a bulls-eye on a target. Perhaps this is a good way of describing our ambling about looking for plants that are often small and insignificant, except for the fact that they are rare in our vice-county.

OBITUARY NOTES

CHRIS LIFFEN, *3 Grangecliff Gardens, LONDON, SE25 6SY*; (c.liffen@btinternet.com)

Since the publication of *BSBI News* **123**, we regret to report that the news of the deaths of the following members has reached us. We send regrets and sympathies to all the families.

Mrs E M Clarke, 16 Greenfield Road, Stonesfield, Witney, Oxon, OX29 8EQ. She joined the BSBI in 2006

Mr H L Davies, 66 Link Lane, Wallington, Surrey, SM6 9DZ. He joined the BSBI in 1974.

Mr K J S Devonald, 22 Sandyke Road, Broad Haven, Haverfordwest, Dyfed. SA62 3JL. He joined the BSBI in 1980

Sir T W J D Dupree, Bt., Little Fircliffe, Whitworth Road, Darley Dale, Matlock, Derbyshire, DE4 2HJ. He joined the BSBI in 1953.

Mr F N Hepper BSc FLS, 25A Montague Road, Richmond, Surrey, TW10 6QW. He joined the BSBI in 1950 and was BSBI referee for *Sagina* and the *Silene nutans* agg.

Mr J Milligan, 40 Glendale Avenue, Choppington, Northumberland, NE62 5AN. She joined the BSBI in 1981.

Dr D J B White, Skerries, Pintail Drive, Blakeney, Holt, Norfolk, NR25 7DF. He joined the BSBI in 1960.

Obituaries of many will appear in *BSBI Yearbook 2014*.

BOOK NOTES

JOHN EDMONDSON, Book Reviews Editor, *243 Pensby Road, Heswall, Wirral, CH61 5UA*; (bsbireviews@mac.com)

The following titles are to be reviewed in current or future issues of *New Journal of Botany*. Unsigned reviews are by the editor.

AKEROYD, J. (ed.) *et al*. *The wild plants of Bere, Dursey, Whiddy and other islands in Bantry Bay*. Sherkin Island Marine Station, 2013. €19.99 p/b. ISBN: 978 1 870492 48 5.

CRANE, PETER. *Ginkgo*. Yale University Press, New Haven & London, 2013. £25 h/b. ISBN: 978 0 300 18751 9.

GENT, GILL & WILSON, ROB. *Flora of Northamptonshire and the Soke of Peterborough.* Robert Wilson Designs, 2013. £39.95. ISBN 978 0 907381 03 7 h/b.

HARRAP, SIMON. *Harrap's wild flowers*. Bloomsbury, London, 2013. £16.99 p/b. ISBN: 978 1 4081 1360 8.

PETERKEN, GEORGE. *Meadows*. British Wildlife Publishing, 2013. (British Wildlife Collection no. 2). £29.95. ISBN: 978 0 956902 4 7 h/b.

SHORT, EMMA & GEORGE, ALEX. *A primer of botanical Latin with vocabulary.* Cambridge University Press, 2013. £24.99. ISBN 978 1 107693 75 3 p/b.

TRUEMAN, IAN C., POULTON, MIKE & READE, PAUL. *Flora of Birmingham and the Black Country*. The Birmingham and Black Country Botanical Society, The Wildlife Trust for Birmingham & the Black Country and EcoRecord, 2013. £45 incl. UK postage. ISBN: 978 1 874357 55 1.

WILKIN, PAUL & MAYO, SIMON J. (eds.). *Early events in monocot evolution*. Systematics Association special volume no. 83. Cambridge University Press, Cambridge, 2013. £60. ISBN: 978 1 107 01276 9 h/b.

NEWS OF MEMBERS

John Thackray Medal for 2012 awarded to Philip Oswald and Chris Preston

THE EDITORS from http://www.shnh.org.uk/awards/the-john-thackray-medal.html

Warmest congratulations to two of our Honorary members Philip Oswald and Chris Preston on being awarded the prestigious Thackray Medal for 2012 by the Society for the History of Natural History (SHNH) in 2012. (see photo p. 66).

The following notice is taken from the SHNH website: (http://www.shnh.org.uk/awards/the-john-thackray-medal.html

Instituted in 2000 to commemorate the life and work of John Thackray, Past President of the Society, this medal is awarded for a significant achievement in the preceding three years in the history of those areas of interest to the Society, that is the biological and earth sciences in the broadest sense.

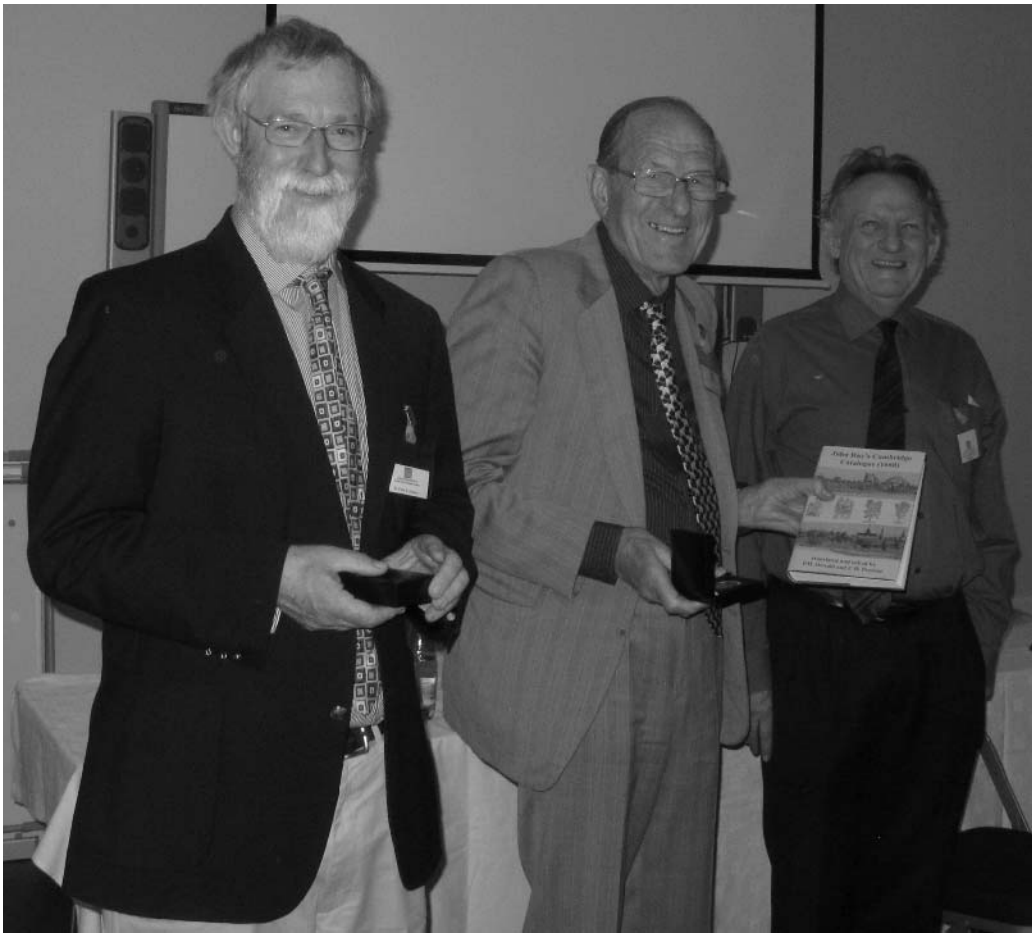
The John Thackray Medal

Recognition may be for a piece of work completed (*e.g.* the cataloguing of an archive collection), a publication (book or journal article), exhibition *etc*. Recipients may be individuals, teams or institutions.

SHNH Officers and Council are delighted to announce that the Thackray Medal 2012 has been awarded to John Ray's Cambridge Catalogue (1660), translated and edited by Philip H. Oswald and Chris D. Preston. London: Ray Society, 2011. ISBN 978-0903874434.

John Ray is the outstanding British natural historian of the 17th century. This 624-page book provides the first complete translation from the Latin of his first publication, *A catalogue of plants growing around Cambridge* (1660). [See *SHNH Newsletter* **101**: 14.]

In speaking of the award, SHNH President Hugh Torrens said: "This joint work was applauded by the panel, both for the fine collaboration it showed between a translator, from Latin, and a botanical historian, and for the deep levels of erudition and scholarship their joint work had revealed. It was felt to be a major contribution to both the study of John Ray, and to his botanical world, by rendering into modern English both Ray's first book, and our first British County Flora".



Chris Preston (l) and Philip Oswald (m) having just been presented with Thackray medals by the SHNH President, Hugh Torrens (r). Photo J. Oswald © 2013

NOTES FROM THE OFFICERS

From the Hon General Secretary – *LYNNE FARRELL*

41 High Street, Hemingford Grey, Cambs., PE28 9BJ:
(01480 462728) (lynneonmull@btinternet.com)

At this time of the year there is generally not much for me to say, and the updated Diary can be found on page 71, which gives you the forthcoming meetings both of all the Committees and the Annual meetings to be held in Edinburgh for Scotland on Saturday 2nd November and the Annual Exhibition meeting at the Flett Theatre area in the Natural History Museum, London on Saturday 23rd November. By the time you receive your *News* the Welsh AGM will have been held in Beaumaris and the Irish AGM in Killarney.

So, just for a change, I will leave my various BSBI colleagues to fill you in more on their aspects of the Society, which has made good progress evolving from the Botanical Society of the British Isles to the Botanical Society of Britain and Ireland.

However, Gwynn has suggested that I tell you a little bit about what I have been doing as a vice-county recorder (another of my roles). So, here is a very short version of my activities as a VCR since May.

Many of you will be aware that I have been undertaking a tetrad Flora of Mull, to record the changes that have taken place since the publication of the *Flora of Mull* (Jermy & Crabbe, 1978). Depending on how many of the islets you count (some are more above sea level than others), there are 332 tetrads covering Mull and its associated islands. Work began in 1996 and little did I know exactly how long it would take and what adventures it would lead me into. During this time, I have come to know both the landscape and the locals, and I am addicted to the area.

I had always thought that the last tetrad would probably be on some remote hillside with a long walk-in, but it proved to be three remote islets visited by sailing boat on Wednesday 7th August 2013. I was accompanied by several of my stalwart recorders and several locals who had also helped in one way or another.

The day began with rain but the forecast was good, set fair and with no swell and not much wind. We visited Eilean a'Chalmain, Maisgeir (see photo on back cover) and Erisgeir (the last being nearly missed due to the fact that it does not appear on the 2½ inch map, but luckily Ro Scott had brought along her 1:50,000 map, on which it was clearly marked). The local boatman, Mark Jardine, was up for the task and said it was the sort of adventure that was close to his heart, so we landed on two of the islets and recorded the other through binoculars, as landing was going to be difficult: 137 species on Eilean a'Chalmain, 20 on Maisgeir but only eight on Erisgeir. Maybe there is a need for another trip?

We broke open the champagne bottles somewhere off Staffa and were escorted back to Fionnophort harbour by a pod of Bottle-nosed Dolphins. They must have known it was a special occasion.

So now begins the serious business of writing up the new Flora. Of course, I still have tetrad-bashing to complete on Coll and Tiree, but that is for 2014. In the meantime, I have produced a Rare Plant Register for v.c.103, which can be viewed at www.bsbi.org.uk/MidEbudesRPR2013.pdf. I hope other VCRs have been enjoying recording in their own areas this year as much as I have enjoyed mine.

From the new Head of Operations – *JANE HOULDSWORTH*

16 Carlisle Street, Bromley Cross, Bolton, BL7 9JF;
(Tel.: 07584 250 070; jane.houldsworth@bsbi.org.uk)

I would like to extend a warm hello to all readers! At the time of writing, I have been employed at the BSBI for two and a half months and thought it was about time I introduced myself.

My name is Jane Houldsworth (though some fellow Lancastrians may know me as Jane Ashley) and I come to the BSBI following four years as Resources Officer at ENWORKS, an environmental business support programme that operates in the North-west of England. Before that I spent four years as Biodiversity Manager at the Lancashire Wildlife Trust, where I am now a trustee.

I attended the AGM in Anglesey, managing to meet many of you over the four days or so spent there. Apologies to those I did not get round to but I will be at the Recorders' Conference, Irish AGM and all Committee meetings and AEMs later this year, so I may get to meet many more of you then. To help you recognise me there is a photo on the inside of the back cover.

The Head of Operations post is a new one for the BSBI and I think the need for it reflects the breadth and scale of the operations the Society now undertakes. The role involves working closely with all staff, trustees and committees to look at what we do, how we do it, what we can improve on and what we want to do more of. The upshot of this will be the production of a strategic plan for the Society that sets out where we plan to allocate our precious resources, what priorities we should focus on and what goals we want to achieve. The overall aim of this is to strengthen the Society and its reputation as the lead botanical organisation in Britain and Ireland and, most importantly, ensure that members get what they want from it.

All my contact details are given above and I would welcome any thoughts, comments or suggestions you might have. Alternatively, if you would rather just get in touch to say hello, please feel free to do so.

From the acting Welsh Officer – *PAUL GREEN*

c/o Biodiversity & Systematic Biology, National Museum of Wales, Cardiff, CF10 3NP;
(Tel.: 02920 973152; welshofficer@bsbi.org.uk)

This is not quite the update I thought I would be writing for the next *BSBI News*! As many of you are aware, I had to take several months off work because of having treatment for cancer; the worst time to be off work, as it was peak summer and over a very sunny period.

Thank you

I would like to take this opportunity to thank BSBI members for the cards, letters and emails I received, and their support, help and encouragement, while I was recovering; in particular Tim Rich, who was there each time I needed a shoulder to lean on. He encouraged me to go out Dandelion collecting in my free time to help me take my mind off my illness. There is an amazing amount of work put into each specimen collected.

Next year I have arranged with John Richards to run a *Taraxacum* workshop in the Bangor area of north Wales in late April. I would also like to thank Helena Crouch, who each Tuesday afternoon while I was convalescing took me out for a couple hours. We normally went to look for a species near Yeovil, which needed updating for the Somerset Rare Plant Register. Finally, Seán Meehan for leading a walk I should have led at Bunclody, Co. Wexford and Elsa Wood, who stepped in at the last minute to help run a grass identification workshop that I was supposed to be running.

From the Irish Officer – *MARIA LONG*

c/o National Botanic Gardens, Glasnevin, Dublin 9, Ireland;
(Tel.: 00 353 87 2578763; email: maria.long@bsbi.org.uk)

What wonderful weather we have had this summer, and definitely overdue! And the BSBI in Ireland have been making full use of it. We have had a number of successful field outings (one that I attended had 22 participants!), as well as some local educational outings additional to the schedule. The season kicked off with an outing in Wexford in May, with *Lamiastrum galeobdolon* ssp. *montanum* centre-stage. Since then, there have been weekend outings in Mayo, Kerry, Sligo/Leitrim (see photo p. 70) and Donegal. Day meetings took place in Armagh, Galway, Tipperary, Westmeath and Wicklow. Highlights include the fact that the leader of the Connemara trip narrowly survived a mutiny – the attendees were having such a good time on the beach/coast on a stunning day, that visiting the bogs inland suddenly lost its appeal!

The additional local training days took place largely in and around Galway, due to a number of enthusiastic new botanists in that area, and, of course, willing vice-county recorders. We hope to build on these, and I have had expressions of both interest in learning, and also willingness to help/volunteer, from a number of people across the country. This is extremely encouraging. Capitalising on such interest will be an important task for me over the coming months.

I have set up a Facebook page for BSBI Ireland with the help of a member, Caoimhe Muldoon (https://www.facebook.com/pages/BSBI-Botanical-Society-of-Britain-Ireland-Irish-section/518954561473019?hc_location=stream). This has been a great success. It has opened up the world of BSBI to a whole new set of (mainly young) people. Check it out to see photos from some of the field trips, as well as other interesting natural history bits and pieces. Over 125 people have 'liked' our page, and as far as I know, only two of those are vice-county recorders. Given that the Irish membership is less than this number, and the probability that the majority of the 'likes' come from non-members, this can only be seen as a great reaching-out success.

By the time you read this the Irish AGM will have taken place in Killarney (Saturday 14th and Sunday 15th September). Also planned for the autumn and winter months (though no dates yet), are some MapMate workshops, and perhaps some other technical-themed get-togethers (*e.g.* using databases to manage records, the DDb, etc.). I also hope to put some work into the Irish webpage on the BSBI website. And don't forget the final field meeting of the year – 16th November at Tara Hill in Wexford, lead by Paul Green.

As usual, please do get in touch with any questions, suggestions, or anything else, whether you be a vice-county recorder, a member, or otherwise. I am always glad to hear from people, and keen to help and provide information where I can.

BSBI members scrambling in Glencar Valley, Leitrim (H29), 14th July 2013. Photo M. Long © 2013. In the photo, l-r: VCR Don Cotton, members - Kylie Jones, Caoimhe Muldoon, Damhnait Muldoon

STOP PRESS

Developments at the National Museum of Wales

The Committee for Wales and its Chairman Delyth Williams would like to express their profound regret at the situation developing in the Vascular Plant Section at the National Museum of Wales.

Tim Rich was unsuccessful in his application for the new Head of Botany post and his role as Head of Vascular Plants has come to an end. He is now faced with the choice of applying for a lower grade post or redundancy, as are other members of the curatorial staff.

Consequently, the situation regarding the curation of the Herbarium and the provision of botanical services in general looks to be very unsatisfactory for the future. This has been brought about by a 40% cut in the Museum's budget by the Welsh Assembly Government which would appear to be very short sighted, particularly as they are always saying that they are keen to encourage science!

I, too, would like to express my dismay at the way one of the best taxonomic botanists in Britain has been treated by the institution at which I worked for almost 30 years. I am sure all members will join with me in hoping that even at this eleventh hour some way will be found to keep the Vascular Plant Section staffed by the same botanists at a level commensurate with their expertise and standing. RGE

Diary for Autumn 2013

LYNNE FARRELL, Hon. Gen. Sec., *41 High Street, Hemingford Grey, Cambs., PE28 9BJ*; (lynneonmull@btinternet.com)

2013

2 Oct Records Committee
16 Oct Training & Education Committee, Shrewsbury
17 Oct Publications Committee (note change of date)
23 Oct Council, Linnean Society, London
26 Oct Welsh Committee, Aberyswyth
2 Nov Scottish AGM & Annual Meeting, Edinburgh
6 Nov Board of Trustees, 2pm, Linnean Society, London
23 Nov Annual Exhibition Meeting, Natural History Museum, London

2014

4-7 Jun BSBI AGM, Birnam, Dunkeld near Perth

Solutions to Botanical Crossword 20

Across

1. COBNUTS; 5. GUMTREE; 8. WOODSIA; 9. LLOYDIA; 10. LIMESTONE; 11. SPOOR; 12. PYRUS; 14. BEDSTRAWS; 15. MOSCHATEL; 17. SAGES; 20. SCRUB; 21. LICHENOSE; 23. ENDARCH; 24. ORGANIC; 25. SOLANUM; 26. SATISFY.

Down

1. COWSLIP; 2. BLOOMER; 3. UISTS; 4. STAR OF BETHLEHEM; 5. GOLDEN DELICIOUS; 6. RADIOLA; 7. EPACRIS; 11. SITES; 13. SAHIB; 15. MASTERS; 16. STRUDEL; 18. GROUNDS; 19. SKETCHY; 22. ERGOT.

Crib to Botanical Crossword 20

Across

1. COB/NUTS; 5. pun; 8. WOODS/1/A; 9. anag: DO A LILY; 10. LIME'S/TONE; 11. alaS POOR plant-hunters; 12. anag: SYRUP; 14. anag: BEST WARDS; 15. anag: SOME LATCH; 17. double definition; 20. dd; 21. like a nose; 23. END/ARCH; 24. anag: GRAIN CO; 25. SOL/A/NUM(B); 26. anag: STAYS IF

Down

1. C<OWS>LIP; 2. dd; 3. anag: SUITS; 4. dd; 5. charade; 6. RADIO/LA; 7. reverse: SIR/CAPE; 11. SIT<E>S; 13. anag: I BASH; 15. M/ASTERS; 16. ST/RUDE/L; 18. dd; 19. SKETCH/Y; 22. formER GOThic

CONTRIBUTIONS INTENDED FOR *BSBI NEWS* 125 should reach the Receiving Editor before December 1st

The General Editor Gwynn Ellis can be contacted by answerphone or fax on 02920 496042 email: rgellis@ntlworld.com / membership@bsbi.org.uk
The Receiving Editor Trevor James can be contacted by phone on 01462 742684 or email trevorjjames@btinternet.com

BSBI News (ISSN 0309-930X) is published by the Botanical Society of the British Isles
Enquiries concerning the Society's activities and membership should be addressed to: The Hon. General Secretary, c/o Dept. of Botany, The Natural History Museum, Cromwell Road, London SW7 5BD Tel: 0207 942 5002.
Camera ready copy produced by Gwynn Ellis and printed by J. & P. Davison, 3 James Place, Treforest, Pontypridd, Mid Glamorgan CF37 1SQ (Tel. 01443-400585; email: davison.litho@talktalkbusiness.net)

ADMINISTRATION and IMPORTANT ADDRESSES

PRESIDENT
Dr Ian Denholm
4 High Firs Crescent, Harpenden, Herts., AL5 1NA
Tel.: 01582 760180 (home), 07974 112993; i.denholm@herts.ac.uk

HON. GENERAL SECRETARY
Miss Lynne Farrell
41 High St, Hemingford Grey, Cambs, PE28 9BJ
Tel.: 01480 462728; lynneonmull@btinternet.com

HON. TREASURER
Mr Antony Timmins
154A Warley Hill, Brentwood, Essex, CM14 5HF
Tel.: 01277 202545; antony.timmins@hotmail.co.uk

MEMBERSHIP SECRETARY (**Payment of Subscriptions** and changes of address) & ***BSBI NEWS*** **GENERAL EDITOR**
Mr Gwynn Ellis
41 Marlborough Road, Roath, Cardiff, CF23 5BU
(Please quote membership number on all correspondence; see address label on post, or Members List)
Answerphone & Fax. 02920 496042; membership@bsbi.org.uk; rgellis@ntlworld.com

HON. FIELD SECRETARY (including enquiries about Field Meetings)
Dr Jill Sutcliffe
Ingrams Farm, Fittleworth Road, Wisborough Green, Nr Billingshurst, West Sussex, RH14 0JA
Tel.: 01403 700395; jillsutcliffe1@gmail.com

HON. ASSISTANT SECRETARY (General enquiries)
Roy Vickery
BSBI c/o Dept. of Botany, The Natural History Museum, Cromwell Road, London, SW7 5BD
Tel.: 02086 756740; vickery330@btinternet.com

PANEL OF VICE-COUNTY RECORDERS (Comments and/or changes of address)
Mr David Pearman
Algiers, Feock, Truro, Cornwall, TR3 6RA
Tel.: 01872 863388; dpearman4@aol.com

PANEL OF REFEREES & SPECIALISTS (Comments and/or changes of address)
Dr Mary Clare Sheahan
61 Westmoreland Road, Barnes, London, SW13 9RZ
Tel.: 02087 484365; m.sheahan@kew.org

***NEW JOURNAL OF BOTANY*- RECEIVING EDITOR**
Dr Richard Gornall
Biology Dept., University of Leicester, Leicester, LE1 7RH
Tel.: 01162 523394; njb@bsbi.org.uk

***NEW JOURNAL OF BOTANY* - BOOK REVIEWS EDITOR**
Dr John Edmondson
243 Pensby Road, Heswall, Wirral, CH61 5UA
Tel.: 01513 428287; a.books@mac.com

***BSBI NEWS* RECEIVING EDITOR**
Mr Trevor James
56 Back St, Ashwell, Baldock, Herts, SG7 5PE
Tel.: 01462 742684; trevorjjames@btinternet.com

HEAD OF RESEARCH & DEVELOPMENT
Dr Kevin Walker
97 Dragon Parade, Harrogate, North Yorkshire, HG1 5DG
Tel.: 01423 538553 or 07807 526856; kevinwalker@bsbi.org.uk

HEAD OF OPERATIONS
Ms Jane Houldsworth
16 Carlisle Street, Bromley Cross, Bolton, BL7 9JF
Tel.: 07584 250070; jane.houldsworth@bsbi.org.uk

BSBI CO-ORDINATOR & Research Fund applications
Mr Alex Lockton
34 Gordon Road, Whitstable, Kent CT5 4NF
Tel.: 01227 504674 or 07552 234791; coordinator@bsbi.org.uk

BSBI PROJECTS OFFICER
Mr Bob Ellis
11 Havelock Road, Norwich, NR2 3HQ
Tel.: 01603 662260; bob@elymus.demon.co.uk

BSBI SCOTTISH OFFICER
Mr Jim McIntosh
Royal Botanic Garden, Inverleith Row, Edinburgh, EH3 5LR
Tel.: 01312 482894; jim.mcintosh@bsbi.org.uk

BSBI WELSH OFFICER (acting)
Mr Paul Green
c/o Welsh National Herbarium (NMW), Dept. Biodiversity & Systematic Biology, National Museum Wales, Cardiff, CF10 3NP
Tel.: 02920 973152 or 0772 111113; welshofficer@bsbi.org.uk

BSBI IRISH OFFICER
Dr Maria Long
National Botanic Garden, Glasnevin, Dublin 9, Ireland
Tel.: 00 353872 578763; maria.long@bsbi.org.uk

BSBI DATABASE OFFICER
Mr Tom Humphrey
CEH, Maclean Building, Benson Lane, Crowmarsh Gifford, Wallingford, Oxon, OX10 8BB
Tel.: 01491 692728; tomhumphey@gmail.com

BSBI ADMINISTRATIVE OFFICER (All financial matters **except Membership**)
Dr Clive Lovatt
57 Walton Road, Shirehampton, Bristol, BS11 9TA
Tel.: 01173 823577 or 07513 458921; accounts@bsbi.org.uk

BSBI SCIENTIFIC OFFICER
Dr Pete Stroh
Cambridge University Botanic Garden, 1 Brookside, Cambridge, CB2 1JE
Tel: 01223 762054; peter.stroh@bsbi.org.uk

BSBI PUBLICATIONS
Mr Paul O'Hara
c/o Summerfield Books, Unit 12, Skirsgill Business Park, Penrith, Cumbria, CA11 0FD
Tel.: 01768 210793; Fax 01768 892613; info@summerfieldbooks.com

BSBI WEBSITE ADDRESS
www.bsbi.org.uk

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Fig. 1. Japanese Knotweed *s.l.* seedling in gutter on main University of Leicester campus

1. Huddersfield Narrow Canal before restoration: cascaded locks about 1980

2. Huddersfield Narrow Canal, June: *Nymphoides peltata*, the only abundant floating-leaved species in the Narrow Canal, with *Typha latifolia*, while on the far side of the canal is extensive *Equisetum fluviatile*

Fig. 2. Japanese Knotweed *s.l.* seedlings growing at the Botanic Gardens in Oadby (Leicester)
Both photos J. Bailey © 2013 (see p. 55)

3. Huddersfield Broad Canal, July : floating-leaved *Potamogeton natans* and abundant *Glyceria maxima* on the far side of the canal

4. Stolon-linked rosettes of *Luronium natans* in the Broad Canal, July : floating alongside the wash wall shortly after passage of the boat illustrated in the previous photograph (light boat traffic may favour this species)

Photo 1 M. J. Morphy© 1980; Photos 2-4 R. Goulder © 2012 (see p. 7)

Illustrations showing introgression between *Cirsium arvense* and *C. palustre*. Photos M. Wilcox except where stated and most taken in July (see p. 17)

Fig. 1a-c, left to right. Typical *Cirsium arvense*, (1a-b) Block Eary, IOM, SC3890; (1c) Clitheroe, SD7338.

Fig. 2a-c, left to right. Hybrid fitting the description in Stace (2010) but hairy (2a-b) Delnabo, Scotland, c.NJ1616, v.c.94, part of a hybrid swarm in this field; (2c) Weymouth, waste ground c. tetrad SY6680 near Radipole Lake, and seen in Dorchester and some surrounding areas.

Cirsium hybrids continued:

Fig. 3a-c, left to right. (3a) Otley, SE1945, v.c.64; (3b) Worsaw Hill, Clitheroe, c.SD7743, these were spiny-winged for most of stem and hairy, also in Clitheroe on waste ground, SD7338; (3c) Bradford, Four Lane Ends, c.SE1333, spiny-winged, sparsely hairy; all three showing more blue-green leaves, the pale stripes more typical of *C. arvense* can be seen in the stem of 3a and 3c (see 1b and 1c)

Fig. 4a-c, left to right. (4a) Tentsmuir NR, Scotland, NO5027, v.c.85; (4b) Eary Cushlin, IOM SC2253 7621, v.c.71 M. Wilcox & B.A. Tregale (photo B.A. Tregale), 2013; (4c) one type of Marsh Thistle, IOM, Curraghs, SC3695, v.c.71. Other hybrids seen elsewhere, far too many to show here and often not recorded, as it is only my opinion. Introgression is usually toward Creeping Thistle though very rarely some hybrids are closer to Marsh Thistle. I see no reason why these are not hybrids; they seem at the very least obviously intermediate. The ones shown here are mostly good hybrids.

Polycarpon tetraphyllum in Aveley (v.c.18).
Photo: Patrick Smith © 2013 (see p. 19)

Campanula garganica, Plymouth Hoe, habitat with detail inset.
Photos P. Pullen © 2013 (see p. 53)

Fascicularia bicolor with Hottentot Fig on rocks, Isles of Scilly. Photo J.E. Oliver © 2013 (see p. 52)

Fig. 3. Photograph of *Angelica heterocarpa* at Nantes from Jibi44, 7th July 2013, accessed at https://commons.wikimedia.org/wiki/User:Jibi44 (file licensed under the Creative Commons Attribution-Share Alike 3.0 unported license) (see p. 37)

Huperzia selago near Dietmannsried, Bavaria, Germany on 9th March.
Photo: B. Sonnberger © 2013 (see p. 18)