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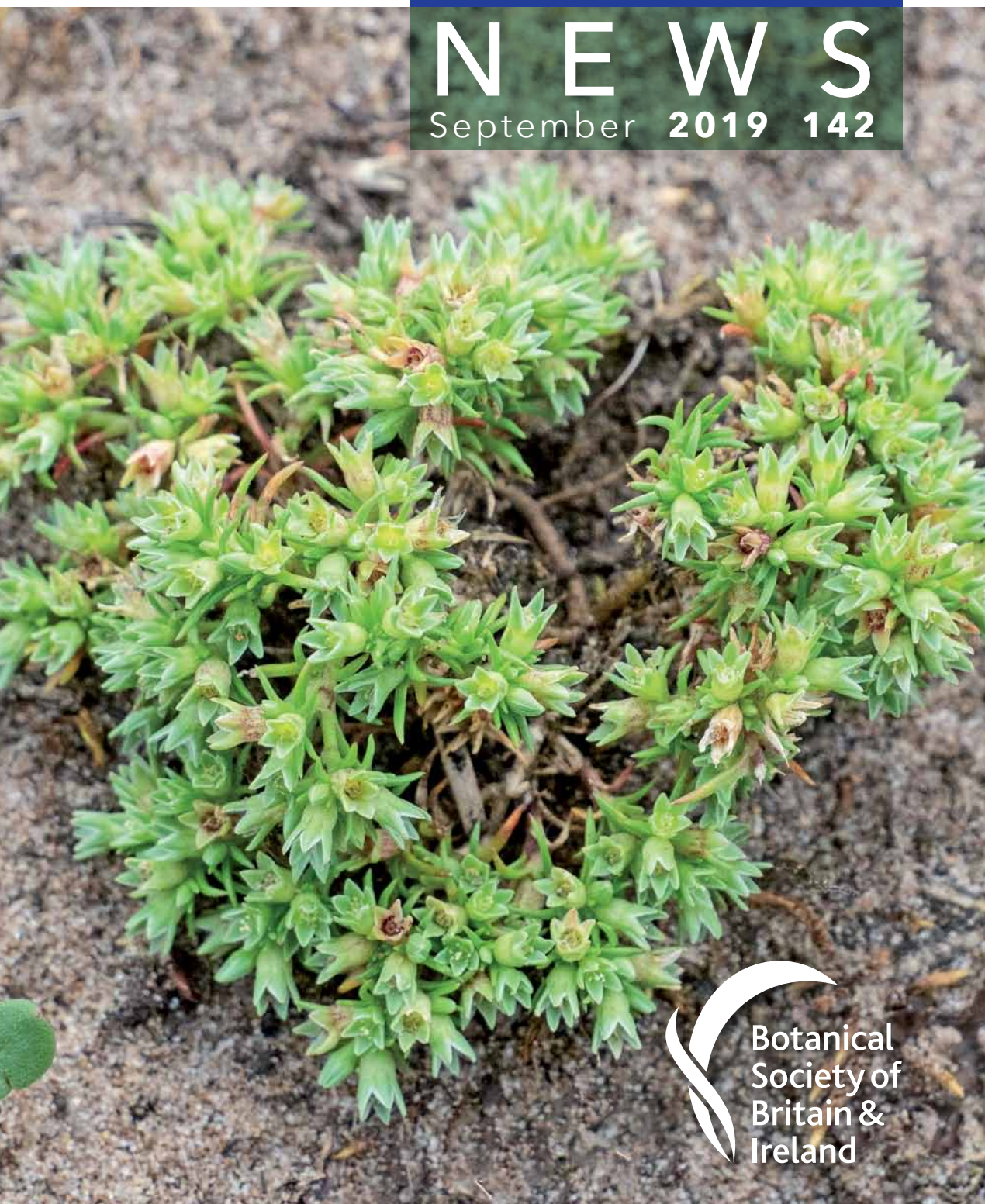

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Front cover *Scleranthus annuus* (Annual Knawel), at Freshfield Dune Heath (see p. 24). *Philip Smith*

Contributions for the next issue of ***BSBI News*** (no. 143) should be sent to the Editor John Norton (**john.norton@bsbi.org**) by **27th November 2019**.

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Botanical Society of Britain & Ireland

FROM THE PRESIDENT

Time flies! It seems only yesterday that I took over as President and, yet, here we are in 2019 and I am about to hand over to Lynne Farrell to steer the Society for the next couple of years.

It is also the end of a special era. Atlas 2020 recording has almost finished and we are on target to make the results available in due course. This is a huge task almost accomplished. However, as you will know we have been planning for the future. You will recall that the January 2019 issue of *BSBI News* contained a report of a survey asking what scientific work the BSBI should do next. By the time you read this, BSBI Council will have whittled the choices down to a shortlist for further consideration at its November meeting, when a final decision will be made setting the agenda for at least a few years to come.

In fact, Council has been rather busy! It has decided that there should be an 'English Committee' to support Pete Stroh, as England Officer, based on the model of the other country officers. Work has also been ongoing in developing a specification for an online data entry system to allow direct entry of records onto the Ddb and a final draft of the BSBI's new Conservation Policy document has just arrived in my inbox, ready for final consideration by Council and the Trustees in due course.

Finally, work will begin in earnest over the next few months on the HLF-funded resilience review, making sure BSBI is fit for purpose in the decade to come and beyond. Nothing like leaving one's successor with some work to do! I wish Lynne all the best for her Presidency, and hope that I have not left her too many loose ends to tie up!

Chris Metherell
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EDITORIAL

I hope you enjoy this issue of *BSBI News*. There is a recurring theme of concerns about invasives, both native and non-native, which I hope you will find thought provoking.

This is my last issue as I am handing over the reins to John Norton of Gosport, Hampshire. John has been an active BSBI member for more than 32 years and, as well as running an independent ecological consultancy, has expertise in publishing, producing the excellent *Flora News* for the Hampshire Flora Group, among other things.

I have very much enjoyed my time as *BSBI News* editor and would like to thank all those who have helped me over the last two years, particularly Gwynn Ellis and those who have supplied such excellent material, especially the team of regular contributors.

Andrew Branson
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Beyond mapping: the BSBI's work on invasive non-native species

KEVIN WALKER

Lysichiton americanus (American Skunk-cabbage). *David Knott*

In this edition of *BSBI News* Nick Millar takes issue with the celebratory way in which the discovery of alien plants is often reported, and the Society's apparent inactivity in dealing with potentially invasive non-native species (see page 79). In this article I would like to counter the latter suggestion by describing the significant work that BSBI is already undertaking on invasive non-native plants largely for the GB Non-Native Species Secretariat (NNSS – www.nonnativespecies.org). This programme of work is funded by Defra and is a collaboration between BSBI, the Centre for Ecology and Hydrology (CEH), the British Trust for Ornithology (BTO) and the Marine Biological Association (MBA), with a central focus of providing information on non-native species via the GB Non-Native Species Information Portal (GB NNSIP – www.nonnativespecies.org/factsheet/). Collectively, the GB NNSIP team, including the volunteers and scientists they represent, have made an enormous contribution to Britain's capacity to deal with non-native species (Roy *et al.*, 2015). And here is why…

Early warning and surveillance

The first step to tackling invasive non-native species is to develop a robust surveillance system that tracks arrivals and subsequent spread. To this end the NNSS and its partners have developed a 'species alert' system that collates occurrence records for a range of highly invasive non-native species (www.nonnativespecies.org/alerts/index.cfm), from a variety of sources, including the general public and national recording schemes such as those organised by BSBI. These records are then used by land

An example of when it all goes wrong. *Ludwigia grandiflora*, Limoges, France. *Trevor Renals*

management organisations to target eradication and control operations. For example, the 'alert' system is routinely used to identify new occurrences of potentially invasive aquatic plant species, such as *Ludwigia* (water-primroses) and *Myriophyllum* (water-milfoils), that have been identified as a high priority for eradication and control owing to their invasive behaviour elsewhere in Europe (Plantlife, 2011; Roy *et al*., 2014a). These alerts currently focus on new arrivals that can be eradicated relatively early in the establishment process, whereas for aquatics, such as *Hydrocotyle ranunculoides* (Floating Pennywort), which has been spreading rapidly along British waterways and canals since 1990 (Newman & Dawson, 1999), BSBI distribution records are helping to target control operations and limit its further spread.

Future invasive non-native species

BSBI recorders are the 'eyes on ground' when it comes to invasive non-native plants, alerting others to potential threats from species that may have been overlooked by more formal assessments, e.g. *Allium paradoxum* (Few-leaved Garlic), *Cotoneaster* spp., *Lamiastrum galeobdolon* ssp. *argentatum*, *Lysichiton americanus* (American Skunk-cabbage) and *Pentaglottis sempervirens* (Green Alkanet). In addition, BSBI staff and volunteers have been involved in 'horizon scanning' to identify species that might become a problem given their ecological and climatic requirements and invasive behaviour elsewhere (Roy *et al*., 2014a). This resulted in a list of 30 high risk species, including four plants: *Baccharis halimifolia* (Tree Groundsel), *Myriophyllum heterophyllum* (Variable-leaved Water-milfoil), *Microstegium vimineum*, and *Nassella neesiana* (American Needle-grass), at least one of which has since been recorded in Great Britain (Smith *et al*., 2017).

Assessing impact

The impacts of non-native species on native ecosystems and communities have only been studied in detail for a handful of species in Great Britain. Consequently, expert opinion is often used to assess the levels of impact for most species. For plants, BSBI has been involved in two 'expert elicitation' studies. The first, carried out by NNSS, used a standard methodology where experts scored both current and maximum likely impact and confidence (these categories are taken from the *Framework and Guidelines for Implementing the Proposed IUCN Environmental Impact Classification for Alien Taxa*, known as 'EICAT') for a range of taxonomic groups, including c. 120 established non-native plants (Olaf Booy, in prep.). Subsequently, BSBI has

also worked with Katharina Dehnen-Schmutz of Coventry University to carry out a similar exercise with vice-county recorders, asking them to list the ten most invasive non-native species in their own vice-counties. This survey took place in the spring of 2019 and, given the high number of respondents (c. 80), should provide a more detailed assessment of impacts than the EICAT study. Finally, BSBI is also working with Katharina on a separate project on potentially invasive ornamental plants that are likely to 'jump the garden wall' into the wild. This project – *PlantAlert* – asks gardeners (not necessarily BSBI members) to submit records of ornamental plants that are spreading and difficult to control in gardens via a smartphone app or webpage (https://plantalert.org/).

Factsheets and information

As part of the work for the NNSS, the BSBI, BTO and MBA have collated information on c. 3,700 non-native British taxa across a range of taxonomic groups (c. 1,800 plants) (Roy *et al*., 2014b). This 'species register' provides up-to-date information on environment, native range, habitats, invasion pathway, impact, year and place of first record, as well as up-to-date hectad distribution maps, and is openly available online via the Non-Native Species Information Portal (NNSIP). BSBI experts have also produced detailed factsheets for around 100 of the most invasive non-native plants, which also provide assessments of the most effective methods for control and eradication. In addition, more detailed 'risk assessments' have been completed for a handful of plant species by BSBI experts, e.g. *Orontium aquaticum* (Golden-club) and *Sarracenia purpurea* (Purple Pitcherplant) (www.nonnativespecies.org/index.cfm?pageid=143).

Conclusions

The results of the BSBI's Threatened Plants Projects showed that the intensification of land management remains the primary threat to our wild flora, with pollution, abandonment and climate change adding significant pressures to already depleted populations (Walker *et al*., 2017). Invasive non-natives had much more localised impacts, mainly in wetland habitats where they are easily dispersed. That said, invasive non-natives cannot be ignored and, as I hope this note has shown, the BSBI is making a significant contribution to our understanding of which species pose the greatest threats, as well as providing some much-needed evidence to target their control.

Acknowledgements

I would like to thank Katharina Dehnen-Schmutz, Oli Pescott, Helen Roy and Olaf Booy for comments on a draft of the article.

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The impact of native and alien 'thugs' in semi-natural habitats

DAVID PEARMAN, WITH CONTRIBUTIONS FROM IAN BENNALLICK & BRYAN EDWARDS

In 2004 in *BSBI News* I expressed scepticism over the prevailing view that alien plants are one of the main threats to our native flora, and instead postulated that some native plants were a far bigger menace (Pearman, 2004). This has been taken up to some extent by others (e.g. Thomas & Palmer, 2015; Thompson, 2014), some using my half-jocular word 'thugs'. I, too, have tried to develop this with articles, either with Kevin Walker or inspired by him (e.g. Pearman & Walker, 2009).

In very simple terms my line has been that our native flora has evolved over very many centuries of management, particularly livestock grazing, and in the last half-century or more that management has changed (e.g. cattle for sheep, hedges flailed rather than cut, road verges cut annually rather than grazed, and much more intensive farming in fertile areas) or has relaxed, leading to scrub invasion, or even abandonment (e.g. of coppicing). This has been accompanied by a vast increase in nutrient loadings from a variety of human sources, for example, from vehicle traffic, agricultural fertilisers, dairy farming, etc. Of all these, possibly scrub invasion is the most serious.

Formerly species-rich chalk grassland at Hambledon Hill, Dorset, now dominated by *Brachypodium rupestre*. *Andrew Branson*

That aliens are a major threat to our native plants is put forward by a host of conservation organisations and by the Government-funded, Non-Native Species Secretariat. But, as far as I can ascertain, this is often based upon local sightings and on the fact that it is often easier to see the effect of newly arrived alien species coming into a site, than to judge the spread of native plants, which have always been in the landscape.

The effect of invasive native species

There have been few exercises that tested the real

effect of native plants on other natives. A decade ago, Plantlife circulated Vice-county Recorders in Wales asking for instances of threats from aliens on Sites of Special Scientific Interest (SSSIs), and these turned out to be very few indeed. But, the recent BSBI survey and subsequent publication, *Threatened plants in Britain and Ireland* (Walker *et al*., 2017), stated (p. 13) that 'Invasive species were noted as a threat on many sites … [with] native species *thirteen times* [my italics] more likely to have been listed as a threat than non-natives, despite widespread concerns over the impact of invasive non-natives on native plant diversity'. More than this, in the ranking order of threats to the sites and the rare plants therein, invasive aliens were the second to bottom threat.

The last, DEFRA funded, *Countryside Survey* found 'The plant species that increased in frequency the most in all plot types in Great Britain between 1998 and 2007 are typically those plants which are taller when mature (e.g. trees are taller than grasses) … Later successional species such as trees and shrubs have increased at the expense of early successional species … Plant species that can benefit from a reduced intensity of habitat management have become more prevalent. Climbing species and species that have a more westerly distribution (e.g. *Rubus fruticosus* agg. (Bramble)) have also increased. The number of non-native or 'alien' plant species recorded in Great Britain has increased greatly in the past sixty years. Most non-native species remain relatively scarce in the CS sampling plots (over 14,000 plots in this analysis), although locally they can be very abundant e.g. *Rhododendron ponticum* (Rhododendron) and *Fallopia* [*Reynoutria*] *japonica* (Japanese Knotweed). Together, non-native species now account for nearly 2% of the vegetation cover of the British countryside' (CS_UK_ Results 2007).

An increasing focus on non-natives

One major point of interest concerns the number of alien species. This might well be looked at in the light of the aids to identify them. There has been a truly astonishing growth in alien plant recording in the last 30 years, and in my view this is very largely

Rubus fruticosus agg. encroaching on a former cattle-poached area, with *Sibthorpia europaea* (Cornish Moneywort), East Coombe, Cornwall. *Ian Bennallick*

due the enhanced ability to recognise them. To illustrate this, the last edition of Clapham, Tutin & Moore (1987) contained 450 fully-keyed alien species, excluding archaeophytes (plus 207 un-keyed); Clive Stace's 1997 flora included 1,387 fully-keyed alien species, again excluding archaeophytes (plus an unknown number of un-keyed), together with many illustrations of key features. With his 2010 & 2019 editions that total covered has increased to nearly 1,700 alien species, making a nearly fourfold increase since the 1987 Flora. There is no doubt that the presence of a species in a keyed Flora leads to better recording, and this has contributed to the consequent truly dramatic increase in people both able and willing to record aliens and has, if anything, fuelled the perception that we are being over-run by them.

Teasing out the real story

Other than the examples given above, to my knowledge, nobody has tried to conduct a detailed survey on these impacts. When I was chairman of BSBI's Records Committee I drafted a circular to Vice-county Recorders along the lines below, but not only could I not quite find the right parameters – perhaps because too much is subjective – but then other priorities, such as Atlas 2020 intervened. Yet, like many members, I'm outside in the countryside several times a week, and am constantly struck by the contrast between the very frequent swamping of native vegetation by other more aggressive natives, and the relatively localised impact of alien plants, perhaps with the exception of *Rhododendron ponticum*. I appreciate that this, in its turn, is a generalisation, but note the key word here, 'localised', one might add 'visible', too, as so many alien plants occur near habitations and developments. Take the classic story of our native *Hyacinthoides non-scripta* (Bluebell) and the garden hybrid, *H.* × *massartiana*. We see the latter everywhere, in semi-urban habitats, and its presence spawned a whole series of scare stories – I remember the campaign by one conservation organisation: 'Death-knell to bluebells'. Yet all subsequent research led by Royal Botanic Garden Edinburgh seems to indicate that the threat is minor – see the RHS *Garden* magazine for July 2019.

Former field edge in Cornwall now covered in *Clematis vitalba* (Traveller's-joy). *Ian Bennallick*

I wanted Vice-county Recorders to make me three lists and asked them to assemble:

- The ten most invasive native plants in your VC, and *why* you consider they are impinging on semi-natural vegetation, especially that which you value – that is 'nice' habitat that has potential for 'nice' plants. We want to know what species are altering the composition of these communities, often making them less species-rich and more homogeneous. We would like you to exclude species that are just having a very local impact, even if that looks bad. It might be difficult and too subjective to list in order of worst threats, but have a try by all means.
- The ten most invasive alien plants that are having a similar effect – that is, altering the composition of the flora. So that would exclude isolated threats such as the localised spread of clonal species that are largely confined to ruderal habitats. The list could include plants that are native elsewhere in Britain and Ireland, but alien in your patch (such as *Ulex europaeus* (Gorse) on Rum and Coll).
- **Most important** – a combined top ten regardless of whether alien or native.

Some initial results

With Ian Bennallick in Cornwall and Bryan Edwards in Dorset, I have tried to produce such lists, as shown below. They raise interesting points that I have alluded to above. We had to keep reminding ourselves that we were seeking the plants that posed a threat to the native habitats and vegetation that we valued. But, to illustrate the difficulties, both Bryan and Ian know their counties far better than I do, and I might have produced the same candidates in a different order!

Cornwall invasive species

Cornwall natives

1. *Ulex europaeus* (Gorse). Heathland, acid grassland. Sets seed easily and quickly spreads with relaxation of grazing.
2. *Pteridium aquilinum* (Bracken). Heathland, acid grassland. Spreads quickly when grazing relaxed and very labour intensive to eradicate.
3. *Hedera hibernica* (Ivy). Woodlands, coast. Threat to lower plants in woodland and coastal slopes and higher plants where shading favours it. Increasing owing to a lack of management and favoured by shade and climate change.
4. *Rubus fruticosus* agg. (Bramble). Ruderal, woods and grasslands. Increasing everywhere and very quickly invading disturbed sites.
5. *Salix cinerea* ssp. *oleifolia* (Grey Willow). Quickly dominating unmanaged valley bottoms to the exclusion of almost all other plants.
6. *Prunus spinosa* (Blackthorn). Spreading by suckers from hedges and quickly dominating fields.
7. *Molinia caerulea* (Purple Moor-grass). Dominant in under-grazed mires and heaths.
8. *Betula pubescens* (Downy Birch). Heaths, woodlands. An early-invading pioneer species, especially on wet heaths.
9. *Dactylis glomerata* (Cock's-foot). Grasslands and ruderal habitats, encouraged by lack of management and high nutrients.
10. *Clematis vitalba* (Traveller's-joy). Ruderal and woodland habitats. It is now spreading very quickly and dominating hedgerows and dune systems.

Cornwall aliens

1. *Rhododendron* × *superponticum* (Rhododendron) A persistent and dominant species; despite much effort in clearance, it is invading heathlands on Tresco and elsewhere.
2. *Crassula helmsii* (New Zealand Pygmyweed). Any aquatic habitat, quickly smothering ponds and smaller waterbodies, and forming dense fringes around reservoirs.
3. *Prunus laurocerasus* (Cherry Laurel). A problem in many woodlands, casting a dense shade and spreading.
4. *Cotoneaster* spp. Dunes and ruderal habitats.
5. *Acer pseudoplatanus* (Sycamore). Woodland and coasts. Quickly invades unmanaged habitats, and is now the dominant tree in almost all secondary woodland.
6. *Reynoutria japonica* (Japanese Knotweed). Ruderal

and coastal. Formerly dominating many coastal valleys as well as roadsides. It has been subject to a huge council-funded programme of eradication.

7 *Impatiens glandulifera* (Indian Balsam). Aquatic and woodland habitats. It sets prolific seed, and, although it is largely replacing other coarse species, it can invade grasslands.

8 *Crocosmia* × *crocosmiiflora* (Montbretia). Ruderal and occasionally heathland, quickly forming large clumps.

9 *Hippophae rhamnoides* (Sea-buckthorn). Dunes and dune grassland. Quickly spreading and difficult to eradicate.

10 *Carpobrotus edulis / Disphyma crassifolium* (Hottentot-fig / Purple Dewplant). A serious but relatively local dominant of cliffs. However, if cleared without subsequent management, it is quickly replaced by *Ulex, Rubus* or *Prunus.*

Cornwall combined

1 *Ulex europaeus*
2 *Pteridium aquilinum*
3 *Hedera hibernica*
4 *Rubus fruticosus* agg.
5 *Salix cinerea* ssp. *oleifolia*
6 *Prunus spinosa*
7 *Molinia caerulea*
8 *Rhododendron* × *superponticum*
9 *Crassula helmsii*
10 *Prunus laurocerasus*

Dorset Invading species

Dorset native

1 *Pteridium aquilinum.* Heathland, acid grassland.

2 *Ulex europaeus.* Heathland, acid grassland, calcareous grassland. Even after many £10,000s have been spent on control, it is still increasing.

3 *Hedera helix.* Threat to lower plants in woodland and coastal slopes and higher plants where shading favours it. Increasing owing to lack of management and favoured by shade and climate change.

4 *Rubus fruticosus* agg. Increasing along road verges.

5 *Molinia caerulea.* Dominant in damaged mires over large areas of the Poole Basin. Favoured by disturbance such as drainage and fire.

6 *Anthriscus sylvestris* (Cow Parsley) / *Arrhenatherum elatius* (False Oat-grass) /*Dactylis glomerata/Heracleum sphondylium* (Hogweed). Abundant and increasing along road verges through lack of management and nutrient enrichment.

7 *Ilex aquifolium.* Ancient woodland; shading effects particularly on lower plants. Increasing, in spite of high deer numbers, owing to lack of management and favoured by shade and climate change.

8 *Prunus spinosa.* Invading under-managed grasslands and road verges.

9 *Brachypodium rupestre* (Tor-grass)/ *Bromopsis erecta* (Upright Brome). Both increasing owing to lighter grazing.

10 *Carex acutiformis* (Lesser Pond-sedge) & *C. riparia* (Greater Pond-sedge). Swamp vegetation dominated by one or both of these have replaced other tall-herb / fen vegetation in Dorset river valleys

Dorset aliens

1 *Rhododendron ponticum.* Now been successfully treated and eradicated from many heathland sites, but still a persistent problem in some woodlands.

2 *Campylopus introflexus.* A moss now abundant on bare peat and acid soil on heathlands especially after fires. Impacts not fully investigated.

3 *Crassula helmsii.* Rapidly increasing now into Little Sea and floristically important ditches and ponds.

4 *Impatiens glandulifera.* Now abundant along many water courses and spreading outside of wetland habitats.

5 *Acer pseudoplatanus.* Invading all woodlands, even those of *Fraxinus excelsior* (Ash).

6 *Prunus laurocerasus.* A problem in many woodlands.

7 *Petasites pyrenaicus* (Winter Heliotrope). Increasing along road verges, where spread by flailing.

8 *Cotoneaster integrifolius* (and small-leaved species). Threatening calcareous grassland notably on Portland, but also Melbury Hill.

9 *Lamiastrum galeobdolon* ssp. *argentatum.* Increasing garden throw-out threatening ancient hedgebanks and woodlands.

10 *Symphoricarpos* spp. (Snowberry). Naturalised in

Ulex europaeus and *Pteridium aquilinum* on former unimproved grassland, Cornwall. *Ian Bennallick*

many woodlands where originally planted for Pheasant cover.

Dorset Combined

1 *Pteridium aquilinum*
2 *Ulex europaeus*
3 *Hedera helix*
4 *Molinia caerulea*
5 *Rubus fruticosus*
6 *Rhododendron ponticum*
7 *Campylopus introflexus*
8 *Acer pseudoplatanus*
9 *Petasites pyrenaicus*
10 *Crassula helmsii*

Discussion

To us the results are very interesting, though we would be the first to admit that our views, in the absence of detailed surveys based on agreed methodology, must be subjective. Yet the results are so clear that we feel that they must have value. Note that native species fill the first half of both combined tables, yet, of course, we would be the first to agree that aliens can make a bad situation worse. The point we wish to make is that they are only a really small part of the equation – BSBI Recorders have recently been asked to assess the impact of the worst aliens, but we are convinced that this is asking only half of the question.

We appreciate that we have selected two southern counties, although, as I have said above, I feel the problems are most acute in the lowlands. I would be very interested in the views of other field botanists. Other botanists that I have discussed this with suggest other invasives, such as *Oenanthe crocata* (Hemlock Water-dropwort) *Phragmites communis* (Common Reed), etc. Fine, but you will notice that those are native species, too.

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Comment: Mind the gap

CAROL WILSON

Jim White introducing members of the public to wild flowers in a Dorset reserve, as part of a series of wild flower walks.

As recording for Atlas 2020 comes to an end, many people have been asking 'What next?' Of course, there are those who will always want to continue with recording and in some sensitive areas this will remain essential, but now is an opportunity to turn our minds to other things. Once the square bashing is behind us, I suggest that the BSBI begins to reconsider the need to teach others and to find creative ways in which to do so.

Now I know that many will object and say 'But we always welcome newcomers', 'We are always willing to help others to identify wild plants', but I think that the need is greater than that now. We need to become more proactive in the move to ensure that the next generation engages with the natural (especially the floral) world.

A century ago it was commonplace to be able to name the wild flowers where people were living. To take just a small handful of examples: the *Frampton Flora* compiled by the Clifford family in Gloucestershire records many of the plants of the area (Mabey, 1985); the delightful watercolour paintings of the Rev. Henry Terry illustrated the wild flowers of his parish in order to help his children to learn their names (1978); the work of Edith Holden in her *Country Diary of an Edwardian Lady* (1982) is, of course, legendary, and before taking up her nursing career, Edith Cavell recorded over 200 species on Swardeston Common in her native Norfolk (Bennett, 1995). How many could do that now?

Until relatively recently, botany was a component of every child's education. It was a given that primary school teachers had a knowledge of their local flora and a science teacher at secondary level was expected to be able to impart detailed information on the structure and forms of plants, as well as naming them. Some, such as Esther Kirkwood, shared that knowledge for the use of others. Kirkwood's drawings (1931) show an in-depth awareness of botanical structure and plant identification and give an indication of what was taught at the time.

Plant blindness

In schools today, there is relatively little in the way of plant science, let alone plant identification. Even at university level, as far as I am aware, there is no course in the UK offering an element of plant ID. Recent research, cited in the Wild Flower Society magazine, has shown that 86% of A-level biology students in the UK could only identify three or fewer wildflower species and 83% of adults could not identify an Ash tree. This is now known by the tragic

term, 'plant blindness'. In a similar vein, the Oxford Junior Dictionary, self-limited in its number of words, has removed 'catkin' and 'acorn' in order to include words considered to be more relevant such as (believe it or not) 'celebrity'.

Moreover, alongside this dearth of knowledge about our plants has come a significant rise in the number of mental health problems, not least among children and young people. It is well known and generally recognised – if not always acted upon – that engaging with nature helps one's mental health. Identifying wild flowers can and should become part and parcel of any engagement with the natural world. The onus lies with those who know to help others to take notice of their floral environment, to learn to name the wild flowers around them and benefit from the pleasure of doing so.

Among the members of the BSBI there is a wealth of collective knowledge. Unfortunately, as cited above, there is now an increasing gap, amounting to a yawning chasm, between what is known by members of the BSBI and what is known by the average person in the street, or even on a country walk. Just as travellers alighting from a train at certain stations are advised, so we need to 'mind the gap'.

Closing the gap is becoming of paramount importance before we end up with a closeted few, who hold all the information, and a more or less completely unaware general public, with all of the attendant risks to our wild flowers. Writer Robert Macfarlane puts it succinctly: we will not save what we do not love and we rarely love what we cannot name. Naming one's local flora needs to become part and parcel of everyday life once again, which means that the information about our plants needs to be made eminently accessible. That means, in the first instance, setting aside Latin names, which can be off-putting to many beginners, and helping people to learn the English names of at least common wild plants.

A helping hand

Important though tetrad recording is, isn't it time to think 'outside the box'? Plants can be recorded within a parish or woodland, a park, a dale or along a riverside walk. Recorded in such a way makes the information much more accessible to those without a botanical background or an appreciation of what tetrad recording means. While tetrad recording will always have its place and continue to be important, recording within a commonly recognisable area makes much more sense to most people. The work of Nan Skyes (2017, 2018) in North-east Yorkshire (v.c.62) has led the way in this with books and leaflets of wild flower walks compiled by colour, rather than botanical order, and using English names rather than Latin, to help walkers to identify wild plants. Nan is a knowledgeable botanist and has proven that botanical accuracy does not have to be sacrificed for the sake of accessibility. Similarly, the plants to be found in the grounds of Jervaulx Abbey have been listed, although sadly not illustrated, for visitors. I am sure that there are similar examples in other parts of the country, but they would seem to be few and far between.

As 'plant blindness' becomes endemic, and it seems that we no longer have a teaching profession able to impart botanical knowledge, perhaps it is time for BSBI members to be proactively filling the void. While Atlas 2020 will map the plants of this country, we also need to make this information available in an accessible, digestible form to encourage others to take an interest in and learn about their local flora.

I am very grateful to Gill Smith for comments on early drafts of this article.

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Banking the UK's seeds – the Millennium Seed Bank's UK Flora Project (2015–2019)

JENNIFER PEACH

The Millennium Seed Bank (MSB) is the most species-diverse wild seed bank in the world. Based at Wakehurst (Royal Botanic Gardens, Kew's 200ha site in Sussex), the bank is home to more than 90,000 collections, representing over 40,000 species from 190 countries around the world – a total of almost 2.3 billion seeds.

Conservation of the UK's native flora is one of the top priorities for the MSB. The UK programme of work is based around three projects, bringing seed into and out of the bank. High quality and genetically representative seed collections are made by the UK Flora Project and the UK Native Tree Seed Project. The UK Native Seed Hub Project promotes the use of those collections by providing seeds, plants and technical advice to support conservation in the UK.

The UK Flora Project

The UK Flora Project (funded by Esmée Fairbairn Foundation) has spent the last four years working towards collecting 98% of the UK's native 'bankable' flora and increasing collections of poorly represented species conserved in the MSB, with a focus on threatened species. The project did not have to start from scratch in 2015, as, despite the name, seeds have been stored in the MSB since the 1970s, with the UK flora being a focus from 1997 onwards. So just over 94% of native species were already conserved when the current project began.

Project co-ordinator Stephanie Miles collecting *Ericaulon aquaticum* (Pipewort) in Scotland in 2018. *Jennifer Peach*

A 'bankable' seed – an orthodox seed – is one which can be dried sufficiently to be frozen without cell damage. Globally, approximately 90% of seeds are orthodox and for the UK the figure is around 99%. The seed bank operates on the principle that drying seed to 15% relative humidity (something like the air humidity at the end of a long-haul flight) and then freezing them at -20°C can hugely extend the lifespan of a seed, meaning that seed longevity is increased by tens if not hundreds or even thousands of years.

With partner organisations, the BSBI and the Royal Botanic Garden Edinburgh, and with specialist input from Tim Rich (hawkweeds and dandelions) and Richard Lansdown (aquatic species), the UK Flora Project has now been successful in conserving 98% of the UK's 1,282 bankable native species.

Collecting the seed

As you can imagine, of the 1,102 collections made over the last four years, not all have been straightforward! From snorkelling in Scottish lochs, looking for dandelions in the dark or scaling sea cliffs in Wales – our staff, partners and volunteers have shown incredible dedication, skill and stamina to conserve these plants. BSBI Scotland Officer, Jim McIntosh, may win the prize for dedication for his 22.5-mile hike in search for *Phyllodoce caerulea* (Blue Heath), only to find that he needed to return a few weeks later to ensure the seed was at the optimum maturity for collection!

At the start of the project, our initial list of species 'missing' from the bank was a mix of shy seeders, such as *Hydrocharis morsus-ranae* (Frogbit), and plants growing in challenging or remote locations, such as *Potamogeton epihydrus* (Ribbon-leaved Pondweed). Some were endemics, such as *Epipactis sancta* (Lindisfarne Helleborine), and some, such as *Najas marina* (Holly-leaved Naiad), had challenging storage requirements which required further research to ensure the longevity of the collection in storage.

Richard Lansdown collecting *Ceratophyllum submersum* (Soft Horwort) in Lincolnshire. *Jennifer Peach*

Storing the seed

You may think that the hard work is over once the seed collections reach the MSB, but once here the seeds are processed: dried, cleaned, x-rayed for quality assessment, counted (not every seed but an estimation based on counted samples) and, finally, bottled and banked.

Some collections require extra attention. The dust-like seeds of an orchid, for example, need to be processed quickly (within two weeks) owing to their potentially short lifespan in ambient conditions. A collection of any seed which is thought to be relatively short-lived (i.e. longevity could be tens rather than hundreds of years) is then split between conventional storage at -20°C and cryo-storage in liquid nitrogen vapour at approximately -197°C, which we expect will extend the lifespan of these seeds in storage. We are collating evidence for this technique by monitoring these collections over time.

Once the seeds are safely stored, there is another important step which will continue for the collection's life in the bank – germination testing. We test a sample from each collection at least every ten years. As long as we know the specific requirements, a germination test provides a gold-standard viability assessment for the collection – a seed which has germinated is surely alive. The process of creating a protocol also provides us with knowledge of how to convert the seeds into plants. Therefore, this process not only provides a long-term assessment of the health of a collection, but the knowledge of how the collections can be used adds a huge amount of value.

Working with wild seeds is not necessarily straightforward, however, and an experimental process to find the optimum conditions for germination is required. Over the last three years we have been trying to better understand the requirements for germination and storage of some of the more challenging species in the British flora, such as orchids and aquatics. From *Anacamptis pyramidalis* (Pyramidal Orchid) to *Spiranthes spiralis (*Autumn Lady's-tresses), we have had great success with orchid germination and have developed protocols for over half of the UK species. In terms of aquatics, we have been able to confirm the majority of species can happily be dried and therefore banked with no detrimental effects.

A valued resource

But why put so much effort into collecting every species? We were asked this question during the

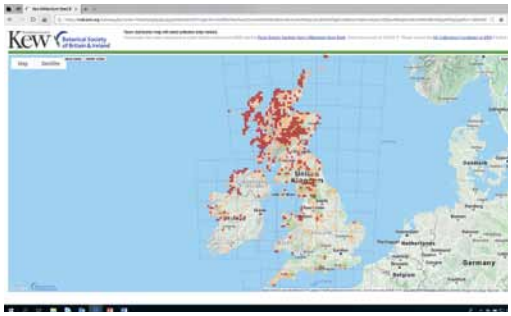

Figure 1 Our online mapping tool was created in collaboration with BSBI: https://msb.bsbi.org. Individual seed collection points can be viewed layered over species occurrence records.

publicity surrounding Tim Rich's rediscovery of the previously thought to be extinct *Hieracium subprasinifolium* (Leek-coloured Hawkweed), a plant which could be mistaken by many gardeners for a common weed.

Firstly, we believe these collections are valuable in their own right, but together, as a snapshot of our current UK native flora, they are even more so. In a world threatened with environmental change, all species can be considered worthy of conservation. If a species is lost, we lose the opportunity to understand its traits – we have also lost its use and potential. We may not fully understand the implications for ecosystem health, for example, or for crop related research, disease prevention or medicinal properties.

Secondly, our collections are available for use. Whether for research, restoration or conservation projects, samples of our collections can be requested, making a valuable resource both now and for the future. Access to seed and associated technical expertise is provided by the UK Native Seed Hub Project which, between 2012 and 2018, provided plant materials, technical assistance or advice to over 50 conservation projects and organisations, including Natural England, the National Trust, the South Downs National Park and Toyota Manufacturing UK.

Finally, but importantly, are the data we hold. We create detailed location, habitat and population data in the field, and the curation procedure records every aspect of the banking process, including any work on germination and propagation. This information is all available for general use on request. An example of data in use is the mapping tool we have created with the BSBI (Fig. 1) which displays our seed collections over species distribution maps. This is useful for gap analysis and prioritising future collections, and also for communicating the extent of our collections to potential users.

Collections in use – *Ranunculus ophioglossifolius* (Adder's-tongue Spearwort) grown from seed and ready for reintroduction. *Jennifer Peach*

Further work

We are currently seeking funding to continue our work, focusing on collecting from multiple populations of threatened species, with the aim of capturing genetic diversity between locations. We want to refine our storage and germination protocols for challenging species and perhaps even working towards collecting that elusive last 2%.

A big thank you to all at BSBI who have supported this project. Your assistance has enabled us to create an invaluable resource which will be looked after for many years to come. Follow our progress on Twitter: @Kew_MSBUK.

The UK Flora project was funded by Esmée Fairbairn Foundation

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Overlooked archaeophytes in the Scottish flora – case studies from the Scottish Borders

MICHAEL BRAITHWAITE

Linaria vulgaris. Andrew Branson

The concept of archaeophytes as a status category for plants introduced by man's activities before 1500 AD was successfully adopted in BSBI's *New Atlas of the British and Irish Flora* (2002). The concept helped readers wishing to think about the continual changes in our flora over the centuries in response to climate change and human activities. My field experience suggests that some species are still spreading north as a slow response to the end of the last Ice Age, let alone more recent changes. *Lysimachia vulgaris* (Yellow Loosestrife) and *Glyceria maxima* (Reed Sweet-grass) only colonised the River Tweed about a century ago and, while man may well have had a hand in their arrival, they must surely have been ready to colonise north by other means. So, unless there is clear literature evidence, there is bound to be a degree of uncertainty in attributing the arrival of a species in an area to man's activities. In particular, forest clearance by man that had become extensive by 2000 BC (although it had started earlier) opened up habitats for colonisation by a range of species not directly related to the agriculture that followed the clearance. Might not familiar species like *Carduus crispus* (Welted Thistle) and *Geranium pratense* (Meadow Crane's-bill) have only reached Scotland at about this time?

The study of changes in plant distribution is greatly aided if closely localised records of a species are available over a long time-span. I have chosen three species as case studies for which I have recorded suitable data for Berwickshire over many years: *Hypericum perforatum* (Perforate St John's-wort), *Linaria vulgaris* (Common Toadflax) and *Tanacetum vulgare* (Tansy). I extend my discussion to other parts of the Scottish Borders, but only make general remarks relating to their distribution in the rest of Scotland.

The coming of the railway brought a continuous strip of a new habitat, railway ballast, which was quickly colonised by a distinctive suite of species. Some were undisputed natives, such as *Equisetum arvense* (Field Horsetail) and *Tussilago farfara* (Colt's-foot), others were neophytes, such as *Chaenorhinum minus* (Small Toadflax) and *Senecio squalidus* (Oxford Ragwort), while a few have a more ambiguous status, especially *Convolvulus arvensis* (Field Bindweed), *Hypericum perforatum* and *Linaria vulgaris*. A few years ago, I argued that *C. arvensis* is an archaeophyte in Scotland (Braithwaite, 2014), but what is the status of the other two?

Hypericum perforatum

Hypericum perforatum has a long history as a medicinal

plant and, indeed, it is still in use today. There is every reason to believe that it was cultivated from early times in monastery herb gardens and at many more humble dwellings. The current distribution of this species in the Scottish Borders shows a fairly modest scatter of records associated with habitation, and frequent records on the banks of the River Tweed and the Whiteadder Water downstream of such habitation. There is no evidence of an association with native grassland away from the rivers that might indicate native status. This is fully consistent with introduction by man followed by seeds being dispersed by river floods. A second phase in its history came with its colonisation of railway ballast and this is clearly reflected in the current distribution. There has been some colonisation of other artificial habitats, but surprisingly little.

It seems churlish to discuss *H. perforatum* without mention of *H. maculatum* (Imperforate St John's-wort) which is considered native in Roxburghshire but only a rare casual in Berwickshire. Their hybrid, *H.* × *desetangsii (H. maculatum* × *H. perforatum)*, is largely confined to the banks of the Rivers Teviot and Tweed, where it is frequent. The Waverley Line railway passed localities for *H. maculatum* at Hawick (NT4913) and Stobs (NT5009) by the Slitrig Water and also where it crossed the Ale Water at Belses Mill (NT5826). At all these localities *H. maculatum* was present at the woodland edge, especially on scaurs (unstable slopes) adjacent to and above a watercourse. In each locality *H. perforatum* had colonised the railway ballast and hybridisation with *H. maculatum* occurred, forming a hybrid swarm variously intermediate between the parents. The hybrid may be presumed to have spread from such points of hybridisation all the way down the Tweed river system, where it has proved to have a greater ecological tolerance than its parents, colonising the partly-shaded habitats preferred by *H. maculatum*, as well as the open habitats preferred by *H. perforatum.*

Linaria vulgaris

While the history of *Hypericum perforatum* can be deduced with fair confidence and strongly points to archaeophyte status, it is more difficult to tease out the history of *Linaria vulgaris*. It is a very widespread species in England and generally assumed to be native at least as far north as County Durham. In George Johnston's 1829 *Flora of Berwick-upon-Tweed*, which covered North Northumberland as well as Berwickshire, it is listed as 'borders of fields and gravelly banks, frequent', not inconsistent with native status, while the entry for Northumberland by Nathaniel Winch in his 1805 Flora is similar. In Johnston's second Flora of 1853 he adds 'it appeared in many places, previously unknown to it, in the cuttings made for the railways'. Today, *L. vulgaris* is still frequent in the Scottish Borders on and near the main line railway and along disused branch lines, but with only a small scatter of sites elsewhere.

Linaria vulgaris seems to have been only rarely used as a medicinal herb, although the 1636 edition of John Gerard's *Herbal*, in a rather predictable application of 'the doctrine of signatures', lists as a 'virtue' the use of a decoction of its yellow flowers as a cure for jaundice, with its yellow skin condition. There is intriguing evidence of its former medicinal use in an 1821 record from the ruins of Melrose Abbey (NT5434), where it might well have been grown in a medicinal herb garden. Furthermore, it grows on an eroding rocky bank and a small rocky knowe above the River Tweed at Gaitheugh (NT5934), immediately opposite the site of the old Melrose Abbey, founded in 651 and which was occupied by the monks until its grander replacement was built at Melrose from 1136, so maybe it was cultivated there also and its small, winged seeds were blown across the river.

There are two pre-railway localities for *Linaria vulgaris* in John V. Thompson's *A catalogue of plants growing in the vicinity of Berwick on Tweed* 1807. He records it at New Mills (NT9552), a large corn mill serving Berwick built not long before 1800 by the Whiteadder Water. His other locality is at a turnpike

Linaria vulgaris grows above the River Tweed at Gaitheugh, opposite the old Melrose Abbey. *Iain Lees*

at the English Border (NT9757) on what is now the A1 trunk road just north of Berwick. Both these localities are just the sort of places for casuals arising from seed carried inadvertently by waggons. These records put a different perspective on Johnston's 'borders of fields and gravelly banks'.

Linaria vulgaris grows in very persistent clonal colonies formed vegetatively by adventitious buds produced on its deep roots. A surprising colony by the A6105 over Greenlaw Moor (NT7248) at 220m, which is associated with dumped stony material, has been recorded there in 1963, 1966, 1994 and 2006. The few other recent records away from the railway have also been in disturbed habitats on roadsides, in towns and associated with the old corn mill at Edington Mill (NT8954). None of them is in the least indicative of native status.

I suggest that there is enough evidence here to support my contention that *Linaria vulgaris* is an archaeophyte in the Scottish Borders and, very possibly, in Scotland as a whole, as I have found no contrary evidence in the Floras I have consulted. Indeed, Helen Jackson remarks of the East Lothian records that almost all its sites are beside or within 1.5km of a present or former railway line.

Tanacetum vulgare

Tanacetum vulgare was formerly grown in cottage gardens so that its strong-flavoured leaves and flowers could be used for medicinal and culinary purposes, including a herbal tea. It was often cast out onto road verges and waste ground and readily established to form large patches by stoloniferous growth. It seems seldom or never to be dispersed by seed. It is often held that it is impossible to distinguish between these introductions and any native population. In the case of the Scottish Borders, I would beg to differ. Fine-scale recording demonstrates that, away from the rivers, the very modest numbers of colonies are all discrete patches in just the sort of places where one would expect throw-outs. Although *T. vulgare* is widespread by the River Tweed and some of its tributaries, the pattern is just what would be expected of a plant whose root fragments establish after being dispersed by floods from an initial introduction.

I would thus contend that *T. vulgare* is an archaeophyte in the Scottish Borders and very possibly in Scotland as a whole as, once again, I have found no contrary evidence in the Floras I have consulted, with waste ground being the most commonly mentioned habitat.

Tansy is used in herbal teas today.

In addition to the three species discussed here, there remain other species that might be overlooked archaeophytes, at least in Scotland, and would benefit from further study. I would mention but three: *Lepidium heterophyllum* (Smith's Pepperwort) a scarce plant of artificial habitats and, very locally, of river shingle; *Sagina filicaulis* (Upright Pearlwort) which is virtually restricted to gravelly substrates (but not the similar *Sagina apetala* (Annual Pearlwort) which is a relatively scarce native plant of dry grassland), and *Sonchus oleraceus* (Smooth Sow-thistle), which grows in towns and villages but is seldom found as an arable weed and is not found on the rocky outcrops which are a habitat of the native *S. asper* (Prickly Sow-thistle).

While there will always be a degree of uncertainty in our deductions about the probable history of our flora, this remains a stimulating field for study to which one of the keys is fine-scale records of the species in question.

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Salix euxina (Eastern Crack-willow) naturalised along the River Spey, Scotland

ANDY AMPHLETT

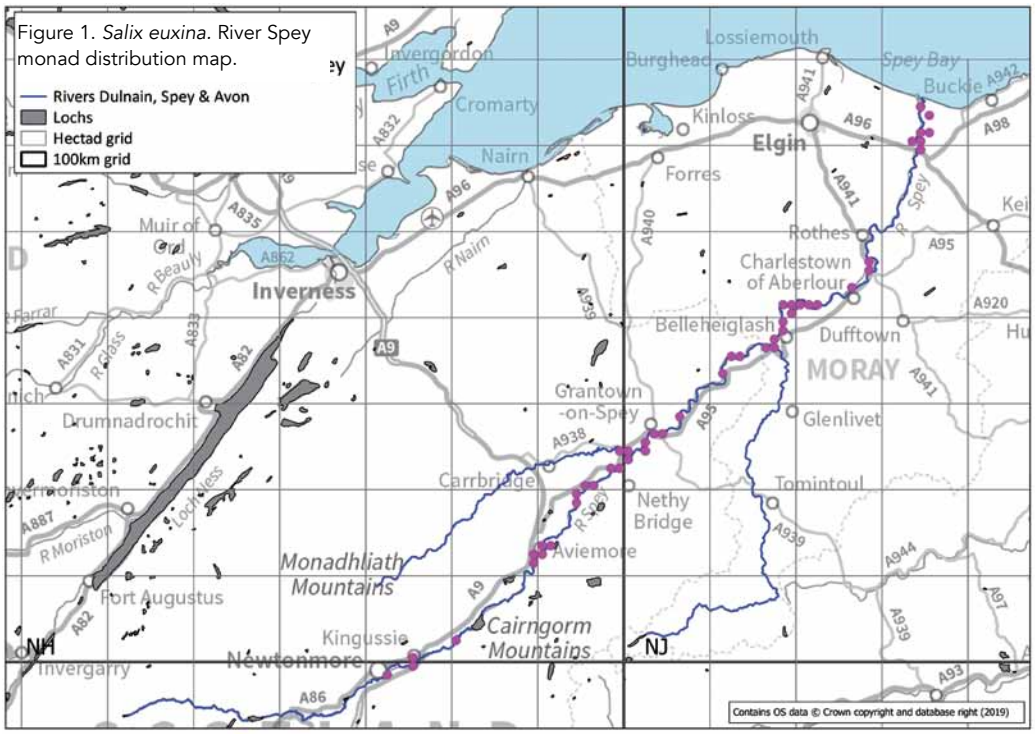
In the BSBI Handbook, *Willows and Poplars*, Meikle included *Salix fragilis* var. *decipiens*, for which he adopted the common name 'White Welsh Willow' (Meikle, 1984). This taxon was included in the first three editions of Stace's Flora (Stace, 1991, 1997, 2010) under the same variety name. In the first reprint of the third edition (October 2011) Stace updated the nomenclature of '*Salix fragilis*' in accordance with Irina Belyaeva's recent *Taxon* paper (Belyaeva, 2009). In this paper, *S. fragilis* var. *decipiens* is synonymised with *S.* × *fragilis* (the hybrid of *S. alba* and the newly named *S. euxina*). However, *S. fragilis* var. *decipiens* as formerly understood by Meikle (and therefore other botanists in this country) was actually *S. euxina*. Confusing!

The striking greenish-yellow of *Salix euxina* trees in flower, early May. *Andy Amphlett*

Meikle's description of his var. *decipiens*, encapsulates several of the key identification features of *S. euxina*: twigs pale ochre-coloured and distinctly lustrous; fresh, unripened shoots often stained crimson; leaves wholly glabrous; only occurring as male plants. Meikle commented that it has 'been noted in most counties, though seldom in quantity, and invariably as an introduction'. Stace (2019) adds that twigs are very brittle at branches, and that the leaves are glabrous from the 1st, and that it is always (?) planted, i.e. not naturalised. Native to Turkey and Transcaucasus, Stace adopted the apt common name: 'Eastern Crack-willow'.

Salix euxina is (at September 2019) recorded from 269 hectads in 71 vice-counties. Because of name changes, there is the possibility that some records are incorrectly listed as this species. Conversely, records show some obvious clumping, which suggests recording bias, with many vice-counties having no records, or only a scatter.

Along the River Spey in north-east Scotland, *S. euxina* was first recorded (in three monads) in 1973 by Mary McCallum Webster (as var. *decipiens*). Between 2015 and 2018, targeted searches by the author and Ian Green recorded *S. euxina* in 42 monads along this river, including in the three monads recorded in 1973,



Salix euxina (left), showing crimson-flushed young shoots and small male catkins. *Salix* x *fragilis* var. *furcata* (right), showing green young shoots and large male catkins, lower left catkin showing characteristic forking. *Andy Amphlett*

and in five monads along immediately adjoining burns and rivers (Fig. 1). In early to mid-May, *en masse*, the male catkins are a striking greenish-yellow; the largest trees, for example, near Aviemore (NH8912, v.c.95), looking like billowing clouds beside the river. Along the River Spey, *S. euxina* is

sometimes found alongside *Salix* × *fragilis* var. *furcata*, another very eye-catching willow when the male catkins are in flower.

Mary McCallum Webster, in her Flora (1978), described it as 'frequently planted'. However, she cited only five records, and two of these were from shingle beside the River Spey where they were unlikely to have been planted. The majority of *S. euxina* specimens beside the Spey are growing within the spate zone. While it is impossible to judge if the old, large trees were planted, numerous examples were noted where young bushes and small trees were growing in sand and amongst boulders at the river edge. *Salix euxina* is well-adapted to vegetative reproduction downstream. Twigs are very fragile at their junction with the adjoining branch, and after a flood, snapped-off twigs can be found amongst the riverbank flotsam. *Salix euxina* is known only as male plants in this country, so the spread down the Spey must, in large part, be by twigs breaking off and lodging at the water's edge further downstream. The furthest upstream record, near Newtonmore (v.c.96) is of a small bush on shingle (not planted), suggesting that there are more trees to find upstream of that point.

A similar situation occurs along the lower reaches of the River Tay (v.cc.88 & 89). For example, west of Meikleour, Les Tucker noted (in 2017) that *S. euxina* was 'commonly regenerating on shingle beds'.

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Changing status of *Scleranthus annuus* (Annual Knawel) on the Sefton Coast, north Merseyside

JOSHUA STYLES, PHILIP H SMITH, PATRICIA LOCKWOOD & NATALIE HUNT

Scleranthus annuus (Annual Knawel) is a small, annual/biennial herb of open, low-fertility, sandy ground in various habitats, including arable margins, heathlands, quarries and acid grasslands.

It is Red-listed as 'Endangered' in both the UK and England (Lusby, 2002; Stace, 2019; Stroh *et al.*, 2014; Walker *et al.*, 2017). Ellenberg indicator values (Hill *et al.*, 2004) show that this is a light-loving plant (L=8), associated with relatively nutrient-poor (N=4), acid (R=4) and dry soils (F=4). Rodwell (2000) lists *S. annuus* as an associate in two open habitat types (UK National Vegetation Classification OV1 *Viola arvensis-Aphanes microcarpa* community and OV5 *Digitaria ischaemum-Erodium cicutarium* community), while Walker *et al.* (2017) noted that the species was most frequently found during the *Threatened Plants Project* (2008–13) in grazed U1: *Festuca ovina -Agrostis capillaris-Rumex acetosella* grassland.

Since 1930, in England *S. annuus* has shown 67% and 64% declines in area and extent of occurrence, respectively (Stroh *et al.*, 2014). Walker *et al.* (2017) reported that the plant was re-found at only 35% of surveyed historical sites. Before 2019, its only extant locality in v.c.59 (South Lancashire) was at Birkdale Common on the Sefton Coast, north Merseyside, where the plant was rediscovered in 2010, having last been seen in 1914 (Smith, 2011). However, in 2019,

Birkdale Common with *Scleranthus annuus* habitat in foreground, December 2018. *Philip Smith*
Inset *Scleranthus annuus*, Birkdale Common, December 2018. *Joshua Styles*

S. annuus was also found on Freshfield Dune Heath Nature Reserve, about 6km south of the Birkdale locality.

Birkdale Common

Birkdale Common is a 10ha area of amenity grassland on the eastern edge of the Sefton Coast sand-dune system (SD320148). In December 2018, JS observed that the population of *S. annuus*, previously numbering in the low hundreds, had substantially increased. It was therefore thought appropriate to estimate population size, describe the species' habitat and investigate possible reasons for its increase.
A visit on 9th December 2018 found that the Birkdale colony was restricted to the area described by Smith (2011), namely 350m^2 on the west-facing slope of a large sandy mound. Five 2x2m quadrats were recorded using UK National Vegetation Classification methodology (Rodwell, 1992) in representative vegetation supporting *S. annuus*. A small subsurface soil sample was taken from each quadrat, pH being determined using a Lutron PH-212 meter buffered at pH 4 and 7.

To estimate population size, the number of *S. annuus* plants was counted in each quadrat and scaled up to the colony area. This produced a figure of about 15,700 plants. However, because of the great variation in quadrat counts, from 9 to 532 plants per square metre, it was thought best to give an approximate population estimate of 10-20,000 plants.

Nineteen vascular taxa and five bryophytes were identified in the quadrats, the most frequent associates of *S. annuus* being *Agrostis capillaris* (Common Bent), *Aphanes arvensis* (Parsley-piert), *Cerastium* sp. (mouse-ears), *Festuca ovina* (Sheep's-fescue), *Hypochaeris radicata* (Cat's-ear), *Ornithopus perpusillus* (Bird's-foot), *Plantago coronopus* (Buck's-horn Plantain), *P. lanceolata* (Ribwort Plantain) and *Trifolium repens* (White Clover). Numbers of vascular taxa per quadrat ranged from 14 to 17 (mean 15). TABLEFIT analysis (Hill, 2015) of the quadrat data (Table 1) gave 'very poor' statistical fits to U1, four samples having accordance with U1f: *Hypochaeris radicata* sub-community, while one was closer to U1c: *Erodium cicutarium-Teesdalia nudicaulis* sub-community. Soil pH ranged from 5.2 to 6.9 with a mean of 6.0 and median 6.1.

Freshfield Dune Heath firebreak habitat of *Scleranthus annuus*. *Philip Smith*

Freshfield Dune Heath

Acquired in 2004 by the Wildlife Trust for Lancashire, Greater Manchester and North Merseyside, Freshfield Dune Heath Nature Reserve (35ha) (SD294091) was formerly part of an RAF airfield requisitioned from farmland in 1941. Like Birkdale Common, the land is situated on the eastern fringe of the dune system. Having been leached by rainfall for several centuries, its initially calcareous sandy soil, now acidified, supports dune heath, with a mosaic of *Calluna vulgaris* (Heather), *Ulex europaeus* (Gorse) and acid grassland communities (Gateley, 1995). *Scleranthus annuus* was not known to occur on the heath until late June 2019 when PHS and JS found three individuals, a few centimetres apart, on level, open, heavily Rabbit-grazed grassland in a firebreak. Searches in the

Table 1 TABLEFIT analysis of quadrats containing *Scleranthus annuus*.

Site	NVC code	Community	Sub-community	% fit	Match
Birkdale	U1f	*Festuca ovina-Agrostis capillaris-Rumex acetosella*	*Hypochaeris radicata*	25	Very poor
Birkdale	U1f	*Festuca ovina-Agrostis capillaris-Rumex acetosella*	*Hypochaeris radicata*	29	Very poor
Birkdale	U1f	*Festuca ovina-Agrostis capillaris-Rumex acetosella*	*Hypochaeris radicata*	24	Very poor
Birkdale	U1f	*Festuca ovina-Agrostis capillaris-Rumex acetosella*	*Hypochaeris radicata*	29	Very poor
Birkdale	U1c	*Festuca ovina-Agrostis capillaris-Rumex acetosella*	*Erodium cicutarium-Teesdalia nudicaulis*	28	Very poor
Freshfield	U1	*Festuca ovina-Agrostis capillaris-Rumex acetosella*		37	Very poor

immediate vicinity failed to reveal more plants. The habitat, which is occasionally mowed, is summer-grazed by a small herd of rare-breeds sheep and supports a high population of Mottled Grasshopper (*Myrmeleotettix maculatus*). An NVC quadrat with nine vascular taxa was recorded in mid-July 2019, TABLEFIT analysis giving a 37% (very poor) fit to U1. The main associates of *S. annuus* were *Aira praecox* (Early Hair-grass), *Agrostis capillaris*, *Carex arenaria* (Sand Sedge), *Festuca ovina* and *Rumex acetosella* (Sheep's Sorrel). About 35% of bare ground was recorded, the severely droughted sward being only about 1cm tall. Soil pH was 5.0.

Discussion

The size of the Birkdale Common population of *S. annuus* seems to be exceptional nationally, Walker *et al*. (2017) noting that populations of this species recorded for the *Threatened Plants Project* were generally small (median 11–100 plants). Only two of their sites supported thousands, the largest in west Wales having about 40,000 plants. Why numbers at Birkdale suddenly increased by more than an order of magnitude is unclear but the severe summer drought of 2018 may be implicated. Coupled with heavy public pressure, this is likely to have opened up the sward, reducing competition and creating suitable conditions for seed germination. Walker *et al*. (2017) emphasise that disturbance, such as localised erosion on steep banks, seems to be a factor in the occurrence of *S. annuus*. They further state that numbers could fluctuate dramatically in response to climate and that the plant may re-appear after an absence of several years following disturbance. These authors also mention that *S. annuus* was most often found in grazed U1 or in droughted, disturbed vegetation. U1 is associated with base-poor, summer-parched soils, often on sands or fine gravels, in the warm, dry lowlands of southern Britain. Particularly characteristic are diminutive annuals, such as *S. annuus*, that are able to benefit from late growing-season rains. Often, grazing by Rabbits or sheep maintains the character of U1 vegetation, but trampling by visitors also helps to keep the sward low and open so that winter annuals can thrive (Rodwell, 1992). The *Hypochaeris* sub-community is associated with more oceanic conditions in the west, while the *Erodium-Teesdalia* sub-community is largely confined to Breckland and is an anomalous finding for the Birkdale site. Of the 19 vascular taxa recorded in the Birkdale quadrats, five were listed by Walker *et al*. (2017) as the most frequent associates of *S. annuus*, four of these also being recorded in the Freshfield sample.

The open, well-grazed U1 vegetation on acidic sand of the Freshfield site is also suitable for *S. annuus* (Hill *et al*., 2004; Walker *et al*., 2017) but the plant has not been seen previously in what is a well-recorded nature reserve. Being small and easily overlooked, this species may have been present for some time in small quantity. The observers' familiarity with the plant at Birkdale perhaps increased the likelihood of its discovery at Freshfield.

The range of soil pH recorded at Birkdale (5.2-6.9) and at Freshfield (5.0) is consistent with an Ellenberg Reaction Value of 4 for *S. annuus*, indicating adaptation to moderately acid soils (Hill *et al*., 2004). In his survey of Sefton Coast dune heath, Gateley (1995) did not include Birkdale Common, but found a wide range of surface soil pH (3.5–6.8) for the Freshfield site. Samples supporting U1 vegetation were closely grouped around pH 4.1, somewhat lower than the result for the *S. annuus* quadrat.

Management regimes, involving mowing and recreational trampling at Birkdale and grazing by sheep, Rabbits and grasshoppers, with occasional mowing, at Freshfield, seem conducive to the conservation of *S. annuus* populations. It is possible that further searches of suitable habitat at Freshfield in late autumn will discover more plants.

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Alchemilla micro-species found in the north-east of Scotland

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My interest in the genus *Alchemilla* began with the discovery of *Alchemilla glaucescens* (Silky Lady's-mantle) and *Alchemilla acutiloba* (Starry Lady's-mantle) in the Angus glens, in 2008 and 2010 respectively, and both new vice-county records. I made every effort to get as much information as possible on this genus and it appeared to me that the experts were not all in agreement and that there was still a certain amount of naming and renaming going on. I have no desire to add to the confusion, but between 2010 and 2014 the late Patrick Gaff and I were finding plants in Angus and bordering parts of Perthshire and Aberdeenshire that did not fit with the descriptions of known British micro-species.

It would appear that *Alchemilla* has been a rather neglected genus in a British context and the following is a brief account of two of the over-looked micro-species we found. As yet these are undetermined, but we gave them working names for ease of reference.

In the lowlands and glens we found plants which bore a strong resemblance to plants found in Scandinavia, but differed on a key characteristic. We were not alone in our observations as research demonstrated how easy it is for information to get side-lined. It turned out that one of our finds, a robust plant relatively abundant in grassy verges and river banks at lower altitudes, was first recorded by Balgavies Loch, in Angus, in 1947 by A.H.G. Alston and in the 1950s by Ursula Duncan. Herbarium sheets from the 1950s were labelled *Alchemilla obtusa* which has been subsumed into *A. glabra* (Smooth Lady's-mantle) in recent floras. These plants do not match with descriptions for *A. obtusa*, either the Scandinavian or central European versions. They are very close to *A. baltica* in many respects, including their habitat requirements and ability to withstand periodic mowing. Until fairly recently *A. baltica* was known as *A. nebulosa* owing to the coloration of the upper surface of the rosette leaves as they can be darker in colour around the main veins, giving a mottled appearance.

The plants we were finding did not show this characteristic, but may prove to be a form that has developed to adapt to local conditions. For convenience we referred to this micro-species by the working name of *Alchemilla 'caledonica'* as Caledonia was the Roman name covering that part of Scotland where it grows in abundance. It can be distinguished from *A. glabra* as, in common with *A. wichurae* (Rock Lady's-mantle), it has dense appressed hairs on the petioles, along the full length of the main veins and basal lobes on the underside of the rosette leaves. Rosette leaves have rounded lobes with fairly even teeth and a small to closed basal sinus. Flowering stems have appressed hairs up to the first inflorescence branch.

Alchemilla 'cairnwellensis' as first found on the Cairnwell. *Barbara Hogarth*

A rich source of unusual *Alchemilla* plants can be found on the grassy slopes rising from the parking area by the Glenshee Ski Centre where a species-rich sward has extensive carpets of *Alchemilla* plants. Just a short distance up from the car park on the Cairnwell, we found what we believe to be a micro-species not yet described in the British Isles and it seemed appropriate to give it the working name of *Alchemilla 'cairnwellensis'*.

The key characters of *'A. cairnwellensis'* are the bluish-green, orbicular rosette leaves which are hairless on the upper surface, have a wide angle between the main veins and shallow lobes with large teeth and no incisions between them; the presence of appressed to sub-appressed hairs along the whole length of the main veins on the underside of the rosette leaves; the presence of a dense cover of appressed to sub-appressed hairs along the whole length of the petiole; the presence of a dense cover of appressed to sub-appressed hairs on the lowest two to three internodes of the flowering stems. Plants grown in cultivation have proved to remain true to type for the six years of study.

I have produced a detailed account of *Alchemilla*s found in northern Scotland, entitled '*Alchemilla* – A study of the *Alchemilla* micro-species found in northern Scotland'. It is now available as a paperback on Amazon.

I have also written papers, as yet unpublished, describing *A. 'cairnwellensis'* and *A. 'caledonica'* in detail. These are available from me on request.

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Viscum album (Mistletoe) – with or without hot-spots

JONATHAN BRIGGS

In response to Tim Harrison's interesting article on *Viscum album* (Mistletoe) 'hot-spots' in South Buckinghamshire (v.c.24) in *BSBI News* 141, I thought it would be helpful to reply with a few thoughts about the points raised.

V. album 'hot-spots' are actually a fairly common phenomenon for long-established populations outside of the species' main climatic range in the south-west Midlands area. Within that area it is common throughout, given the right habitats and hosts, but outside of the range it tends to occur only as isolated colonies, ranging from just one plant in a garden to a very visible infestation across many trees in a discrete area. These populations are often centred on parks, gardens and suburbia in general, and have their origins, it can be reasonably supposed, in man-made plantings. Those may have been many decades, or even centuries, earlier and completely undocumented.

Dispersal

One key to understanding these populations is to consider precisely how *Viscum album* spreads. This is done, as Tim writes, by birds, but only a very few birds, as most either do not see the white (i.e. not brightly coloured) berries as food or will not try them more than once, put off by the stickiness of the mucilage. Those that do take them tend to be thrushes, particularly Mistle Thrushes, who swallow them whole and excrete the still sticky seeds *en masse*, and Blackcaps, who swallow only the skin and pulp and carefully wipe individual sticky seeds off their beak onto an object, usually a branch. Tim suggested he thought pigeons were also involved in seed spread, but although I have often seen pigeons grazing *V. album* leaves, I know of no evidence that they eat the berries, or, if they do, whether the seeds survive pigeon gizzards.

A riverside poplar infested with *Viscum album* on the banks of the Severn, near Gloucester. *Jonathan Briggs*

The seeds do not require bark cracks or fissures or branch junctions – that is just gardening lore that is still peddled (in my view somewhat disgracefully!) by many gardening texts. All they need is smooth bark on which to stick, with their natural glue, and penetrate at their own pace. This is exactly what they get from the birds – whether in a sticky thrush dropping or a wiped Blackcap seed. The issue to consider is not the nature of the bark, but how far the birds take the seeds. And the answer is not very far. Thrushes and Blackcaps are territorial feeders and guard their food sources. A thrush gorging in a *V. album* clump will, when it needs to relieve itself, fly a very short distance, usually within the same tree, excrete and return immediately to the *V. album*. A Blackcap similarly will flit a short distance from the *V. album* clump, wipe the individual seed from its beak, and immediately

A female Blackcap feeding on the berries of *Viscum album*. *Jonathan Briggs*

Viscum album seeds germinating and penetrating smooth bark. *Jonathan Briggs*

return to repeat the process. Both can stay doing this for some time. The net effect of this is that seeds are rarely moved more than a few metres and often stay in the same tree. So distance spread is slow.

This means that a small isolated population of *V. album* will take some years to visibly spread, not least because the seedlings take four years or so before they will produce berries themselves. Tree-to-tree spread tends to only happen significantly over decades.

However, once established, other factors do complicate things a little. The growth habit of *V. album* is that each branch bifurcates exactly once each year, doubling the number of branches annually. And each branch terminates in a flower bud – so the number of berries, if pollination is successful, also doubles each year, giving ongoing annual exponential increases in seed numbers. Over a number of years an individual infested tree can produce huge numbers of seeds, creating the intensely infested trees so often seen in apple trees in the plant's core area and, as described by Tim, in parkland *Tilia* (limes). Tree-to-tree spread will increase as well.

Long-established populations can therefore be massive, but confined to a small area. Spread beyond this is helped, of course, by suitable habitats and hosts, such as openly spaced trees. Gardens, parks and suburbia in general, of the type Tim describes, are ideal, and so spread is often much far more successful in these than in the open countryside. The favourite hosts of *V. album* in Britain are cultivated *Malus* (apples), *Tilia* and *Populus* (poplars), particularly the widely planted *Tilia* × *europaea* and *Populus* × *canadensis* (Hybrid Black-poplar) that Tim reports for South Bucks.

Origins of infected trees

It is tempting to suggest that some or all of the obviously long-established parkland populations, particularly on *Tilia*, have their origins in the 18th century when these parklands were laid out. The Hampton Court *V. album* on *Tilia* that Tim mentions has been known since at least the 1790s, although it is not known whether or when it was planted. Tim's speculation that *Tilia* imported from the Low Countries for West Wycombe in the 1760s may have been already pre-infected is intriguing, but I think it more likely that it they would have been infected (a very easy process, so long as you ignore that gardening lore) *after* they had become rather more mature. Trees infected with *V. album* when young are unlikely to grow to be healthy mature trees as it will distort growth and reduce productivity. There are some nurseries today (including, I think, one in the Netherlands) which sell pre-infected *Malus* saplings, but I doubt these will thrive.

Hot spots and not spots

Malus, *Tilia* and *Populus* trees may be the favourite hosts, but in suburbia there may well be many others, often an unusual diversity. And this, despite it having those favourites, suits *V. album* nicely, too. Our *V. album* ssp. *album*, has been recorded on a wider range of hosts than any other mistletoe species worldwide (452 host taxa recorded by Barney *et al.*, 1998). Given the

chance, and a sufficient quantity of seed to be sown, *V. album* will spread to many new hosts. Thus, a long-established population in suburbia may be found on a variety of hosts, sometimes quite exotic ones. In the 1990s BSBI/Plantlife 'national Mistletoe survey' (Briggs, 1999), the most diverse suburban 'hot-spots' were, if I recall correctly, the areas in and around the Oxford and Cambridge Botanic Gardens. They might well beat South Bucks, but they do have an unfair advantage by having many exotics.

Tim's article also referenced 'not-spots' where there is very little *V. album*, despite lots of suitable hosts. These, I would suggest, are simply areas outside the main range and areas where it has not been introduced. Or areas where spread, following an introduction, has not yet begun.

Climate change

Personally-speaking, I am less interested in the diversity of hot-spots and more interested in whether more generally the range and distribution is slowly changing. Climate modelling has long suggested that, with climate change, *V. album* will move east/north-east within mainland Europe and within Britain (Jeffree & Jeffree, 1996). Is this happening? A massive increase, from a few dozen to many thousands, of overwintering Blackcaps in Britain over recent decades must surely be changing how this plant spreads. The Blackcap's habit of wiping each sticky seed on a branch is vastly more efficient than the hit and miss distribution from thrush droppings. Is this having an effect? Several local studies of *V. album* in recent years (some reviewed in Briggs, 2011, 2012) have suggested change – whether the result of climate, bird vector changes or something else entirely – *might* be occurring, but measuring this is inherently difficult. Also, British gardeners have an increasing interest in planting *V. album*. I have personally supplied many of them with seed and guidance, but I doubt that is having much effect (yet). Studies in cities across Europe (e.g. Lodz, Brussels, Hamburg) also discuss change and have relevance to UK suburban populations of *V. album*.

I hope to produce a review of this and other aspects of Britain's *V. album* for *British & Irish Botany* in due course.

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Viscum album near Burnham Beeches, Buckinghamshire

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I read Tim Harrison's article '*Viscum album* hot-spots and not-spots in south Buckinghamshire' (*BSBI News* 141: 19–21) with interest. I live about 10 miles from Tim on the south side of Burnham Beeches. Although there is little *V. album* (Mistletoe) in the Beeches themselves, possibly because the main species growing there are not suitable hosts, the meadows and hedgerows to the south and west contain many trees parasitised by *V. album*.

When BSBI carried out the Mistletoe survey in the early 1990s, I remember recording that, just as today, *V. album* was most common in *Tilia* × *europaea* (Lime). Particular hotspots were/are in the fields north of St Mary's Church, Hitcham, and a couple of miles further north in *Tilia* trees that form the avenue in front of Cliveden House. These trees had grown very tall and about five years ago many were pollarded and a new avenue of young limes was planted parallel to the original avenue. Already some of these young trees have become infected with *V. album*.

The level of infestation varies greatly. Some *Tilia* × *europaea* trees have a single clump of the parasite while others are almost smothered in *V. album*. Older trees often have the swollen distorted limbs that Tim mentions in his article. I have thought that these are where old plants of *V. album* once grew and have died out. I think that I read somewhere that the life span of individual Mistletoe plants is about 30 years.

At the time of the survey I found one small clump of Mistletoe in an *Aesculus hippocastanum (*Horse-chestnut) growing in Burnham and about the same time noticed a similar clump in the *A. hippocastanum* in Eton that Tim mentions. Over the past 30 years, I have watched the progress of *V. album* as it has colonised these two trees. For the first five or so years the single clump slowly grew larger but remained isolated. After five to ten years new tiny plants began to appear, gradually spreading throughout the tree, until after 20 to 25 years the top of both trees has become smothered in the parasite, and the yellowing of the leaves at the top of the crown in summertime is probably due to the stress the heavy infestation is placing on the tree. A successful parasite has to strike a balance in order to survive. If it kills its host it too will die. It will be interesting to see over the next few years whether the heavy infestation of *V. album* kills these two trees or whether it will start to die out so that a more sustainable lower level of infestation is achieved.

Mistletoe has spread into more species. Thirty years ago there was a single plant of *V. album* growing in a *Malus* (apple) in the street where I live. Over the last 10 to 15 years it has spread into other apple trees along the road and also into *Crataegus* (hawthorn) and *Prunus* (plum) cultivars. In other local areas, *Populus* (poplar) has become a common host species over time. Could this rapid increase in *V. album* be a result of milder winters? Continued observation of *V. album* over the next few years will provide interesting information and probably raise as many questions as it will answer – such is the wonder of natural history!

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Mentha pulegium as a pavement weed

ROBIN WALLS

Mentha pulegium growing in a pavement. *Robin Walls*

In July this year, in the margin of the road outside my house, I noticed a small blue flower which proved to be *Mentha pulegium* (Pennyroyal). This is a scarce plant in Britain and the occurrence in Dorset is mainly in the Tertiary soils of the western end of the Hampshire Basin. In its New Forest stronghold it is usually regarded as native, but the New Atlas maps it as alien in the Dorset sites. Nevertheless, it is protected in the UK by Schedule 8 of the Wildlife and Countryside Act because of a severe decline in the populations.

The normal habitat of *M. pulegium* is shallow depressions that are wet in winter, not as a pavement weed 15km from its nearest known site. Seed must have originated from my clothes after collecting seed last year for the Millennium Seed Bank (under license, I hasten to add). Naturally, I have informed the highway authority that they risk committing an offence if they spray the verge and harm the plant. At the time of writing I have not had a reply.

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New Flora of the British Isles, Edition 4 (2019)

CLIVE STACE

The original printing has sold out, but a reprint is now available. In the reprint the opportunity has been taken to make some minor corrections that do not affect pagination. These are all fairly trivial, but the following three are more important:

- The genus ***Dasiphora*** was misspelt as ***Dasyphora*** in two places (but not in the main text)
- It has been discovered that the correct name for ***Festuca brevipila*** R. Tracey is ***F. trachyphylla*** (Hack.) R.P. Murray. Previously the publication by Druce in 1915 of *F. trachyphylla* for a South American species was thought to disqualify that name for our species, but the Murray combination predates Druce; it was published in *Proc. Somersetshire Archaeol. Nat. Hist. Soc.* 41: 418 (1895).
- ***Thujopsis dolabrata*** was misspelt ***dolobrata***.

The corrections are listed on two A4 pages, which are available free of charge, either by email request or by postal request with a sae, from the undersigned.

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A tank track snaking its way across the Salisbury Plain Training Area, near Imber. *Sharon Pilkington*

INTRODUCING MY VICE COUNTY

North and South Wiltshire v.c.7 & v.c.8

Vice-county Recorder: Sharon Pilkington
Co-recorder: Richard Aisbitt

Wiltshire is the largest wholly inland county in southern England and part of the ancient kingdom of Wessex. Stonehenge is a familiar sight to travellers passing through the county on the A303 and attracts visitors from around the world. Apart from the sprawling conurbation of Swindon in the north-east, however, the county is very rural and its wide, rolling landscapes are not well known to many. For botanical recording purposes it is split fairly equally by the Kennet & Avon Canal into the vice-counties of North Wiltshire (v.c.7) and South Wiltshire (v.c.8).

The county's bedrock is wholly sedimentary. Locals sometimes call Wiltshire the land of 'chalk-and-cheese'; soft Cretaceous chalk underlies more than half of Wiltshire, outcropping as three extensive tracts of downland: Salisbury Plain and Cranborne Chase, in the south, and the Marlborough and Pewsey Downs, in the north. Thin rendzinas and other calcareous soils dominate, but mildly acidic clay-with-flints superficial deposits are present on top of some of the chalk hills. Historically, sheep grazing was the dominant land-use and numerous ancient droveways criss-cross the landscape.

The 'cheese' is the flatter pastoral landscape of the north-west, where beds of heavy Oxford and Kimmeridge clay prevail, giving way to Jurassic limestones in the Cotswold borderlands, near Bath. Contrary to what some think, Wiltshire is not without sandstone; greensand is exposed in places, most notably in the Vale of Wardour close to the Dorset border and in the Vale of Pewsey.

Chalk downland

Wiltshire's chalk downland is rich in species and home to many rarities, including southern specialists such as *Carex humilis* (Dwarf Sedge) and *Thesium humifusum* (Bastard-toadflax). Salisbury Plain, which is around the same area as the Isle of Wight, has been used by the military for training purposes for more than a century and is now the

Cirsium tuberosum growing in CG3 chalk grassland on Salisbury Plain. *Sharon Pilkington*

largest remaining tract of unimproved calcareous grassland in north-western Europe. Its downland has been managed in different ways and this has greatly influenced its grassland communities. In the eastern (Bulford and Tidworth) ranges very rich short chalk grassland supports numerous specialities and rarities, including the southernmost British population of *Astragalus danicus* (Purple Milk-vetch), *Juniperus communis* ssp. *communis* (Juniper) and *Euphrasia pseudokerneri* (Chalk Eyebright). Disturbed chalk track margins are common on the plain and are a nationally rare and mostly unrecognised type of vegetation community. Notable disturbance-dependent annuals in this vegetation include *Cerastium pumilum* (Dwarf Mouse-ear), *Sabulina tenuifolia* (Fine-leaved Sandwort), *Filago pyramidata* (Broad-leaved Cudweed) and *Clinopodium acinos* (Basil Thyme).

The remote central impact area (Larkhill and Westdown Ranges) supports Wiltshire's only populations of *Galium pumilum* (Slender Bedstraw) and *Dianthus armeria* (Deptford Pink). *Cirsium*

Filago pyramidata on Salisbury Plain. *Sharon Pilkington*

Phyteuma orbiculare. *Sharon Pilkington*

tuberosum (Tuberous Thistle) is a national rarity of the Warminster and Imber Ranges. Prior to military occupation, valleys around the abandoned village of Imber used to be cultivated and strong populations of the rare *Galeopsis angustifolia* (Red Hemp-nettle) and other farmland archaeophytes persist where tanks and other military vehicles mimic the action of the plough.

Visitors wishing to see some of the county's best downland plants might consider Pewsey Downs National Nature Reserve (NNR), which is a long winding chalk ridge taking in Wiltshire's loftiest hills (Tan Hill and Milk Hill, both at 295m AOD). These downs have been sheep-grazed for centuries and the resultant tightly grazed turf is rich in plant species. Highlights include *Phyteuma orbiculare* (Round-headed Rampion) and *Tephroseris integrifolia* ssp. *integrifolia* (Field Fleawort). Walkers Hill and Knap Hill are good places to see orchids, including *Neotinea ustulata* (Burnt Orchid), *Coeloglossum viride* (Frog Orchid) and *Platanthera bifolia* (Lesser Butterfly-orchid).

Calcareous rivers and streams

Three main river systems drain the county. In the south, aquifers underlying the chalk of Salisbury Plain and other downs feed the River Avon (also known informally as the Salisbury, Hampshire or Christchurch Avon), a beautiful, clear, chalk river of international conservation importance. In the north, the River Kennet rises from the chalk of the Marlborough Downs as a tributary of the River Thames, whose source is in the Cotswold limestone near Kemble, on the county border with Gloucestershire. The ancient Braydon Forest and numerous flooded gravel pits of the Cotswold Water Park are intrinsically linked to the floodplain of the Thames. West Wiltshire is drained by a second River Avon (dubbed the Bristol Avon).

In summer, flowering beds of *Ranunculus penicillatus* (Stream Water-crowfoot) are a particularly distinctive feature of Wiltshire's chalk and limestone rivers. This is one of a number of characteristic riparian species, including *Sparganium emersum* (Unbranched Bur-reed), *Zannichellia*

Ranunculus penicillatus in the River Avon at Milston. *Sharon Pilkington*

palustris (Horned Pondweed), *Sagittaria sagittifolia* (Arrowhead), and, more locally, *Oenanthe fluviatilis* (River Water-dropwort) and *Potamogeton perfoliatus* (Perfoliate Pondweed). *Salix purpurea* (Purple Willow) is a frequent sight on the banks of the Salisbury Avon.

Fishing interests restrict access to the best chalk rivers, but a visit to the Bristol Avon in summer is certainly recommended. This river flows through the middle of the picturesque town of Bradford-on-Avon and is the locus for several national rarities, including *Potamogeton nodosus* (Loddon Pondweed). Careful searches of riverbank nettle beds in late summer are required to find *Cuscuta europaea* (Greater Dodder), a hemi-parasite with larger flowers than its more common relative. *Dipsacus pilosus* (Small Teasel) and *Butomus umbellatus* (Flowering-rush) are also common in this area. The Avon is also a good place to see floating plants, including the flat form of *Lemna gibba* (Fat Duckweed) and *Spirodela polyrhiza* (Greater Duckweed).

Floodplain (hay) meadows

Unimproved neutral grassland (hay-meadow) is now one of Britain's rarest lowland habitats, but the upper Thames floodplain retains some fine examples. North Meadow NNR at Cricklade is perhaps the best known such site in the county. An extensive Lammas meadow lying between the River Thames and River Churn, its spectacular display of *Fritillaria meleagris* (Fritillary) attracts visitors from far and wide each April. Old flood drains across the site support *Oenanthe fistulosa* (Tubular Water-dropwort), *Carex disticha* (Brown Sedge) and *C. acuta* (Slender Tufted-sedge).

Similar meadows support *Dactylorhiza incarnata* ssp. *incarnata* (Early Marsh-orchid) and *Ophioglossum vulgatum* (Adder's-tongue). Later on, *Dactylorhiza praetermissa* (Southern Marsh-orchid) may be abundant, sometimes alongside *Carex hostiana* (Tawny Sedge) or *C. distans* (Distant Sedge).

A great site to visit is Clattinger Farm NNR, a botanical gem tucked away on the edge of the Cotswold Water Park. Still a working farm, Clattinger's complex of small ridge-and-furrow meadows escaped the agricultural improvement that led to the loss of most traditionally managed lowland hay meadows after the Second World War. The farm lies on hydrologically complex ground,

Species-rich hay meadow, with *Primula veris* and *Anacamptis morio*, at Clattinger Farm NNR. *Sharon Pilkington*

meaning that the meadows have different botanical flavours and in some, calcicoles and calcifuges are juxtaposed with typical neutral grassland plants.

A visit to Clattinger in late spring or early summer is a breathtaking but sad reminder of what has been lost from so much of our countryside. The spectacle begins in April and May, when thousands of *Anacamptis morio* (Green-winged Orchid) and *Primula veris* (Cowslip) carpet the meadows. By June, the meadows are ablaze with colour and this is the time to see the rare *Carex filiformis* (Downy-fruited Sedge), along with numerous indicators of unimproved neutral grassland e.g. *Sanguisorba officinalis* (Great Burnet), *Silaum silaus* (Pepper-saxifrage), *Serratula tinctoria* (Saw-wort) and *Thalictrum flavum* (Common Meadow-rue). *Brachypodium pinnatum* (Heath False-brome) is common in ungrazed margins of some meadows. Go before the hay is cut in July. The Cotswold Water Park is a very important area for both sexes of *Populus nigra* ssp. *betulifolia* (Black-poplar) and several old males grow in Clattinger's hedges. By June, these trees are often infested with *Pemphigus spyrothecae*, an aphid that causes a spiral gall in the petiole.

Woodland

Compared to some other counties in southern England, Wiltshire is not especially well wooded, but it does have some fascinating tracts of ancient woodland. Specialities of ancient oolitic limestone Ash-maple woods include *Sorbus torminalis* (Wild Service-tree), *Lathraea squamaria* (Toothwort), *Ornithogalum pyrenaicum* (Spiked Star-of-Bethlehem), *Polygonatum multiflorum* (Solomon's-seal) and *Helleborus viridis* (Green Hellebore). *Colchicum autumnale* (Meadow Saffron) and *Ervilia sylvatica* (Wood Vetch) are characteristic of some old clay woods and Beech hangers on the chalk often support notable populations of orchids, including *Cephalanthera damasonium* (White Helleborine) and *Hypopitys monotropa* (Yellow Bird's-nest).

Savernake Forest, an ancient wood-pasture dating back 1,000 years or more within latter-day deciduous plantations on a hill above Marlborough is always worth a visit. In a Wiltshire context, it is unusual because it lies on a hill cap of clay-with-flints and this, together with small deposits of Valley Gravels, Reading Beds and Bagshot Sands, gives rise to acid soils. Relicts of the ancient wood-pasture remain, represented by distinctive open-crowned veteran specimens of *Quercus petraea* (Sessile Oak) and *Q. robur* (Pedunculate Oak). The hybrid between these two oaks (*Q.* x *rosacea*) is also common.

Savernake is one of the best woodlands in Wiltshire for ferns, supporting at least ten species. Sandy track edges and acid grassland are home to many calcifuges, including *Ceratocapnos claviculata* (Climbing Corydalis), *Ornithopus perpusillus* (Bird's-foot), *Agrostis vinealis* (Brown Bent) and *Avenella flexuosa* (Wavy Hair-grass). Visitors in late summer may be lucky enough to see the beautiful *Epipactis purpurata* (Violet Helleborine) in flower.

Epipactis purpurata at Savernake. *Sharon Pilkington*

More information

Wiltshire has a very active botanical society whose members have been collecting records county-wide for the BSBI Atlas 2020 project. The Wiltshire Botanical Society (www.wiltsbotsoc.co.uk) also arranges a programme of field programmes, walks and training throughout the year and warmly welcomes prospective members, whatever their interest and level of expertise.

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BEGINNER'S CORNER

Grid references and GPS

JIM MCINTOSH

A biological record has four essential elements: *What* (species), *Where* and *When* (it was recorded) and by *Whom* (recorder name). Of course, it may contain other important information, such as the abundance, extent, whether flowering or fruiting (stage) and whether natural or planted (status). But such is the importance of the four 'Ws', that a record is not considered to be valid unless it contains all four of these elements.

The 'Where' contains two parts: a site name and a precise geographic co-ordinate – in other words, a grid reference. This short article aims to help you to provide a correct grid reference. The obvious place to start looking is a paper map. Very helpfully, Ordnance Survey tells you how to calculate a grid reference for anywhere to the nearest 100m (a six-figure grid reference) under Technical Information in the legend of every map. Take a look! Briefly, a complete grid reference starts with one (in Ireland) or two letters (in Great Britain) which indicate the 100km x 100km grid square you are located within (Fig. 1), followed by a series of digits that indicate your position from west to east ('eastings') and another series of digits which indicate your position south to north ('northings') (Table 1).

There are three important points to remember about grid references. The main one is that they describe grid squares, not points, and that the reference always refers to the bottom left (south-west corner) of the grid square, regardless of resolution. Your point(s) of interest should lie within the square that the grid reference describes, so when estimating, it is important always to round down.

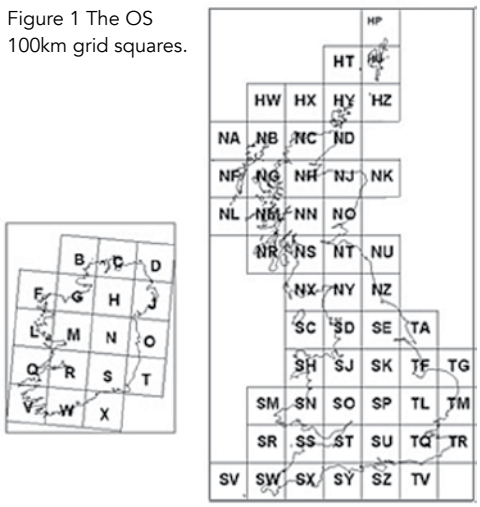

Figure 1 The OS 100km grid squares.

The second point is always to choose a grid reference that most accurately describes your population, site or survey area. As a minimum, we recommend you give ALL records collected for the BSBI at least 4-figure (1km resolution) grid references. But rare plant populations should always be given at least six or more figure grid references. Never use a central grid reference for a large site – this is misleading and just leads to confusion.

Table 1 Examples of grid references. *When quoting grid references you usually just omit the spaces.

Grid Reference	Grid square size	Example grid reference*	Eastings	Northings
Letter(s) only	100 x 100km	NN		
2 figure	10 x 10km (A hectad)	NN 0 - - - - 5 - - - -	0	5
4 figure	1 x 1km (A monad)	NN 01 - - - 56 - - -	01	56
6 figure	100 x 100m	NN 012 - - 567 - -	012	567
8 figure	10 x 10m	NN 0123 - 5678 -	0123	5678
10 figure	1 x 1m	NN 01234 56789	01234	56789

Checking out a grid reference using an OS map and a GPS device. *Andrew Branson*

Lastly, remember that it is vital to give the site a name, as well as a grid reference, as this provides a way to confirm and verify the grid reference. Records without place names are less likely to be trusted.

Although giving grid references from maps is pretty simple, it is time consuming and prone to error, especially if you are on featureless terrain and it is difficult to know precisely where you are. Fortunately, handheld GPS units are now cheap and widely available. Even the most basic models will do more than most recorders ever need, and are just as accurate as more expensive models, so I would recommend the Garmin eTrex 10.

Using smartphones

Most smartphones can also be used as a highly accurate GPS, using apps such as 'GB Grid Ref Compass' or 'Irish Grid Ref Compass'. At a tap of a finger these apps will text, email or tweet your location, along with any notes (e.g. species names, photographs, etc) to yourself or others, along with the precise date, time and grid reference. You do not even need a mobile signal, as the location messages will be stored ready to send once one becomes available. This is a very handy app for making ad-hoc records. Just beware that, unlike a GPS, most phone apps will give a 10-figure grid reference before it has accurately pinpointed your position. Fortunately, the phone's GPS accuracy is displayed in these apps alongside the grid refence, and you MUST wait until your smartphone accuracy improves to less than 10m before taking a reading.

Another option is the iRecord phone app which was designed specifically for recording wildlife observations, either individually or in 'grid-based' mode (i.e. for making lists for grid squares). Using apps such as iRecord and the form we used for the New Year Plant Hunt, has the great advantage of automatically associating the records directly with your GPS grid reference and avoids the need for laboriously copying grid references from GPS onto recording cards and then back into a computer, when it can be easy to make a mistake. Cleverly, iRecord gives each individual record the most accurate grid ref available at that time. So, if you are at the foot of an overhanging cliff and have a very poor GPS signal it might give your record a 4-figure resolution, but if you are out in the open it might give it an 8-figure resolution.

As well as being able to obtain grid references, GPS devices and smartphones can also be used to show your position against a map. GPS devices that can do this are expensive, and the maps you need to buy (separately, of course) are a further expense. A low-cost alternative is to download the OS Map app, register with OS and download the map tiles for which you have maps, which are marked 'Includes Digital Download'.

Finally, a word of warning: it is never a good idea to totally rely on GPS devices or smartphones for navigation in the field. Many of these apps rapidly drain the batteries, so it is always good to have spare batteries for devices and a Powerblock from which you can recharge your smartphone. However, even then technology may still fail you, in which case paper maps and compasses and the ability to use them is still essential.

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ADVENTIVES AND ALIENS NEWS 18

COMPILED BY MATTHEW BERRY

I will keep the pre-amble short, so as much of the available space as possible is filled with members' records – the most important part of this column! I have included further records of taxa I highlighted in the previous Adventives and Aliens News as apparently increasing or at least as being better recorded (and to which I might have added *Cardamine occulta* and *Mitella ovalis*), as well as another potted summary of a Norfolk alien from first record through to the present, and trust that readers find them as fascinating as I do. There are records for two *Muscari* cultivars which deviate so drastically from the morphometric norm that even their genus is not obvious. I do not know how readers feel generally about the inclusion of cultivars in a column such as this – they can certainly be hard to name with precision and I only hope that these have been named correctly. There is also an update relating to the distribution of *Allium trifoliatum* (Hirsute Garlic) in south-west England (see v.c.1a), communicated to me by Ian Bennalick. I have tried to maintain the wider regional coverage of the last News, but I am aware that Scottish vice-counties in particular have been under-represented, and would like to right that as far as I can in News 19. Many thanks.

V.c.1a (W. Cornwall)

Parrotia persica (DC.) C.A. Mey. (Persian Ironwood). South of St Agnes (SW72684898), 7/2/2017, C.E. Wild (det. D.A. Pearman): three small, well-growing trees by roadside. A deciduous tree, native to Iran (Hamamelidaceae). The alternate, glossy green, beech-like leaves have undulate margins, pinnate venation and turn shades of yellow, orange and red in autumn. They are preceded in early spring by small, red (the colour of the stamens), apetalous flowers, similar to those of *Hamamelis* (witch-hazel) species. The mature bark peels off leaving paler patches. The fruit is a two-seeded capsule. It often remains a bush in this country, but can attain a height of 12m in Iran. There are 38 additional records in the DDb, mostly for vcc.17, 21 and 22.

Parrotia persica, v.c1a. *C. Wild*

Muscari armeniacum 'Blue Spike', Bushey, v.c.9. *G. Yoemans*

Allium trifoliatum (Hirsute Garlic). Near Gulval (SW49843309), 12/5/2019, A. Young (conf. P. Green/comm. I. Bennalick): one plant in Little Treassowe. This turns out not to have been the first Cornish record, as a 2012 record of *A. subhirsutum* (Hairy Garlic) also proved to be *A. trifoliatum* when re-examined. The other five post-1995 Cornish records of *A. subhirsutum* are to be re-checked, to see if any of these are *A. trifoliatum* too. Ian also informed me that a 2007 v.c.3 (S. Devon) record of *A. subhirsutum* at Borringdon Park, Plymouth, has been re-determined by him as *A. trifoliatum* (conf. P. Green), and this is the first confirmed v.c.3 record. Stace (2019): 946.

V.c.4 (N. Devon)

Mitella ovalis (Bishop's Cap). Near South Molton (SS7794525945), 23/4/2019, R. Hodgson: a good sized patch in the middle of an area of semi-natural woodland. Rob thinks the plants are a survival of plantings by the previous owner and they were growing with *Cornus sericea* (Red-osier Dogwood) and *Polygonatum* × *hybridum* (Garden Solomon's-seal). The first record for a southern English vice-county. Stace (2019): 143.

V.c.6 (N. Somerset)

Capsella rubella (Pink Shepherd's-purse). Bath (ST74996364), 27/2/2018, H. Crouch & D. Green (det. D. Green/conf. T. Rich): many plants on bank in grounds of Beechen Cliff School, by footpath. The second record for v.c.6 and the first since 1949. There are some 252 records in the DDb. The hectad map indicates a strongly southern distribution, with a more recent concentration of records for the central portion of the south coast of England. Rich (1991): 242–243.

V.c.9 (Dorset)

Muscari armeniacum 'Blue Spike' (Grape Hyacinth). Bushey (SY9760085240), 19/4/2019, G. Yoemans (det. M. Berry): in Thrashers Lane. This is probably just a double-flowered variant of the species.

V.c.11 (S. Hants)

Berkheya purpurea (DC.) Mast. (Purple Berkheya). Chandlers Ford (SU43272064), 24/7/2018, D. Leadbetter (comm. D. Leadbetter): clump on disused railway platform. A South African perennial (Asteraceae) arising from a rosette of large, prickly, thistle-like leaves, up to 45cm × 10cm, and densely white-hairy below. The radiate capitula, with pale mauve to purple ligules and darker purple disc florets, are up to 8cm across and carried on short branches off the stem. It can reach a height of c. 75cm. There is only one other record in the DDb, for v.c.105 (W. Ross), where found by M.J. Crawley. It is a member of the tribe Arctotideae along with *Gazania*, *Arctotis*, *Arctotheca*, and formerly also *Ursinia*.

V.c.13 (W. Sussex)

Cardamine occulta Hornem. (Cryptic Bitter-cress). Storrington (TQ0772914264), /2019, S. Denness (conf. T. Rich): one plant in recorder's front garden. The first Sussex record. There are 12 records in the DDb, all for 2019, for v.cc.21, 29, 64, 95 and H12, mostly if not entirely from nurseries and garden centres. See *BSBI News* 135: 73–74, with photos on the inside of the back cover.

V.c.14 (E. Sussex)

Lathyrus odoratus (Sweet Pea). Holywell, Eastbourne (TV6092497941), 10/4/2019, M. Berry (conf. E.J. Clement): one non-flowering plant at base of wall, South Cliff. The second post-2000 Sussex record. Presumably from seed ejected explosively over the garden wall, above which Sweet Peas could be seen later in the season clambering up a 'wigwam' of bamboo canes. This archetypal garden plant is surprisingly rare as a straightforward garden escape, although it was once more commonly recorded on tips where garden waste had been disposed of.

Erodium trifolium Cav. (Heron's Bill). Mount Pleasant (TQ4589202125), 23/4/2019, M. Berry (conf. E.J. Clement): one plant self-sown between end of driveway and edge of footpath, Falaise Road. The first Sussex record. See Adventives & Aliens News 15 (v.c.15).

Diplotaxis erucoides (White wall-rocket). Hastings (TQ8156410423), 22/1/2019, J. Clark, J. Rose & E. Campbell (conf. M. Berry): c. six plants in reseeded area by pond, Alexandra Park. The second recent v.c.14 record.

Vaccaria hispanica (Cowherb). St. Anthony's Hill, Eastbourne (TQ62510149), 27/6/2019, M. Berry: four plants on verge of newly made cycle path, possibly from disturbed dormant bird seed.

Vicia pannonica, Fleetdown West, v.c.16. *D. Steere*

Muscari comosum 'Plumosum' (Feather Hyacinth). Newhaven (TQ4539400915, TQ4539100928), 18/5/2018, M. Berry & J. Reynolds: several plants between earth heaps, waste ground south of A259, east of Ouse, west of new road. Unmistakeable if you know it, rather confusing otherwise, as it bears little resemblance to normal *M. comosum* (Tassel Hyacinth). According to Wikipedia, the flowers and pedicels of this form have been replaced by purple branched stems. The plants look more spidery than feathery, such that the synonymous cultivar name 'Monstrosum' does seem appropriate, although the 'flower' colour is attractive.

V.c.15 (E. Kent)

Cucurbita moschata Duchesne (Butternut Squash). Oare (TR00296418), 18/7/2018; (TR00506423), 25/10/2018, L. Rooney & D. Chesterman: a soft-haired plant with Butternut squash-type fruit (the former) and a plant with typical *C. moschata* leaf markings (the latter), both on dumped rubble and soil at an old gravel working, also with *C. maxima* (Pumpkin) and *Cucumis melo* (Melon). For a photo of the plant with 'typical' leaves, see *Kent Botany* 2018, p. 11. The first Kent records and possibly only the third for Britain, the first being for v.c.112 (Shetland) in 2015. See *BSBI News* 136: 57–58 and *BSBI News* 139: 58–59.

Blitum virgatum L. (formerly *Chenopodium foliosum*) (Strawberry Goosefoot). Near Upchurch (TQ8367), 17/10/2018, D. Steere: 12 plants along a hedge bounding an apple/pear orchard, from TQ83316739 to TQ83246740. The only other notable alien was *Amaranthus hybridus* (Green Amaranth). Probably an escape from a garden/allotment in this case; in the past it was known as a grain and esparto alien, Clement & Foster (1994). The first clear-cut v.c.15 record, although it appeared spontaneously in a v.c.15 garden in 2017. See *Kent Botany* 2018, p. 10 for a photo. Adventives & Aliens News 8 (v.c.63). Stace (2019): 520.

V.c.16 (W. Kent)

Vicia pannonica (Hungarian Vetch). Fleetdown West (TQ5572), 16/5/2019, D. Steere (comm. G. Kitchener): a substantial colony on both sides of the B260 for 100m or so east of the A282 bridge. A native of the Mediterranean, it was first seen in this tetrad in 1977, but probably in a different location (where last seen in the 1990s). David thinks that the present population might date back to the late 1980s when the A282 was widened, and large amounts of soil and sand were brought in for the purpose. *Lathyrus aphaca* (Yellow Vetchling) is an associate. He describes the plants as resembling an anthocyanin-deficient *Vicia sativa* (Common Vetch), but points out that they are

hairier and tend to have leaves with more leaflets, further commenting that 'the off-white flowers with brown veins' are distinctive. See *BSBI News* 34: 26 for a drawing by Hilli Thompson. According to the DDb, there have only been two other post-2010 records, the most recent for 2015 was in v.c.62.

V.c.17 (Surrey)

Clerodendrum bungei Steud. (Glory Flower). Woking (TQ0361), 24/8/2018, G. Hounsome (det. E.J. Clement): spreading by rhizomes into verge, Byfleet Road, 'probably from one planted in the nearby hedge'. A deciduous shrub, native to Asia (Lamiaceae), it has dense, terminal, umbel-like clusters of flowers which are a much darker pink than those of *C. trichotomum* Thunb. var. *fargesii* (Dode) Rehder (Farge's Harlequin Glorybower), but otherwise very like them in general form. The leaves are opposite, ovate (c. 14cm × 8cm), more or less glabrous, much paler below, coarsely sinuate-dentate and acuminate at the tips. When crushed they have a smell similar to those of *Iris foetidissima* (Stinking Iris). A garden shrub typically to 1.5m (potentially to c. 3m) which suckers very freely. There are only three other records in the DDb, the first for 1983 (v.c.16) and the other two also for v.c.17.

V.c.19 (N. Essex)

Senecio vernalis (Eastern Groundsel). Kelvedon (TL854185), 5/5/2019, B. Fisher (det. K. Adams): at least one plant in rough ground near track in station car park. The first Essex record. See *BSBI News* 41: 13 for Graham Easy's drawing of a Cambridgeshire (v.c.29) plant from 1985, which captures well what the artist describes as its 'tall, narrowly erect habit'. A native of eastern Europe which has usually been introduced to this country in grass seed. There are eight post-2010 records in the DDb (excluding this one) for v.cc.8, 11, 13, 32, 46 and 59.

V.c.21 (Middlesex)

Cercidiphyllum japonicum Siebold & Zucc. (Katsura). Old Brompton Road, SW5 (TQ2570078300), 13/6/2011, M.J. Crawley (the recorder in all following cases); Regents Canal (TQ2725082800, TQ2725083100), 30/6/2016; Boileau Road, W5 (TQ1880081350), 17/9/2016; Powerscroft Road, E5 (TQ3530085700), 28/10/2017: there are 16 records in the DDb for this deciduous tree (Cercidiphyllaceae) native to China and Japan, with five each for v.cc.21 and 22, and the rest for v.cc.9 (planted), 17, 39, 44 (planted) and 68, spanning the period from 1997 to 2017. In shape, colour, texture and palmate venation its leaves are rather like those of *Cercis siliquastrum* L. (Judas-tree) (Fabaceae), but they are opposite and crenate-serrate in *Cercidiphyllum*, alternate and entire in *Cercis*. While seedlings certainly occur in western Europe, it is just as likely to be a surviving relic of cultivation in this country.

V.c.27 (E. Norfolk)

Phedimus stoloniferus (formerly *Sedum stoloniferum*) (Lesser Caucasian-stonecrop). Near Attlebridge (TG152168), 6/7/2015, R.W. Ellis, R. Leaney & J. Parmenter: two (the second at TG154167), large, well-established patches on Marriotts Way (disused railway track and long-distance walk). The second record for v.c.27, the only other being for Earlsham in 2002. See Adventives & Aliens News 1 (v.c.14). For photos showing habit and inflorescence, see *BSBI News* 133, Colour Section 2. See v.c.58.

Epilobium brachycarpum (Panicled Willowherb). Norwich (TG2610), 16/8/2016, Norfolk Flora Group: one plant in recent clearfell area, private woodland site; Norwich area (TG26811393), 4/9/2018, R. Leaney & J. Parmenter: about ten plants beside new dual carriageway, some 4km due north of previous record. The first and second Norfolk records respectively. Stace (2019): 385.

Diplotaxis erucoides (White Wall-rocket). Cley (TG04), 3/12/2018, M. Ball: on arable margin next to Old Woman's Lane. Found in flower and confirmed later in fruit by R.W. Ellis. The first v.c.27 record. It has recently been increasing in v.cc.53 and 54 (S. & N. Lincs) on arable and waste ground, and possibly less obviously in other vice-counties too. It could also occur as a container weed of potted olive trees and as a weed of flower beds. See v.c.14.

Senecio inaequidens (Narrow-leaved Ragwort). TG41, TG50, R. Leaney: 'First encountered in the county at Sheringham Park on the north Norfolk coast, in 2005, the species is now a frequent casual, particularly in coastal urban locations (e.g. Great Yarmouth and King's Lynn) and is well-established in the semi-natural dune system along the coast between Great

Yarmouth and Sea Palling. At Waxham, the first few plants arrived on a car park used by coastal flood defence contractors (TG45442522), and by 2007 about 500 plants were present and spreading into the mobile dunes. Over the past ten years the largest population has been at Yarmouth Docks (v.c.27) and the nearby coastal dune system; a similar spread has been observed from Caister Lifeboat Station car park into the adjacent dunes. The species has spread in recent years to Acle, Norwich and other urban locations within the county'. Stace (2019): 801.

V.c.28 (W. Norfolk)

Coincya monensis ssp. *cheiranthos* (Wallflower Cabbage). East Dereham (TF994128), 12/9/2017, R. Leaney, J. Parmenter & T. Doncaster (det. T. Rich): on railway ballast in marshalling yard at Mid Norfolk Railway. Associates included *Chaenorhinum minus* (Small Toadflax) and *Senecio squalidus* (Oxford Ragwort) and it is 'thought likely to be the remnant of a long standing population'. In Clement & Foster (1994) it is designated as a ballast alien.

V.c.35 (Mons.)

Allium paradoxum (Few-flowered Garlic). Chepstow Park Wood (ST4996), 8/4/2018, E. Wood & A. Wood;

Nonea lutea, Stratford-upon-Avon, v.c.38. *J. Roberts*

Grosmont (SO4024), 28/4/2018, S. Tyler & E. Wood; Penallt (SO5109), 6/5/2018, S. Tyler: the first records for the vice-county since 2006 (the earliest in the DDb for Monmouthshire). Booy *et al.* (2015) note that it is 'spread mainly by bulbils by vehicles and footwear, rarely by ant-dispersed seed.' They list 'Damp woods, grassy habitats, rough ground and waysides' as the places where it is most likely to establish.

V.c.38 (Warks.)

Nonea lutea (Yellow Nonea). Stratford-upon-Avon (SP22185317), 6/5/2019, J. Roberts (det. M. Berry/ conf. J. Walton): one plant in the lawn of a business park. See Adventives & Aliens News 4 (v.c. 7). The first county record. Stace (2019): 592.

V.c.58 (Cheshire)

Phedimus stoloniferus (Lesser Caucasian-stonecrop). Lymm Dam (SJ68Y), 6/10/2016, G.M. Kay (det. R. Stephenson): large patch on old wall. The first v.c. record.

Aurinia saxatilis (Golden Alison). Dean Row (SJ877819), 5/6/2018, G.M. Kay: several plants on old wall. Feral plants occur far less frequently than those of *Aubrieta deltoidea* (Aubretia), although it is almost as popular in rockeries.

Dittrichia graveolens (Stinking Fleabane). High Legh (SJ685849); Stretton (SJ621821), 25/9/2016 (both), P. Stanley (both): spotted in central reservation of M56. The first and second v.c. records respectively. See Adventives & Aliens News 13 (v.cc.59 & 60).

Levisticum officinale (Lovage). Antrobus (SJ650625), 8/2015, G.M. Kay: one plant in old lane. The first v.c. record. Many records probably coincide with places where it was once cultivated. Clement *et al.* (2005): 206; Tutin (1980): 161.

Pastinaca sativa ssp. *urens* (Eastern Parsnip). Ringway (SJ88C), 7/2014, P. Jepson (det. G.M. Kay): now known to be abundant round Ringway and common along M56 west to Frodsham. The first v.c.58 record.

V.c.59 (S. Lancs.)

Pittosporum tenuifolium (Kohuhu). Ainsdale (SD3035211649), 21/3/2019, P.H. Smith: one bush close to housing on SSSI, Falklands Way dunes, much

Pittosporum tenuifolium, Ainsdale, v.c.59. *P.H. Smith*

Saxifraga hostii, Settle, v.c.64. *M. Wilcox*

used for tipping of garden waste. First noted in 2012 (det. M. Wilcox), it has grown considerably. There are only a very few mapped records for north-west England. Self-sown plants are more widespread than is suggested on p. 838 of Stace (2019), e.g. they are occasional in Eastbourne and Bexhill (both v.c.14), and probably overlooked.

V.c.64 (Mid-W. Yorks.)

Saxifraga hostii (Silver Saxifrage). Buckden (SD94287729), 4/6/2018, M. Wilcox: on the outside of a garden wall by a footpath, with *Chiastophyllum oppositifolium* (Lamb's-tail) and *Saxifraga cuneifolia* (Lesser Londonpride). A second v.c.64 site for this species, the other being in Settle (SD8176464130), where it was still present in 2019 (pers. comm. M. Wilcox). Stace (2019): 138.

Acer rubrum (Red Maple). Fewston Reservoir (SE1792154575), 30/8/2018, M. Wilcox: the only v.c.64 record in the DDb. Stace (2019): 395.

Cotula alpina (Upland Leptinella). Dallow Moor (SE19206902), 21/6/2017, K. Walker (the recorder in all following cases); Skell Gill Bank, Dallow Moor (SE19146893), 21/6/2017; Lulbeck Head (SE140741), 7/7/2017; Fountains Earth Moor, Upper Nidderdale (SE142720), 7/7/2017. This is a small selection of the 111 v.c.64 records held in the DDb, dating from 1975. Kevin has been monitoring its spread in Nidderdale and the N. York Moors. Already 'superabundant' in some areas, he suspects that 'it will increase further along tracks on gorse moors in Northern England'. He further elaborates that it particularly favours 'the gravel tracks that are used to access grouse butts or shooting lodges on heather moorland', that 'it also forms lawns around the lodges themselves, or where grazing has extended the grass onto the moor (often following disturbance). Very occasionally it also colonises burnt heather moorland or *Sphagnum* in ditches along the edges of tracks'. He further notes that it seems to spread effectively by stolons, plants in his garden advancing c. 10cm by

Epilobium pedunculare, Beinn Mor, v.c.110. *P.A. Smith*

this method in the space of a few months. A native of New South Wales and Tasmania, the precise means of its introduction to this area is unknown. It also occurs in v.cc.62, 65 and 105. See *BSBI News* 113:52-54. Stace (2019): 799.

V.c.110 (Outer Hebrides)

Epilobium pedunculare (Rockery Willowherb). Beinn Mor, S.Uist (NF80883111), 13/8/2018, J. Faulkner & P.A. Smith (conf. G. Kitchener): a few plants at 550m, in 'natural habitat', with *Epilobium brunnescens* (New Zealand Willowherb) growing close by. The first v.c. record. Paul adds that the nearest site is in v.c.87 (W. Perth), c. 200km away and admits that it is a mystery how it came to be in South Uist, 'and particularly so far from habitation'. Clement *et al.* (2005): 174. Stace (2019): 384.

V.c.H12 (Co. Wexford)

Campanula ramosissima Sm. (Ketun Bellflower). Clonjordan (S9286846414), 4/6/2019, P. Green (conf. M. Berry): one plant at side of track flanked by fields where broad beans were being grown as a crop, with no gardens nearby. The first Irish record and the second for Britain and Ireland as a whole – see Adventives & Aliens News 4 (v.c.14). The Eastbourne plant was on rough ground by a road where vehicles drive in and out of a large fenced allotment.

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Euphorbia palustris (Marsh Spurge) in v.c.14 and beyond

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As a native, *Euphorbia palustris* L. (Marsh Spurge) is found Europe-wide in marshy places, but is rare and seems to be declining as a result of habitat loss. It is also grown as a garden plant and this relatively recent (?) development has meant that the species is now being recorded as a casual or established garden escape, even in countries where it is unknown as a native, such as Britain and Ireland. The first Sussex record was made in 2015: Gray Wood (v.c.14), TQ5360816755, 23/5/2015, H. Proctor & P. Smith (det. E.J. Clement): one large plant on verge opposite Graywood Cottages.

There are 27 other records in the DDb for the following vice-counties: 16, 17, 18, 20, 21, 22 (7

Euphorbia palustris, Gray Wood, v.c.14. *H. Proctor*

records), 55, 62, 69, 107 and H6. The earliest (2003) is for H6 (Co. Waterford, Paul Green). The bulk (19) are for what could be described as the 'Greater London' area, with 12 such records in 2017 alone, and all recorded by M.J. Crawley. The most northern are for v.cc.69 (Westmorland, G. Halliday in 2006) and 107 (E. Sutherland, M.J. Crawley in 2016).

In Belgium, it is described as being 'very rare but lately much increasing' (F. Verloove, *The Manual of the Alien Plants of Belgium*) and is now well established in a river valley in West-Vlaanderen, where it was introduced in the first instance. There is also a suggestion that the 'extant populations apparently represent a very competitive race (originating in cultivation?)'.

Description

According to the treatment adopted in *Flora Europaea*, it belongs in Section Helioscopia, members of which are characterised by the presence of capsules with a hardened pericarp, entire (as opposed to falcate/concave) glands and bracts between the male flowers, as exemplified by the species which gave this section its name, *Euphorbia helioscopia* (Sun Spurge). It keys to *Euphorbia hyberna* (Irish Spurge) in Stace (2019), a native species which is found in south-west Ireland and on the north Devon coast of England. *E. oblongata* (Balkan Spurge) and *E. dulcis* (Sweet Spurge), likewise both placed in Section Helioscopia, are also similar in general appearance and habit. The following description of *Euphorbia palustris* is a sort of composite of my own observations and information culled from Polunin (1968) and www.actaplantarum.com:

> a robust (potentially very robust and vigorous), subglabrous, patch-forming perennial to 150cm; leaves dull (glaucous) green, with pale mid-vein raised below, narrowly oblong-elliptic to lanceolate, acute, sometimes ciliate becoming more or less glabrous, margins often serrate distally, to c.12cm; flowering stems more or less glabrous with lateral non-flowering branches; bracts yellow, shortly oblong-elliptic, obtuse, 9–14mm; inflorescence an umbel consisting of five to eight rays; capsule three-angled, c. 5–7mm across, with shortly cylindrical papillae; glands yellow, entire, usually four per cyathium.

E. palustris readily produces leafy, lateral non-flowering branches from the leaf axils of its flowering stems, which do not seem to be formed in *E. hyberna*. There could also be a difference in the usual number of glands present on the cyathium, with four being the norm for *E. palustris* and five for *E. hyberna*, although this requires final confirmation.

Observations of the Gray Wood plant and of

a plant seen in a Surrey allotment (pers.com. E.J. Clement) suggest that plants in cultivation are not as truly glabrous as their native counterparts. Or it could be that native plants are hairier than the consensus seems to allow. In *Flora Europaea* it is simply described as 'glabrous', and this is the adjective used in the few other descriptions I have been able to find.

The Gray Wood plant was much diminished in area and vigour by 2016, even if sending out still vigorous sterile side-branches, and looked as if it would not survive much longer, although I have not returned to the site since to confirm its disappearance. It could perhaps become established in damper sites. I would be very interested to receive details of post-2018 records of *E. palustris* for publication in Adventives & Aliens News. See Adventives & Aliens News 17, for details of a v.c.62 record.

Acknowledgements

I would like to thank Helen Proctor and Peter Smith for providing me with the details of their record, Helen Proctor for the use of her photograph of the Gray Wood plant, Paul Green and Clare Heardman for letting me see their excellent close-up photographs of *E. hyberna* flowers; and Eric Clement for determining the plant in 2015 and for his input generally.

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Novelties in your garden

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If, like me, you never pull out a young plant in your garden unless you know what it is and can confirm its unwanted status, you will now and again be pleasantly surprised at what it grows into. That is my experience, which has sometimes rewarded me with unexpected hybrids.

I have usually grown *Digitalis purpurea* (Foxglove) and *D. lutea* (Straw Foxglove) in the garden, and several times the very distinctive hybrid between them, *D.* × *fucata*, has appeared. In the early part of this century, I had a single plant of *Primula elatior* (Oxlip) in my Leicestershire garden, and one year I found beside it a vigorous and long-lived plant of what was obviously an Oxlip × garden *Polyanthus*, looking rather like the latter but with the dark green calyx-lines of *P. elatior* very pronounced. This is a version of *P.* × *murbeckii* (*P. elatior* × *P. veris* × *P. vulgaris*), which has been recorded from the wild in Britain. Mine, however, had an unattractive dull mauve corolla.

The latest surprise, this year, was a lupin. I had in the garden a few plants of *Lupinus arboreus* (Tree Lupin), a quite common plant around here, but they soon died out in the frosts. However, last year I noticed that one had given rise to a seedling, which I allowed to develop and this year showed itself to be a backcross to *L.* × *regalis* (Russell Lupin), as shown in the photo. Its parentage shows itself in the pale flower colour (N.B. *L. arboreus* can have blue flowers, although mine were yellow), short racemes, narrower leaflets and the presence of many lateral stem-branches bearing inflorescences. The stems show no sign of woodiness at this stage. The parentage is *L. arboreus* × (*L. arboreus* × *L. polyphyllus*).

I urge you to let your unidentified seedlings spring surprises on you, and you can also learn a lot by watching them as they develop.

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Lupinus arboreus x (*L. arboreus* x *L. polyphyllus*) growing in the garden at Appletree House. Clive Stace

The distinction between *Verbascum pulverulentum* and *V. speciosum*

CLIVE STACE

Verbascum pulverulentum (Hoary Mullein) is probably native in East Anglia (mainly Norfolk and Suffolk), but is more widely distributed in Britain as an alien, often only casual. *V. speciosum* (Hungarian Mullein), however, is an alien from south-eastern Europe, scattered throughout Britain and sometimes well naturalised, owing its origin here mainly because it is a very attractive garden plant ('*speciosum*' means showy or splendid). Both are tall biennials with a well-branched 'candelabra' inflorescence bearing several yellow flowers per node. With regard to their technical characters, both have the two lower stamens with longer and less hairy filaments than the three upper ones; all five anthers are symmetrical and capitate or reniform, i.e. those on the two lower stamens are not asymmetrical and adnate to the filament as in *V. thapsus* (Great Mullein); all the filament hairs are white; the stigma is minutely spathulate (not capitate as in *V. thapsus*); the leaves and stems are densely whitish-hairy, with much-branched hairs and no glandular ones; the basal leaves are persistent until fruiting, and have a cuneate or narrowly cuneate base; and the stem-leaves are not or are very shortly decurrent.

Their concordance in nearly all the main diagnostic characters means that these two species are sometimes difficult to distinguish, and are sometimes misidentified. My interest was aroused by the sight of a magnificent, well-dispersed colony of hundreds of flowering plants at Shingle Street, in East Suffolk. Locals who live in the houses behind the beach there told me that the colony has been there only 'five or six years', and that the plant is Hoary Mullein. It is, however, undoubtedly *V. speciosum*, occurring there along with *V. thapsus* and *V. phlomoides* (Orange Mullein). With the help and cooperation of the East Anglian botanists, Martin Sanford, Alan Leslie, Nick Millar and Graham Easy, I examined the Shingle Street *V. speciosum* colony, a fairly large population of *V. pulverulentum* by the A14 in West Suffolk, and smaller colonies of each species in and near Cambridge, Cambs. The differences between the species revealed by these limited studies are listed below; data in the literature and images on the internet confirm these characters, but further checking by other members would be most welcome.

1. The normally utilised difference in the leaf indumentum seems to be reliable: in *V. speciosum* the hairs remain thick and densely felted on both surfaces right through to fruiting, whereas in *V. pulverulentum* the indumentum wears off in patches at flowering time, when the leaves become floccose and patchily glabrous at least on the upperside. Even before then the indumentum can be rubbed off in *V. pulverulentum*, but not in *V. speciosum*.
2. The basal leaves are narrower, more gradually acute-acuminate at the apex (not abruptly acute to subacute), and more attenuate-cuneate at the base in *V. speciosum*.
3. The stem leaves of *V. speciosum* abruptly become much shorter from just above the rosette up to the inflorescence, so that a long stretch of stem is clothed with very short leaves, whereas in *V. pulverulentum* the leaves gradually become shorter up the stem, producing a plant much more leafy in appearance.
4. The stem leaves of *V. speciosum* are very undulate margined and often have long, narrowly acuminate apices, features lacking or much less extreme in *V. pulverulentum*.
5. The corollas are slightly larger in *V. speciosum*, with at least some >3cm across; all are <3cm across in *V. pulverulentum*.
6. The stigma is ovoid or spathulate in both species, but that of *V. speciosum* is larger, generally distinctly longer than wide rather than about as long as wide.

In known localities it would be worth examining plants on site to check whether they have been identified correctly.

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Small part of the Shingle Street colony of *V. speciosum*. *Clive Stace*

V. speciosum from Shingle Street, E. Suffolk. *Clive Stace*

V. pulverulentum from the A14, W. Suffolk. *Clive Stace*

Out of sight, out of mind? *Ex-situ* germination of X *Reyllopia conollyana* (Conolly's Knotweed) in a South Wales invaded seed bank

SOPHIE HOCKING, DR DAN JONES, PROFESSOR DAN EASTWOOD

X *Reyllopia conollyana* seedling growing in the Swansea University glasshouse facilities in May 2019. *Sophie Hocking.*

The knotweed *Reynoutria (Fallopia) japonica* var. *japonica* (Japanese Knotweed) is the most common of four key invasive taxa found in the UK (Stace 2019). Collectively, these invasive knotweeds, including any F2s or backcrosses, are referred to as 'Japanese Knotweed' *sensu lato* after Bailey & Conolly (2000).

In the UK non-native range, *R. japonica* has achieved public notoriety owing, in large part, to irresponsible media coverage, unclear control treatment options and frequently excessive costs associated with management, particularly where it is affecting residential property transactions. However, *R. japonica* is unique within the UK flora, in being a rhizomatous perennial geophyte (according to the Raunkiaer system), and it is this rhizome-forming growth strategy which underpins the genuine challenges that this knotweed presents.

In an ecological context, *R. japonica* is a fast-growing competitor (C-strategist; Grime, 2001), growing quickly from dormant rhizome buds early in the growing season. This early, prolific growth is powered by extensive rhizome reserves accumulated in previous growing seasons. The accumulation of a thick, persistent layer of leaves and dead stems from previous growing seasons is also a characteristic feature of knotweed patches or 'stands'. Owing to this, all but a few shade- and litter-tolerant vernal species, such as *Hyacinthoides non-scripta* (Bluebell) and *Arum maculatum* (Lords-and-Ladies), and/or climbing species that are able to grow up the stems and access the canopy, such as *Calystegia sepium* (Hedge Bindweed), can persist. These stands are typified by an impoverished flora and fauna, alterations to nutrient cycling and topsoil fertility and there are 'knock on' negative effects beyond the stand on terrestrial and aquatic invertebrates communities (Beerling *et al.*, 1994; Grime, 2001; Maerz *et al.*, 2005; Vanderhoeven *et al.* 2005;

Dassonville *et al.*, 2007; Gerber *et al.*, 2008; Seeney *et al.*, 2019).

Rhizomatous growth also impacts upon the built environment, with rhizomes capable of damaging and displacing man-made structures (EA, 2013), although such impacts are currently a topic of a highly contentious debate, particularly within the knotweed remediation industry (Fennell *et al.*, 2018). Rhizomes also impinge upon management of *R. japonica*, with depletion of the rhizome system by biocontrol or physical control treatments all but impossible, certainly within decadal timescales. Complete excavation with on- or off-site disposal is possible, if undertaken correctly, but this is an order of magnitude more expensive than herbicide-based control. Only glyphosate-based herbicides are effective for above ground control of knotweed growth in the UK. However, the rhizome frequently remains alive and ongoing vigilance for more than three years is required to ensure the success of any control treatment (Jones *et al.*, 2018).

Development of first true leaf on X *Reyllopia conollyana* one week after emergence. *Sophie Hocking*

Development of X *Reyllopia conollyana* one month post-emergence. *Sophie Hocking*

Perhaps most interestingly, *R. japonica* is widely distributed throughout the UK, despite being largely restricted to asexual (clonal) dispersal through direct expansion of rhizomes and via diaspores: primarily rhizome and stem fragments, but also leaves (Brabec & Pyšek, 2000; Bailey *et al.*, 2009; Akeroyd, 2014; Jones, 2015). This remarkable spread without viable seed production is made possible by anthropogenic and natural disturbance processes (e.g. riparian flooding), hastened by poor management practices and disposal of soil contaminated with rhizomes (both deliberate and inadvertent) (Dawson & Holland, 1999; Bailey *et al.*, 2009). Consequently, all *R. japonica* plants in the UK originate from a single female clone (Bailey, 2013).

In 2018, Jones *et al.* conducted the most comprehensive field-scale, Integrated Pest Management (IPM) assessment of *R. japonica* control methods. The largest of the three field trial sites, the Invasives Research Centre, is a 5ha site in Taff's Well, near Cardiff. Building upon this investigation, our research at Swansea University Department of Biosciences aims to assess: the longer-term ecological impacts of effective *R. japonica* control; secondary invasion processes by subdominant invasive plants, such as *Impatiens glandulifera* (Indian balsam), and, uniquely in Europe, habitat restoration approaches for ecologically degraded habitats previously dominated by invasive species.

Investigating the seed bank

To investigate passive and active habitat restoration, we evaluated the regeneration potential of the native flora seed bank present at the Taffs Well site. To achieve this, a seed bank study was established in February 2019 using soil samples collected using a metal auger (soil borer) from field trial plots. These plots had been subjected to above-ground *R. japonica* treatment. All samples collected were stored safely in sealed and labelled plastic bags.

Emergence of the seedling

In the Swansea University glasshouse facility, samples were split into three replicates, spread over seedling trays and grown under glasshouse conditions. Methods for this study were developed following Wagner *et al.* (2017), with advice from Wagner (pers. comm. 2018). After three weeks, an unidentified non-native knotweed plant was observed emerging with no visible rhizome material attached and the seed

case still present on the cotyledon, i.e., the plant had germinated from seed. This seedling was transplanted and grown on for the purposes of species-level identification (see photographs for development of the seedling). When the seedling had more fully developed to allow observation of leaf and stem features critical for species-level identification, images were shared with Dr Tim Rich and Dr John Bailey, who confirmed the identity of the plant as X *Reyllopia conollyana* (J.P. Bailey) Galasso (*Fallopia* × *conollyana)* (Conolly's Knotweed) (Stace, 2019). The parentage of this intergeneric hybrid involves *Reynoutria japonica* and *Fallopia baldschuanica* (Russian-vine).

History of a hybrid

Interestingly, X *Reyllopia conollyana* was first discovered in Wales in 1983 as an open-pollinated seed from *R. japonica*, almost 100 years after the first specimens of *R. japonica* were found growing in the wild in Maesteg (Wales). Shortly after the original find of X *Reyllopia conollyana* in 1983, another was found in Middlesex (Bailey, 2001).

Although most seed produced by *R. japonica* in the UK and Europe contains X *Reyllopia conollyana* embryos, only a very small fraction have been reported to germinate and successfully grow in the wild (Bailey & Spencer, 2003, Hoste *et al*., 2017). Past viability tests have yielded good results and germination rates are high under greenhouse conditions (Bailey, 2003; Tiébré *et al*., 2007, Hoste *et al*., 2017). It is consequently thought that germination success in the UK is primarily limited by a combination of mild winters and a characteristically underdeveloped endosperm that potentially increases susceptibility to attack by soil fungi (Bailey & Spencer, 2003). Furthermore, these hybrids are slow-growing and require bare ground for colonisation (Hoste *et al*., 2017). This is also evident from observations of *Reynoutria* species in their native ranges, where recruitment by seed is favoured when there is open ground, whereas vegetative reproduction is favoured when space is occupied by other vascular plant species (Bailey & Spencer, 2003).

The seedling found in soil from Taff's Well is thought to have originated from seed rain accumulated in the previous growing season and had survived the winter in the field. However, no further individuals of X *Reyllopia conollyana* or *Fallopia baldschuanica* have been identified growing at the site. Consequently, the presence of this hybrid knotweed in the seed bank provides an interesting opportunity to further understand the invasion dynamics of these knotweeds.

Certainly, as climate change continues to alter environmental conditions, occurrence of this hybrid may become more frequent in the future (Polgar *et al*., 2014). The effects this will have on invasive knotweed control are unknown, although as Bailey (2008) notes: 'Spread of such hybrid plants and the possibility of back-crossing recreating the missing hermaphrodite *F. japonica* var. *japonica*, are outcomes best avoided'.

More immediately, increasing incidence of X *Reyllopia conollyana* may create identification issues for those involved in knotweed remediation, whereby costly management operations are misdirected at what is believed to be *R. japonica*. Another potential impact of the hybrid may be through modification of the post-treatment seed bank, altering successional processes and passive recolonisation processes.

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Reynoutria japonica. Paul Sterry

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COUNTRY ROUNDUPS – ENGLAND

PETE STROH

I am drafting this note on the hottest day of the year so far, hiding from 38°C sunstroke-inducing temperatures, but there is no getting away from some pretty hot finds (quite pleased with that tenuous link) reported for the final Atlas summer field season. Before I begin the round-up proper though, as this is the last one before the end of fieldwork for the Atlas project, I wanted to use this space to thank again all contributors very much, and especially the Vice-county Recorders who not only go out and record, but also collate, validate, answer queries, run field meetings and identification workshops, put up with me, and so on!

Let's begin in Breckland, with the startling find of a new population of *Artemisia campestris* (Field Wormwood) by Tim Pankhurst and the Breckland Flora Group (BFG), who do such a wonderful job of monitoring the rare plants of the area. This Endangered species was found by Tim as he got out of his car at the small sandy car park in Icklingham, where many botanists stop so that they can wander over to 'the triangle' to try and find *Veronica verna* (Spring Speedwell) and other Breckland rarities. By the way, it was the best year I have ever known for the *Veronica*, and annuals in general seem to have done very well this year following last summer's heatwave and a mild winter. The *Artemisia* showed signs of having flowered last year, and the stature of the plant suggests that it has been present at the site for at least two years, perhaps longer. *Crassula tillaea* (Mossy Stonecrop) keeps the wormwood company in the car park, suggesting that much like the *Crassula*, the *Artemisia* may have established from the boots of a wandering botanist, or the wheels of a vehicle, although I suppose wind-blown seed cannot be entirely ruled out.

Many must have passed this plant on the way to seeking known treasure, and would surely have paid homage to the wormwood if they had known it was there – a cautionary tale, and one that shows the value of recording generally, in tandem with visiting sites to check on rarities in known locations. Thanks to Tim for not running over it when he arrived: excellent driving (and botanising) skills!

Staying in the area, and with a further nod to annuals, another BFG member, David Dines, found one of my favourite wild plants, *Melampyrum cristatum* (Crested

Artemisia campestris growing in a car park at Icklingham, Suffolk. *Jo Jones*

Cow-wheat), at a new site on a verge near to RAF Lakenheath. This is a species at serious risk owing to mis-management or neglect, and so it is great to know that it is not all doom and gloom for this most attractive of plants and that, like the wormwood, there remains hope that there are still sites to be discovered.

Perhaps not quite so obviously glamorous, but vanishingly rare throughout much of lowland England, is *Equisetum variegatum* (Variegated Horsetail). Remarkably, there have been three new locations for the species found this year, all in disused gravel pits. In County Durham, the horsetail was discovered by Martin Allen in open vegetation at Tees Valley Wildlife Trust nature reserve, near Stockton-on-Tees, and in Mid-west Yorkshire it was found by Kevin Walker in a rich drawdown zone over Magnesium Limestone, unintentionally created following extraction. The third site, at Yarwell Quarry, a private reserve in the north of Northamptonshire, was found by the indomitable Brian Laney, and is a first county record. Thanks are due to Ryan Clarke, who organised the field visit and clearly saw the site's potential. All three *Equisetum variegatum* records were confirmed by Fred Rumsey.

Continuing the theme of small but mighty, Roger Smith tells me that on a return visit with local botanists to a *Vicia orobus* (Wood Bitter-vetch) site discovered last year, the group were delighted to find lots of the Nationally Scarce *Carex montana* (Soft-leaved Sedge) in what is a completely new Devon location, and in much greater abundance than on Roborough Downs, previously thought to be the last known site in the county. The sedge is in the same community as the Wood Bitter-vetch, on a moist, south-facing slope above the River Dart. It is clearly a lovely site. And in Somerset, the Rare Plants Group discovered the equally diminutive *Carex humilis* (Dwarf Sedge) on steep chalk slopes at White Sheet Down SSSI. This Nationally Scarce species is included in the SSSI citation, but has previously only been recorded in the South Wiltshire (v.c.8) part of the SSSI and has never been known in this part of v.c.6, where it is recently recorded only from Brean Down, Crook Peak and the Avon Gorge.

Members of the Somerset Rare Plants Group studying *Carex humilis* (the sedge is the pale green plant at their feet). *Helena Crouch*

Staying in North Somerset, but upping the ante on aesthetics slightly, Andrew Robinson found the Vulnerable coastal perennial *Calystegia soldanella* (Sea Bindweed) at Sand Bay, near Weston-Super-Mare. Both Helena Crouch and Rob Randall have searched this area (in vain) many times in recent years, and feared that the species' distribution had dwindled to just one site in the county, at Berrow Dunes, where two patches are known on the golf course, so the find is great news and testament to the perseverance of wild flower recorders (and wild flowers). Thanks to Helena for all the North Somerset news. And just quickly to mention her excellent and ongoing online Rare Plant Register project – see http://www.somersetrareplantsgroup.org.uk/new-rare-plant-register – for more details.

Orchids have a knack of popping up in new locations, in part due to their strategy of producing tiny seeds that occasionally get carried long distances on updrafts and, very occasionally, find just the right place in which to settle. Ken Adams has written to tell me about a new site for *Himantoglossum hircinum* (Lizard

Orchid) in Essex, discovered by John Stowell while in his car sitting in a traffic jam. I can just imagine the double-take as John stared at the huge flowering spike. This is only the second record for the county in 100 years, following hot on the heels of its discovery in 2014. This orchid is likely to be one of the 'winners' when it comes to our changing climate, having already appeared in a number of new locations and counties over the past ten years. I wonder if the same might also be said for *Orchis militaris* (Military Orchid) in the years to come? Ian Denholm tells me the plant, so spectacularly found in Hertfordshire three years ago, has flowered again this year, and there are increasingly strong suspicions that it may have arrived via wind-borne seed from a wild population (as opposed to being planted by an 'enthusiast'), which would make the site the fourth native locality for this Nationally Rare and Vulnerable species.

Back down to earth, it is worth looking that bit closer at the paving cracks after news that Alan Wilmot has found *Galium murale* (Small Goosegrass) in Allestree, new to Derbyshire. Alan takes up the tale: 'I was on my way into the pub when I noticed what I at first thought to be *Sherardia arvensis* [Field Madder] and then my second record for *Galium parisiense* [Wall Bedstraw]. As I was late for my drink, I grabbed a piece. Next day, I found the material in my pocket and as I had the new version of Stace on my desk I ran it through his key for *Galium*. To my surprise, it keyed out as a plant I had never heard of.' The material was later confirmed by Eric Clement. There are very few records nationally for this Mediterranean species, almost certainly because it was included in Stace ed. 3 under 'other species', and only made it to the full key in the 4th edition this year. Although not perhaps a plant you would show to a friend to enthuse them about wild flowers, it is quite distinctive, with forward-pointing marginal prickles, as opposed to strongly recurved for *G. aparine* (Cleavers), less than four flowers per node, and much smaller (1.3–1.5mm) fruits than *G. aparine* (but larger than *G. parisiense*). Looking out for this could be a good opportunity to bag yourself a first county record.

In South Somerset, Simon Leach found another Mediterranean species with very few records for England, *Trifolium tomentosum* (Woolly Clover), on a scalped/mown and droughty road verge in Taunton, a first record for v.c.5, growing with *Torilis nodosa* (Knotted Hedge-parsley) and *Ranunculus parviflorus* (Small-flowered Buttercup). These two plants are having an especially good year on road verges in the county (and elsewhere), probably as a result of last year's hot dry summer. And, in Shropshire, *Pilosella* × *stolonifera*, the (surprisingly) uncommon hybrid between *Pilosella officinarum* (Mouse-ear-hawkweed) and *P. aurantiaca* (Fox-and-cubs), which boasts showy orange and yellow flowers, was found new to the county in a Shrewsbury churchyard by the eagle-eyed John Martin, who has recently moved to the area.

I was out recording in what appeared to be a very dull square in the far east of Leicestershire in early July when I stumbled across a very nice arable field with lots of lovely things, including abundant *Torilis nodosa* (which I see lots of in urban settings, but hardly at all in arable), *Anthemis cotula* (Stinking Chamomile), *Euphorbia exigua* (Dwarf Spurge) and a smattering of *Petroselinum segetum* (Corn Parsley). I was particularly pleased with the last find, as I hadn't seen it for many years, and even more so when I saw on our database that there were only two records for the county, and it was last recorded over 60 years ago. Cue email to Geoffrey Hall, followed by a response saying that he and Russell Parry had found it the week before on a disused airbase in the adjacent hectad. Fortunately, I'm not a competitive person (I am).

And, finally, returning to the *Galium* theme, in Surrey, Ann Sankey reports that a small patch of the Endangered *Galium pumilum* (Slender Bedstraw) was spotted by a very observant Mike Waite in some chalk grassland west of Dorking, growing amongst much *Asperula cynanchica* (Squinancywort). With so much flowering *Asperula* to distract Mike, I think 'very observant' is an understatement!

As ever, thanks to all for your marvellous recording efforts this summer, and please do let me know if you encounter something you want me to include for the January note.

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COUNTRY ROUNDUPS – SCOTLAND

IAN STRACHAN

In this final year of fieldwork for Atlas 2020, two week-long field meetings were held in Scotland, based at Whitebridge, in East Inverness-shire, and Dalmally, in Argyll. The first of these was attended by 20 botanists who collected an amazing 10,000 records in 80 monads (1km squares). Highlights included large, previously unknown populations of *Arctostaphylos alpinus* (Alpine Bearberry) on several tops in the south-west part of the Monadhliath Mountains, and two new sites for *Drymochloe sylvatica* [*Festuca altissima*] (Wood Fescue). This rather elusive grass species, which is largely restricted to woodland in humid gorges, was discovered on the east side of Loch Ness, below Knockie Lodge, and in Glen Tarff.

Also found on the east side of Loch Ness, growing under *Pteridium aquilinum* (Bracken), was a colony of more than 40 plants of *Ophioglossum vulgatum* (Adder's-tongue) – the first post-1999 county record for a species which is almost exclusively western in distribution in Scotland. *Sibthorpia europaea* (Cornish Moneywort) turned up in Glen Moriston, extending over rocky ground adjacent to a burn, in *Alnus glutinosa* (Alder) woodland. This is only the third Scottish site for this plant, which is native in the south-west of Britain and Ireland. This new population is assumed to be alien at this location, although growing in typical habitat for the species.

Notable finds from the Argyll meeting included several rather diminutive plants. New to the vice-county were *Crassula tillaea* (Mossy Stonecrop) in gravel, continuing its spread in Scotland, and, in short turf, two garden escapes, *Oxalis exilis* (Least Yellow-sorrel) and *Pratia pedunculata* (Blue Lawn-lobelia). Members also found Argyll's first inland sites for *Linum radiola* (Allseed) and *Medicago lupulina* (Black Medick) at the foot of Glen Strae and at Dalmally. Various species, such as *M. lupulina*, seem to be spreading into populated inland sites in this part of the Highlands, having been previously restricted to the coast. Another tiny coastal species, *Sagina maritima* (Sea Pearlwort), has increased enormously this year along roadsides in Badenoch and Strathspey, associated with the application of salt. Andy Amphlett reports that some populations extend for hundreds of metres along road verges. Last year, I noticed the same phenomenon for *Puccinellia distans* (Reflexed Saltmarsh-grass) in Lochaber.

During a BSBI weekend at Dunfermline, Marion Moir found *Catapodium rigidum* (Fern Grass), a scarce species north of the Lothians, on the coast at Kinghorn. Also close by, on basic volcanic rock, *Salvia verbenaca* (Wild Clary) was refound, close to its northern limit. Meanwhile, across the Forth the attractive *Festuca heterophylla* (Various-leaved Fescue) was found by a member of the East Lothian Botany Group in grounds near Winton House. This introduced ornamental species is occasionally naturalised on Scottish estates, but has few recent records here.

In mid-June, a small colony of *Primula scotica* (Scottish

Primula scotica on Hoy. *John Crossley*

Boreray from Hirta. *Ian Strachan*

Primrose) was found at Rackwick, on the island of Hoy, by Fraser Milne, an ecologist carrying out a contract survey. The site is 12km from the nearest known colony, on Orkney Mainland. This was a great surprise to Orkney recorder John Crossley, for the distribution of this species in Orkney was thought to be very well known, after decades of recording. Unlike all other currently known sites in Orkney, which are in maritime heath, the new site was in damp dune grassland on the edge of a dune slack. The population included a small number of plants in flower, and a great many seedlings. The vegetation was rich in vascular plant species, with 26 present in a 1m x 1m quadrat.

In late June, Dan Watson was part of an expedition to the NTS-owned St Kilda archipelago to help with a survey of burrow-nesting seabirds. The main island, Hirta, is relatively well botanised, so he took the opportunity to record on three less accessible islands – Boreray, Soay and Dun. The first of these is heavily grazed by unmanaged blackface sheep, left behind when the St Kildans evacuated Hirta in 1930; Soay is famously grazed by Soay sheep, whilst Dun is the only island of the four that is ungrazed.

On Boreray, the grazed areas are not very diverse, but a small patch of *Ophioglossum vulgatum* was a notable find. The cliffs have more luxuriant vegetation, with vigorous *Rumex obtusifolius* (Broad-leaved Dock) and *Silene uniflora* (Sea Campion) being most noticeable. Soay is even less often visited than Boreray, as the landing is far from straightforward. There seem to be very few botanical records, most being from the indefatigable Derek Ratcliffe, who visited in 1959. Grassy slopes and crags have a similar flora to that on Boreray, although with far more *Ficaria verna* (Lesser Celandine). The broad rounded summit of Cnoc Glas enables some heathland plants to flourish, including *Carex bigelowii* (Stiff Sedge).

On Dun, the absence of grazing allows tall vegetation to dominate in many places, with *Rumex acetosa* (Common Sorrel) and *Tripleurospermum maritimum* (Sea Mayweed). There are patches of maritime heath along the ridge of Bioda Mor, with *Armeria maritima* (Thrift) and *Plantago maritima* (Sea Plantain), the latter apparently strangely absent from Boreray and Soay. *Ligusticum scoticum* (Scots Lovage) also grows in a few places. Intriguing absences from the smaller islands compared to Hirta included ericaceous plants, e.g. *Calluna vulgaris* (Ling), which is common on Hirta despite heavy grazing, and *Euphrasia* species (eyebrights), which are also common on Hirta.

An outstanding recent publication is the *Isle of Bute Flora* by Angus Hannah, recorder for the Clyde Islands (see review page 70). The Flora includes one taxon new to science, the dandelion *Taraxacum chrysoglossum*, first discovered

Taraxacum chrysoglossum. *Sarah Cowan*

by the author in 2013 on Kilbride Hill. It was formally described earlier this year in the BSBI's new online journal *British & Irish Botany* (Richards, 2019). It has also been discovered in Tayside and Angus by Les Tucker, and in May was found by Angus Hannah on Arran.

Over the weekend of 19th-21st July, six botanists tackled a large gap in Atlas 2020 by visiting the remote central parts of the Cairngorms on the NTS Mar Lodge estate, in South Aberdeenshire. Fifteen tetrads in this area had no Atlas records since 2000, stretching from Braeriach, the UK's third highest mountain, south to the river Geldie, in upper Deeside, yet past records show the corries here hold many rare and interesting plants. Despite rather too much rain, low cloud and seriously bad midges, 18 monads were visited, filling many blanks in the distribution maps. A full report will appear in due course, but noteworthy finds included *Carex lachenalii* (Hare's-foot Sedge), *Alopecurus magellanicus* (Alpine Foxtail), *Phleum alpinum* (Alpine Cat's-tail) and *Veronica alpina* (Alpine Speedwell), as well as a scattering of montane willows.

If you would like to find out more about Scottish botanical discoveries of 2019, book your place now on the Scottish Botanists' Conference. As well as a great variety of interesting talks and workshops, a key feature is its excellent botanical exhibition. This year's conference will be held on Saturday 2nd November at the Royal Botanic Garden Edinburgh. Everyone is very welcome! Please see the enclosed flyer.

With thanks to Scotland Officer, Jim McIntosh, and fellow recorders for their contributions.

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COUNTRY ROUNDUPS – WALES CYMRU

BARBARA BROWN

During the spring and early summer, I organised and led a series of very successful training days for beginners, in partnership with local environmental record centres, the Elan Valley Links project, Montgomery Field society and Aberystwyth Conservation Volunteers. I have also worked with Radnorshire Wildlife Trust volunteers and Margaret Howell (Aberystwyth University) to survey Gilfach's hay meadow, participated in the Llanwrthwl and Bryn Parc Bach bioblitzes, and led a series of summer evening and day recording sessions, looking at under-recorded monads in mid Wales. I also ran a BSBI stall at the National Botanic Gardens of Wales for their Wildflower Weekend.

The Wales Annual Meeting ran from 21st to 23rd of May and was based in the Stradley Hotel in Llanelli. Blessed with ideal botanising weather, the meeting offered a chance to explore a variety of interesting sites. Richard and Kath Pyrce organised the meeting and the excellent programme they put together included Burry Port Harbour on the first day, featuring *Silene gallica* (Small-flowered Catchfly), *S. conica* (Sand Catchfly) and *Linaria supina* (Prostrate Toadflax). The following day took us to Capel Dyddgen, a delightful series of meadows, some with calcareous soils, others with acid, variously dry or marshy, and all enclosed by woodlands and thick hedges. The group saw *Geranium columbinum* (Long-stalked Crane's-bill) and *Carum verticillatum* (Whorled Caraway), as well as a few lucky sightings of Marsh Fritillary butterflies. The last day paid homage to the flora of Pembrey Burrows, with its *Thalictrum flavum*, (Common Meadow-rue), *Ranunculus lingua* (Greater Spearwort), *Botrychium lunaria* (Moonwort) and *Anacamptis morio* (Green-winged Orchid).

Other national events included a well-attended visit on 1st June

Looking for *Callitriche* at the workshop in June. *Barbara Brown*

to view the summer botanical highlights of Stanner Rocks, led by Andy Jones, followed on 22nd June by an examination of *Callitriche* (water-starwort) species from specimens and also fresh samples collected at Llangors Lake. This workshop was expertly led by Richard Lansdown.

County round ups

The report from **Radnorshire** emphasises the importance of the recent #nomow campaign on social media. Liz Dean and Sue Spencer visited Presteigne on 6th July to check a possible report of *Anacamptis pyramidalis* (Pyramidal Orchid), as it was a potential first record for the vice county. However, on arriving at the area, they found it had been mowed the previous day. Luckily, enough remains were found to confirm the sighting.

Notable records in **Brecknock** include a find of *Orobanche rapum-genistae* (Greater Broomrape) which is nationally rare and declining in v.c.42. This broomrape depends on *Cytisus scoparius* (Broom) and *Ulex europaeus* (Gorse) and may be under-recorded. Perhaps the latter plant's prickly understorey is discouraging recorders from foraging there – this is easily understood by anyone who has had to brushcut a stand! The Brecknock group also tracked down a record of *Hymenophyllum wilsonii* (Wilson's Filmy-fern) near Abergwesyn Common, and they have recently found *Galeopsis bifida* (Bifid Hemp-nettle) at Gors Llwyn, which is a first for that hectad.

Enjoying a break at the recording day at Cwm Belan, Montgomeryshire. *Barbara Brown*

The Anglesey Flora Group organised an intensive recording session in early April to bring everyone together at the start of the recording season. Twenty people participated and six monads were visited. Highlights included good numbers of *Viola hirta* (Hairy Violet) at Glyn, *Scilla verna* (Spring Squill) at Ynys Gaint, which is remarkable as it is scarce in the Menai Straits, and good numbers of *Polystichum aculeatum* (Hard Shield-fern), plus *P.* x *bicknellii* at Plas Cadnant.

The flora group has been out regularly since then and you can catch up with its latest finds on @Angleseyflora, including new records for *Epipactis dunensis* (Dune Helleborine) at Aberffraw and in monad SH4564 in both June and July.

In Caernarvonshire, another notable orchid, *Cephalanthera longifolia* (Narrow-leaved Helleborine), was recorded at sites around Llwyndrys and

Fachwen by both the recording group and Robbie Blackwell Miles. A new site for *Hypericum linariifolium* (Toadflax-leaved St John's-wort) has also been found at its traditional haunt near Pwllhelli.

In early June, Joshua Sykes found *Carduus acanthoides* (Broad-winged Thistle) near Wrexham, **Denbighshire**, a first for Wales. In the same month, the Denbighshire group also found a new tetrad record for *Fumaria purpurea* (Purple Ramping-fumitory) at Kimmel Bay and a new location for *Senecio cambrensis* (Welsh Groundsel) near Chirk, as well as *Marrubium vulgare* (White Horehound) in May on a visit to Rhyd y Meudwy. Here they also found *Ranunculus parviflorus* (Small-flowered Buttercup), which has not been recorded in Denbighshire since 2004 (and previous to this 1844). *Platanthera bifolia* (Lesser Butterfly-orchid) was also found in June near Abergele in a new area.

The **Montgomeryshire** intensive field days took place between 18th and 20th June and focused on the area around Llandinam, Carno and Foel. Volunteer teams took on under-recorded monads and over 2,000 records were made. A personal highlight was discovering that a few *Vicia orobus* (Wood Bitter-vetch) plants had narrowly escaped their verge being cut back to a rock wall near Cefn Coch. Other significant records from general atlas surveying included *Potentilla argentea* (Hoary Cinquefoil) near Old Churchstoke, in April.

In **Monmouthshire** one of the most exciting finds was six plants of *Turritis glabra* (Tower Mustard). Considered to be extinct in Wales, it appeared on a farm near Llangovan, next to a new track. The ballast for the track came from Clearwell quarries, in Gloucestershire, but there are no records for this species there, so the origin of the seed is a mystery. Monmouthshire seems to continue to buck the national trend for the arable weeds *Spergula arvensis* (Corn Spurrey) and *Stachys arvensis* (Field Woundwort), as there are a few new records for these species this year, adding to their existing widespread distribution in the county. *Mentha arvensis* (Corn Mint) similarly continues to be found in new sites. Checking out old records for *Oenanthe aquatica* (Fine-leaved Water-dropwort), it appears that most of the original ponds have become overgrown and, in many cases, the plant has been lost, but a new site with a healthy population has recently been found near Kingcoed. 'Garden escapes' continue to naturalise in the countryside, with county firsts for *Nonea lutea* (Yellow Monkswort), *Libertia formosa* (Chilean-iris) and *Acorus gramineus* (Slender Sweet-flag) this year. The Monmouthshire recording group has also found a new inland site for *Oxybasis [Chenopodium] glaucum* (Oak-leaved Goosefoot). This was a new hectad record.

The Merionydd Naturalists found *Amsinckia micrantha* (Common Fiddleneck) on a sandy waste tip in April, near Aberdyfi. This field day also yielded a find of *Schedonorus giganteus* (Giant Fescue). Another field day in May discovered a new site

Amsinckia micrantha.
Barbara Brown

for *Galium boreale* (Northern Bedstraw) in Foel Cynfal. *Logfia minima* (Small Cudweed) was found near Llandecwyn Station and *Gymnocarpium dryopteris* (Oak Fern) at Craig yr Aderyn in June. Arable weeds featured in July, as *Lepidium didymum* (Lesser Swine-cress) was found, along with *Papaver dubium* (Long-headed Poppy) and *Rumex* x *dufftii* (a hybrid dock) at Tan y Garth. Their busy recording season is currently reaching its zenith at the Caerdeon residential meeting – but a report on new records for this will have to wait until the next roundup.

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COUNTRY ROUNDUPS – IRELAND

SARAH PIERCE

It has been a busy season for BSBI in Ireland, full of big changes, big projects, rare plants, and exciting sites. Since the last *BSBI News*, Ireland Officer Maria Long has left to join the National Parks and Wildlife Service (NPWS). Maria was Officer for over seven years, helping BSBI to grow to over 200 members in Ireland, organising training sessions, recording days and conferences, surveying rare plants, developing new projects, and supporting our volunteers. Thanks for all your great work over the years, Maria, and we look forward to continuing to work with you in your new role and as a BSBI member.

I took over from Maria in June, in the midst of a busy field season, so it has been all go from the start. One of the first things I started working on was a big project, and I don't mean Atlas 2020. Thanks to funding from NPWS (RoI) and CEDaR (NI), we have been running a big Aquatic Plant Project. Managed by Paul Green, the project has included more than 20 days of training and recording to help improve aquatic plant identification skills and increase recording of aquatic plants. The project kicked off in June with a day of training at Lavistown Study Centre, Co. Kilkenny, led by Lynda Weekes, and a day at Cleggan, Co. Galway, with Cillian Roden, where participants could see nearly all the aquatic plants present in Ireland. This was followed by nine days of field training and recording across the north-west in July, and another nine days in the Midlands in August, both led by Nick Stewart. So far, the project has provided aquatic plant identification training for around 75 people, while also collecting hundreds of new aquatics records across 11 counties. In September, the Aquatic Plant Project will be moving to Northern Ireland, with even more training and recording days. Check the webpage for more information: bsbi.org/aquatic-plant-project.

Aquatic Plant Project training day with Lynda Weekes at Lavistown Study Centre. *Mark McCorry*

It was not all about aquatics this summer. As usual, the Rough Crew have been out exploring some of our more hard-to-reach natural places and finding some exciting plants in the process. On a particularly fruitful (and damp) trip to Hungry Hill, Beara, Co. Cork, they found *Saxifraga stellaris* (Starry Saxifrage), which had not been recorded in the county for 125 years, as well as the first record of the Nationally Scarce *Phegopteris connectilis* (Beech Fern) for Beara. Robert Northridge and John Faulkner had their own unofficial Rough Crew trip to the most northerly land in Ireland: the remote island of Inishtrahull, Co. Donegal. There they found the tiny *Ophioglossum azoricum* (Small Adder's-tongue), which was last seen on Inishtrahull in 1940, and added a total of 18 species to the island's list. Rory Hodd also reported that a trip to relocate *Cryptogramma crispa* (Parsley Fern) at Slieve Foye, Co. Louth, one of only two sites where it has recently been seen in the Republic of Ireland, was successful. Many other useful records were made while up the

mountain, including *Oreopteris limbosperma* (Lemon-scented Fern), which had surprisingly not been seen in Co. Louth since 1887.

As recorders are scouring the country to get as many species as possible for Atlas 2020, a number of other rare finds have cropped up. Wet knees and muddy boots were rewarded as *Hammarbya paludosa* (Bog Orchid) was re-found in at least three sites: on John's Hill, Co. Carlow by Ciarán Byrne, near Coomasaharn Lake, Co. Kerry, by John Diggin, and in the Cooley Mountains, Co. Louth, by Cliona Byrne. Cliona Byrne and Kate Harrington also found *Diphasiastrum alpinum* (Alpine Clubmoss) in the Cooley Mountains. Meanwhile, Paul Green recorded over 80 plants of *Matthiola sinuata* (Sea Stock) on the face of a dune at Morriscastle, Co. Wexford. Paul reports that, according to the *Ireland Red List: Vascular Plants*, *Matthiola* has been extinct in Co. Wexford since 1925, with the last confirmed Irish record from Co. Clare in 1933. Contrary to the published records, a number of botanists have come forward to say they saw *Matthiola* in Co. Wexford in the 1970s.

Hammarbya paludosa from John's Hill, Co. Carlow. *Ciarán Byrne*

If you want to hear more about Rough Crew outings, rare plant sightings, BSBI projects, and other news in Irish botany, join us for the Irish Autumn Meeting and AGM. It will be held at the National Botanic Gardens, Dublin, on Saturday 21st September. You can find all the details and booking information at bsbi.org/irish-autumn-meeting-agm. We also now have an email list to share news specifically relevant to Irish members. If you would like to be added to the list, please contact me (sarah.pierce@bsbi.org).

I could not let this opportunity go by without at least a mention of the great progress for Atlas 2020. As of July, we had 96% of hectads (969 out of 1,009 total) with greater than 60% of species re-recorded since the last atlas, and this number has certainly increased since then. This represents an tremendous effort by all the volunteer recorders, and for that we are hugely grateful! We are now in the very final push and need all records to be submitted by 31st December for inclusion in Atlas 2020. For VCRs who would like a bit of help with validation, we will be holding a VCR day at the National Botanic Gardens on Saturday 9th November. Keep an eye on your email and the BSBI Ireland webpage (bsbi.org/Ireland) for more details.

Finally, a bit excitement from a new BSBI Ireland member.

Epipactis dunensis from Dublin. *Gonçalo Santo*

Gonçalo Santo recently moved to Ireland from Portugal and has been eagerly exploring the local flora. While botanising in Dublin, he found what he originally thought was *Epipactis helleborine* (Broad-leaved Helleborine), but which was later identified by Mike Waller to be *E. dunensis* (Dune Helleborine). This identification was confirmed by Mark Lynes. *E. dunensis* has never been recorded in Ireland before and is considered endemic to Britain, though Mark reports that there was a previous unconfirmed claim of it in Dublin many years ago. Well done, Gonçalo!

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OBITUARIES

WILLIAM ALDRED THOMPSON (1936–2019)

Bill Thompson, who died on 23rd January 2019, had been a BSBI member for 37 years. He was born in Edinburgh on 14th March 1936. His father was teaching at a school in Biggar at the time and Bill remained in Edinburgh until the outbreak of World War II, before spending the war years with his mother in Preston. After the war the family moved to Devon, where his father took up a teaching post in Exeter. Bill attended Hele's School, eventually being awarded an open scholarship to read Classics at New College, Oxford. After completing his national service in the RAF he went to Oxford in 1957, eventually attaining his degree in 1961. His interest in botany began during his university years. It all started when he was walking on Woodbury Common, in Devon, where he attempted to identify some of the plants.

After leaving university, Bill joined the Health Service as a graduate Trainee Administrator with the Manchester Regional Health Authority. His first appointment was in Preston, after which he moved to the Black Country in 1969, where he took up a position with the Dudley Area Health Authority. He was elected to the Institute of Health Service Administrators in 1972, achieving honours in the final examination. He spent the rest of his working life with the Authority, retiring as deputy group secretary in 1996.

During his time in the Midlands, Bill became an important contributor to four regional Floras. He contributed some 2,500 records for the *Ecological Flora of the Shropshire Region* (1985), mainly in the Bridgnorth and Ironbridge districts, but also found a number of rarities on old coal-mining waste heaps in Telford and along the Severn Valley Railway. Having made a close study of the regional hawkweeds (*Hieracium* species) he was the main contributor of such records from 1975 onwards. Subsequently, he was involved in recording in Montgomeryshire. *The Flora of Montgomeryshire* was published in 1995 and he and Peter Benoit were acknowledged as the two mainstays of the project from the outset, without whom the work could not have been produced. Bill provided records for a part hectad, and with Jim Bevan wrote the hawkweed section, but more importantly set up an expert filing system to store details of the rarer plants of the vice-county, leaving an excellent database for the current status and history of these species.

In 1987, Bill joined the Worcestershire Flora Project, set up in that year with the intention of producing a new county flora. Bill initially took on the roll of coordinator and recorder for some of the northern hectads, although later on he made visits to several other hectads where the recording effort had somewhat diminished. The northern hectads included parts of the Black Country and south Birmingham district, all of which required a great deal of urban recording. It soon became apparent to me what an excellent all-round field botanist Bill was; his wide knowledge of alien plants, in particular, meant that there were many new county records for species so often conveniently ignored by average botanists.

In 2001, Bill and his wife Norma moved to Whaley Bridge in Derbyshire, and between 2001 and 2003 he contributed some 1,100 records for the north-west of the county around Whaley Bridge and Chapel-en-le-Frith. His move to Derbyshire meant that his input during the latter years of the Worcestershire project was rather limited. Nevertheless, for *The Flora of Worcestershire* (2014) he provided at least 30,000 records, and made a major contribution to the hawkweed and alien species accounts. I benefited greatly from his help, advice and knowledge throughout the project. In addition, the authors of the *Flora of Birmingham and the Black Country* (2013) had access to his v.c.37 records for the north of the county, many of which were the only records for some difficult and critical species which otherwise would not have been included. He also wrote the hawkweed section, and the fine collection of the regional hawkweeds he amassed is now housed in the National Museum of Wales.

Apart from botany, Bill also had a love of hill-walking, which had been nurtured during family holidays to the Highlands of Scotland, where he and his father spent days in the hills, and, with Norma, many hours were spent in the Brecon Beacons, Black Mountains and Snowdonia. He also eventually managed to find time to reach the highest point in each

of the English counties. However, his favourite walks were in the Lake District, and he requested that his ashes should be scattered on a Lake District summit of the family's choice. He also had a keen interest in football, initially as a supporter of Preston North End, at that time in the top flight, but latterly his interest was with non-league clubs, always watching the local team.

In 2006, Bill and Norma finally settled in Kirkbymoorside, in North-east Yorkshire, where he continued recording, producing many records, especially from the south of the county. He had been planning to write a local Flora for the Hambleton AONB, which now sadly will not happen.

I enjoyed many hours with Bill, discussing botany, determining voucher specimens and especially field recording, each session usually ending up with some refreshment in the local pub. I will remember him as a modest and courteous man, very conscientious and thorough in all he did, and also having a wry and cheeky sense of humour. When he moved away from Worcestershire he was a great loss to the county's botanical scene.

Bill is survived by his wife Norma, two sons, a grandson and granddaughter. I am grateful to Norma for providing me with information about his early years and career, and to the botanists who provided details of his botanical contributions before and after his time in Worcestershire.

Roger Maskew

JEFFREY JAMES WOOD (1952–2019)

Jeffrey Wood was one of the foremost orchid taxonomists of his generation. His knowledge of the orchids of tropical Asia was unsurpassed and he was a prolific author of authoritative accounts of the orchids of the region.

Jeffrey's fascination with plants can be traced back to his childhood. He was born in Bournemouth on 28th November 1952 and, as an only child, he developed a passion for gardening and had an excellent knowledge of garden plants and also of the native British flora. With this background, his choice of career was clearly preordained and, on leaving school at 18, Jeffrey immediately joined the staff of the Natural History Museum. A year later he transferred to the staff of the Royal Botanic Gardens, Kew, as assistant scientific officer in the Orchid Herbarium, where he remained for the rest of his working life. He initially worked for Peter Hunt (1971), then Peter Taylor (1972–1985) and finally for me (1985–2006), eventually succeeding me as the sixth curator of the orchid herbarium until his retirement in 2012.

Jeffrey's knowledge of tropical Asiatic orchids was encouraged early in his career by Eric Holttum, formerly Director of the Singapore Botanic Garden and Professor at the University of Singapore before his retirement to Kew. He could not have chosen a better teacher because Holttum was the author of an authoritative account of the *Orchids of Malaya* (1953) and, with Eric Laycock, co-founded the Singapore orchid industry by hybridising native species and introducing modern propagation methods to the region.

In 1976, Jeffrey joined Martin Sands, a senior colleague, on a tough three-month expedition to Manus Island and New Ireland in Papua New Guinea. The fine collections from these remote and previously almost unexplored islands now grace the Kew Herbarium. They include many novelties, a number of which were described as new to science by Jeffrey. Later expeditions, in Sumatra with Jim Comber and in Borneo with Tony Lamb, enhanced his already substantial knowledge of the orchids of the region. He worked closely with Gunnar Seidenfaden, the eminent Danish diplomat and botanist, and collaborated with him on the substantial *The Orchids of Peninsula Malaysia and Singapore* (1992).

On his visits to Sabah, he met the naturalist and publisher Chan Chew Lun who became a close friend and supported Jeffrey's work for many years. He also began a lengthy collaboration with Tony Lamb and Professor John Beaman, then seconded from his university in Michigan to the university in Kota Kinabalu. These collaborations led to numerous authoritative and often magnificently illustrated accounts of the orchids of south-east Asia, including *The Orchids of Sarawak* (2001) and *The Orchids of Mount*

Jeffrey Wood. *Chan Chew Lun*

Kinabalu (2011). For further details of these and other major publications, see *Orchid Research Newsletter* 74 (2019).

For four or five years between 1971 and 1976, Jeffrey wardened the only known British site for *Cypripedium calceolus* (Lady's-slipper). It was a lonely job, camping in a damp hollow, but it did improve his knowledge of the local flora. His interest in British, European and Mediterranean orchids continued throughout his Kew career, sustained by annual holidays in France and elsewhere in the Mediterranean, where he could indulge his passion for plants and plant-hunting. For many years, he was the BSBI orchid referee, identifying members' discoveries, answering queries and hosting some members at Kew, notably Derek Turner Ettlinger and David Lang. His knowledge of the European orchid flora encouraged Desmond Meikle, a senior colleague, to ask Jeffrey to write the orchid account for his *Flora of Cyprus* (1977, 1985). His treatment of Cypriot orchids remains the most authoritative, despite the many subsequent accounts of this rich assemblage of orchids on an island where recognising dozens of micro-species has become a major hobby.

Jeffrey retired to Bristol in 2012 to follow his passion for gardening and travel, albeit far too briefly. His occasional trips to London were to meet up with his old friends from south-east Asia, when they visited Kew, and with former colleagues. He died unexpectedly on 2nd February 2019 from complications following a flu-like infection. His contribution to our knowledge of Asiatic orchids has been substantial and he will be sorely missed by his friends and colleagues.

Phillip Cribb

OBITUARY NOTES

Since we compiled the last Obituary Notes, news has reached us of the death of the following members or former members. We send our sympathy to all their families and friends. We hope that it will be possible to publish obituaries of Alan Hill, John Mitchell, John Palmer and Bruno Ryves in future issues of *BSBI News*, although we have only just received news of some of the deaths, and in these cases arrangements have not yet been finalised.

Dr G.C.G. Argent of the Royal Botanic Garden, Edinburgh, a member for 54 years. For obituaries of George Argent see *The Scotsman* (21st May 2019), *The Times* (23rd May 2019) and *The Herald* (31st May 2019). His work on the tropical 'Vireya' Rhododendrons of south-east Asia culminated in the second edition of his monograph *Rhododendrons of subgenus* Vireya (2015).

Mr R. D. Brearley of Bridgwater, a member for 33 years.

Mr C.I. Gillings of Scarborough, a member for 16 years.

Mr A.G. Hill of Holywood, Co. Down, a member for 33 years.

Dr E.A. Howe of Benllech, a BSBI member for ten years. Liz Howe had worked for National Resources Wales and its predecessors NCC and CCW for over 30 years. Although primarily a herpetologist, she was involved in commissioning or supporting major habitat surveys and botanical projects and she gained the

deep respect of Welsh botanists for the commitment with which she advocated conservation and the effectiveness of her work within these organisations. I (CDP) remember with gratitude her support when she represented CCW on the Steering Group for the BSBI 'Atlas 2000' project. An obituary of Liz was published by *The Guardian* (5th May 2019) and she was commemorated on Radio 4's *Last Word* programme (12th May 2019), a rare accolade for a BSBI member. The BSBI's *Welsh Bulletin* no. 104 (2019) includes a tribute to Liz.

Mrs V. Lawson of King's Lynn, a member for nine years.

Mr J. Mitchell of Drymen, a member for 25 years.

Mr J.R. Palmer of Dartford, a member between 1965 and 2009.

Mr K. Pyne of Hereford, a member for 26 years.

Mr T.B. Ryves of Kingston Hill, Surrey, a member between 1990 and 2018.

Mr C.R. Stevenson of King's Lynn, a member for ten years. Robin was co-author with Frances Schumann of *A Flora of King's Lynn* (2011), although he was better known for his bryological studies.

Prof. D.H.W. Walton of Bluntisham, a member for 52 years. David Walton spent his career with the British Antarctic Survey and his work as an Antarctic ecologist received worldwide recognition.

We reported the death of **Dr S.M. Eden** in the last Obituary Notes. David Pearman writes: Sue Eden, née Coles, died in Dorchester on 30th October 2018, aged 75. She was born on 1st June 1943 near Rugby, in Warwickshire, where, after attending the local Grammar School, she went to Leicester University. She did her Ph.D. there on variation in *Ranunculus acris*, *R. bulbosus* and *R. repens* and published three papers in *Watsonia* 8 (1971), 9 (1973) and 11 (1977). After gaining her doctorate she worked at NCC/ITE Colney Research Station, near Norwich, where she studied the ecology of saltmarshes in the area of the Wash, specialising in benthic microalgal populations on intertidal sediments and their role as precursors to saltmarsh development. She was an editor of *Watsonia* between 1978 and 1985. She led botanical tours to the Mediterranean in the 1970s, and collected seeds of legumes and others, some of which I am still growing in my garden 40 years on! She moved to Dorset in 1988, and whilst still interested in botany, became an expert on dormice, and was one of the first to note their persistence in hedgerows and bramble scrub, well away from woodlands, which had been long held to be their preferred habitat. She published her research in 2009 as a book, *Living with Dormice*.

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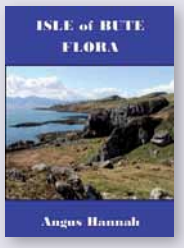
REVIEWS



Isle of Bute Flora

Angus Hannah
Trollius Publications, 2019
360pp. £30 pbk
ISBN 978-0-9539718-8-6

The Isle of Bute lies to the west of Glasgow, in the Firth of Clyde, separated from Argyll by the narrow Kyles of Bute. It forms part of the Clyde Isles vice-county (v.c.100), along with Arran and the two Cumbraes. Arran is an island well known to botanists, especially for its endemic whitebeams, whereas Bute had been rather little explored prior to the work on which this new Flora is based. Angus Hannah has spent 20 years studying the island's plant life and has written a most interesting and stimulating book – the first Flora for Bute, together with its much smaller neighbour, Inchmarnock.

Bute has few notable rarities, but its wide range of habitats supports a surprising diversity of vascular plants. The Flora covers 1,039 taxa, including 949 species recorded since 2000, which is a remarkable number for a relatively small island. Bute is just 15 miles long by 4 miles wide, with an area of about 120km^2. Half of this is devoted to intensive farming and the highest point is only 278m altitude, making the diversity of species all the more remarkable.

The Flora has many outstanding and unusual features, based on detailed recording and analysis, including repeat visits to all 161 monads (1km squares) on the island. It begins with a very readable account of the geology, climate, landscape and settlement history of Bute. The Highland Boundary Fault cuts across the middle of the island and is a major factor in its diversity. There follows a lengthy section entitled 'A botanical tour of Bute', combining descriptions of habitats with places of interest, and a chapter on the history of botanical recording. One the most interesting parts of the Flora describes how the data were collected and analysed, including some novel and thought-provoking approaches.

The species accounts are carefully written and contain much of interest on distribution and ecology. As so often with modern floras, one has to keep referring to the beginning of the catalogue (and earlier text) to understand terms and abbreviations, particularly if 'dipping in' to read about a particular species, but this is a consequence of fitting so much information into a reasonably concise format. Even so, the accounts are very readable. It is also worth getting to grips with the various indices that the author has used to inform his commentaries.

For the 530 commonest species, the accounts include lists of the most frequently associated plants, based on numerous quadrat records collected by the author. Using the same data, local Ellenberg values (which help to define ecological niches) have also been calculated for each of these species and compared to the national values, with comments on significant differences. Clear monad distribution maps are given for all but the scarcest species, with a special feature being an indication of abundance, using a three-point scale. Despite the difficulties associated with such estimates, which are freely discussed by the author, this does add an extra dimension to the maps.

Of the critical groups, *Rubus* (brambles) and *Taraxacum* (dandelions) have received particular attention. The Flora includes one taxon new to science, the dandelion *Taraxacum chrysoglossum*, first discovered by the author in 2013 on Kilbride Hill (although subsequently found in Tayside and Angus, and in 2019 on Arran – see page 60).
The Flora concludes with a series of short appendices covering a variety of topics, from a list of probable extinctions to a fascinating account of Bute's non-native species. The most extraordinary of the latter is surely *Hypolepis ambigua* (New Zealand Pig-fern), a relative of *Pteridium aquilinum* (Bracken), discovered in 2016 to be well-established on Bute, but unknown elsewhere in the wild in Britain and Ireland, and possibly the Northern Hemisphere.

The layout is attractive, with very few errors. The book is well illustrated, with landscape photographs to characterise

the range of habitats (although some are rather dark), but there are disappointingly few species images, although the need for these in a Flora is perhaps debatable. I would have liked to read more about conservation status and site protection, although a Rare Plant Register for Bute can be downloaded from the Clyde Isles page of the BSBI website, where corrections and updates will also be made available.

In conclusion, this is a worthy addition to the growing list of local Floras, with much to interest botanists in Scotland and beyond.

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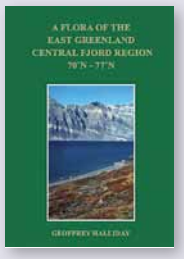


A Flora of the East Greenland Central Fjord Region

Geoffrey Halliday, with assistance from Rod Corner
Trollius Publications, 2019
280pp, 100 plates and dot distribution maps of 245 species.
£28 pbk
ISBN 978-0-9539718-7-9

I have long harboured an ambition to visit Greenland, both to climb (when I was very much younger!) and later as a botanist. Neither ambition has ever been realised. Geoffrey Halliday has visited the central fjord region a number of times, sometimes in the company of Rod Corner and Hugh Lang, both well-kent faces for those of us of a certain age and redoubtable botanists (the book has an fine picture of the three of them in grizzled, arctic explorer mode). However, this excellent book is not a personal account, but the drawing together of botanical data from some 150 expeditions to the area from Scoresby's original 1822 exploration up to 2015, a prodigious task and clearly a labour of love.

The fjord region of the Greenland east coast is reputedly one of the most beautiful places on earth and the bulk of the area described in this flora is within the North East Greenland National Park, the largest in the world. The scale is impressive, over 750km from north to south and with the head of the longest fjord some 300km from the open sea, and much of it is alpine in nature. Added to this scale are the problems of the short season and of access which is only really practicable by sea or air, both of which are subject to the vagaries of pack-ice and the inhospitable nature of much of the coastline. Given these constraints, getting to grips with the flora of the area is always going to be an adventure.

The flora has a traditional layout, with an introductory section on the geology, geomorphology, glacial history and climate, and longer sections on the vegetation and history of recording. The bulk of the book contains the species accounts and maps. The climate is obviously a vital factor in the arctic flora (and a limiting factor for botanists) as the growing season is so short. The low annual precipitation is not a surprise, but just how dry at 200mm per year at some stations is impressive. Given this dry climate, the differential accumulation of snow and its persistence, and crucially the moisture provided by its melting is critical. This is clear from the description of the various types of vegetation. There is also a chapter on the origins of the flora, again exercising the arguments over periglacial survival and post-glacial colonisation, here perhaps enlightened by the limited distribution of many of the species and by recent molecular data on more widely distributed species.

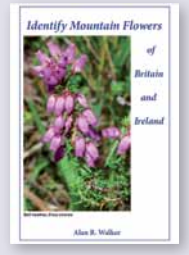
The history of the botanical exploration of the area is of necessity a history of the various expeditions and must hide many stories and many characters that could probably fill a book on their own. From 1962 to 1996 the Greenland Botanical Survey, based in Copenhagen, made regular visits, and the author claims that this is now one of the better-recorded areas of the arctic. Certainly, the number and spread of records of the common species is remarkable. There is a lament in the conclusion that this productive era is now at an end as access to the National Park is more restricted, apparently because of the threat from Polar Bears, and because this kind of research is no longer popular at academic institutions – the latter a familiar tale.

The extreme conditions mean that the flora is quite limited, with some 240 species. The species accounts have a description of the distribution, the favoured

habitats, the northern limit in Greenland, altitudinal limit, biogeographic affinities and sometime some taxonomic notes. The sequence of families follows the 3rd edition of Stace and the taxonomy largely follows that of the *Flora of North America*. The species accounts contain many genera and a fair number of species that will be familiar to British botanists, reminding us yet again of the affinity of the Scottish hills with the arctic. The National Park's central position in Greenland means that the area is the southern limit of some high arctic species and the northern limit of some low arctic ones, as well as having a few species such as *Draba sibirica* and the beautiful *Polemonium boreale*, which have their only Greenland sites here, and *Saxifraga nathorstii*, which is endemic to this area.

It would be interesting to know if there is a database of the records from which the maps are compiled as this could possibly be of more practical use when planning an expedition than the maps themselves, which really only show a pattern of distribution. The reproduction of the photographs is a little disappointing, but presumably most date from before the era of digital cameras. There is only incidental mention of climate change, but, as is pointed out in the concluding remarks, the data contained here provide a baseline against which to measure the effect that the changing climate has on the flora, and for that reason alone this is an important book.

Gordon Rothero
gprothero@aol.com

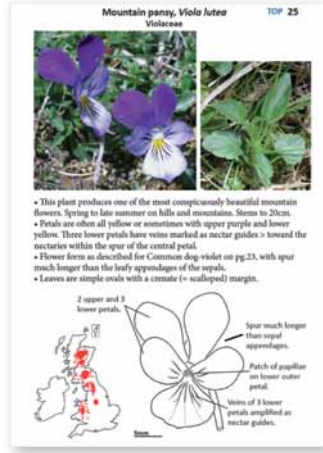


Identify Mountain Flowers of Britain and Ireland

Alan R. Walker
Self-published, 2019
116pp. Free as a pdf from www.alanrwalker.com/mountain-flowers/
ISBN 0-9545173-3-4

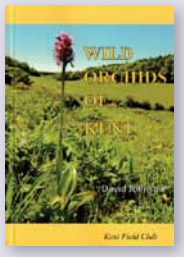
This is an interesting attempt at providing a simple guide to the commoner species of flowering herbs and shrubs likely to be seen by a casual rambler on British moors, hills and mountains. Many of the species included are perhaps surprising as they are also common lowland species (e.g. buttercups and mouse-ears) but all do occur in the hills. Altogether, Alan Walker provides descriptions of 104 species, each on an A5 size page. The species selection is very much aimed at the casual visitor to the hills who may have little botanical knowledge and it therefore omits most rarities (except for a few such as Alpine Saxifrage) and any mention of subspecies; this will restrict its interest for more serious botanists. Given this audience, some of the botanical terminology used may be a little advanced, with words like 'corymb' occurring without a clear explanation. Nevertheless, in general, the text is very clear with most words used being well illustrated in the line-drawings.

The booklet is up-to-date, using the nomenclature of Stace 4 (2019), though the only index is by English names. The lack of the earlier Latin names may be confusing to those who only have older floras. Unfortunately, in spite of the title, there is no actual key to aid the identification of the species included, but the range of species chosen is not so great as to preclude one scrolling through the pdf version to identify any finds. An advantage is that the pdf file is not very large (only 28.2 MB) so can easily be downloaded to a tablet or smart phone for use in the field.



The strengths of this booklet include the almost universally excellent and clear photographs, and the outstanding clear line-drawings and descriptions of key identification points. The distribution maps, derived from BSBI maps, are also useful. I have very few quibbles about the presentation of the species chosen, though would, perhaps, have liked to see a picture of a yellow *Viola lutea*!

Lyn Jones
joneshamlyn@gmail.com



Wild Orchids of Kent

David Johnson
Kent Field Club, 2019
225pp.pbk
£17 (incl. p&p) from Kent Field Club online at www.kentfieldclub.org.uk
ISBN 978-0-9561926-7-7

Anyone who knows and loves Britain's orchids will be familiar with the south-east of England, with its rolling downland and chalky beechwoods where some of our rarest native species reside. Kent is one of our most famous counties and it comes with an orchid flora worth boasting about.

David Johnson became an orchid obsessive in his thirties and, like me, the plant that first grabbed his attention was the Bee Orchid. Since then, he has gone on to document orchids across his native Kent and has spent the last ten years collating his knowledge and experience into this, the first orchid Flora for the county.

Wild Orchids of Kent is an exploration of Kent's rich orchid history, from the plants themselves to the botanists that have dedicated their lives to recording them. After introducing himself and his own interest in the subject, Johnson acquaints us with the numerous names and faces of Kent's most prolific orchid hunters. Alongside well-known characters, such as Charles Darwin and Jocelyn Brooke, the lives and contributions of the many individuals who have devoted themselves to Kent's orchids are recounted in fascinating detail. Much is made of the fact that Darwin, whose book about orchids was published shortly after *On the Origin of Species*, lived in the Kent village of Downe, where his regular observations of local orchids helped him to develop his ideas about natural selection.

The species accounts themselves are just as well researched as are the lives of Kent's botanists. Distinctive features, folklore and historical records are included for each orchid, accompanied by colour photographs and county distribution maps. Detailed descriptions of colour variants, morphological aberrations and hybrids have been incorporated here, while also being given their own chapter, detailing the extensive variation encountered in Kent's orchid flora. The quality of the images is occasionally a little disappointing, and many of the photographs were taken pre-2000, but as the book does not claim to be an identification guide this is perhaps relatively inconsequential.

Thirty-eight of the 50 or so British species are included and there is a tangible pride in the coverage of Late Spider, Lady and Monkey Orchids, the rare, exotic-looking species for which Kent is botanically most famous. The inclusion of species such as Red Helleborine and Military Orchid, however, might seem slightly surprising. These plants only have a few, largely unverified, records in Kent, although, where relevant, this is acknowledged by the author. Having said this, the book is nothing if not comprehensive and it is exciting to think these species could be rediscovered one day in the depths of a Kentish woodland.

If the reader is unsure where to start searching for these charismatic plants in the county, Johnson provides a run-down of the best orchid sites in Kent – 23 in total – including old favourites, such as Darland Banks and Sandwich Bay, but also places new to me that I have yet to explore. It was particularly nice to read about some of Kent's more unusual orchid sites that do not host the big-hitting names or the classic orchid-rich habitats. One such example is Holborough Marshes, in north Kent, where Southern Marsh-orchid and Early Marsh-orchid can be found.

The production of a Kent orchid Flora has been long overdue, and this wide-ranging book meets all expectations. Having spent a long time trawling through libraries and botanical collections myself, I admire Johnson's capacity for thoroughness and I only wish this book had been around when I, too, was exploring the history of Britain's orchids. David Johnson's enthusiasm and knowledge shine through. He clearly takes pride in his Kentish roots and joins a list of outstanding botanists that have gone before him, deservedly making his mark on one of Britain's most orchid-rich counties.

Leif Bersweden
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Invasive Aliens

The plants and animals from over there that are over here

Dan Eatherley
William Collins, 2019
326pp. £16.99 hbk
ISBN 978-0-00-826274-7

This is a well-researched and engagingly written overview of the effect invasive plants and animals have had on the British Isles. The author refreshingly has placed equal weight on both invasive plants and animals (pathogens also feature).

The general approach that Eatherley takes is to explore the history of how plants and animals reached our shores and how they might have thrived. He navigates through this complex world by looking at the way man has altered his environment over the millennia, with chapters on the Neolithic, Roman Britain, the Age of Discovery, right up to the present day with its international trade in horticultural plants. The race to find economically important plants from around the world in the early 19th century, orchestrated by Kew Gardens, is particularly telling.

So often his accounts reveal a catalogue of human error, short-term thinking and naivety. It seems William Robinson's *The Wild Garden* (1870) has a lot to answer for in that it encouraged wealthy estate owners to populate their pleasure grounds with naturalistic plantings of rhododendrons, Japanese Knotweed and Giant Hogweed, only to have them later abandoned following shortages of labour after World War One. We have been trying to manage the consequences ever since.

In order to better understand some of the work involved in controlling these species, Eatherley meets up with teams dealing with the likes of Indian Balsam and Japanese Knotweed. He is good at digging out memorable tales of woe, such as the tourists that had to be rescued by helicopter after becoming lost in a vast Rhododendron jungle in Killarney National Park. The numbers involved are often pretty staggering, and at times his easy narrative sounds a little like Brian Cox as he reels off the money involved: £70 million to eradicate Japanese Knotweed from the Olympic Park in London; £20 billion knocked off the value of the UK property market in 2018 by the same plant.

The author has been thorough in his coverage, even including a section on the history of wool aliens in the UK, including a trip out in south Devon in search of a relict population of *Cotula australis*. A day at a caravan park would have provided a new dimension to this story.

His information seems to be right up to date, with several sections on the latest attempts at control. I was particulary taken by his excursion to Exmoor to witness the extermination of some Japanese Knotweed, with a chap called Trevor wielding a high-voltage lance, that sounded like something out of Star Wars. The information that *Crassula helmsii* may be setting viable seed which could be increasing its spread was news to me.

Despite all the wisdom of hindsight, are we really any more careful today? The current fashion for instant 'meadows' sown along roadsides and in city parks is surely asking for trouble. The 'half a billion pounds' worth of live ornamental plants imported every year into the UK, with a Government keen on deregulation (despite the excellent work of the Non Native Species Directorate), means that we could still be seen as an open goal when it comes to new threats.

The end of the book explores the future, with the effects of a warming climate a prime concern. Right at the end, having terrified us with innumerable stories of loss of control, Eatherley poses the question, voiced elsewhere by Ken Thompson and others, that maybe we should not be so worried, as it could be argued that we ought to embrace these new arrivals and learn to accept them as part of new, perhaps more robust, ecosystems.

Despite the nature of the subject, Eatherley approaches his task with good humour and an eye for the absurd. If you want to understand how we have ended up with so many species from around the world sharing our small archipelago, then this is for you.

Andrew Branson
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Essex Botany. Newsletter of the Essex Botanical Society, nos. 1–9, 2015–2019

Managing Editor: Dr Ken Adams
To obtain copies, contact EBS Distribution, 17 Danbury Road, Rainham RM13 7UR; david@dives.myzen.co.uk.
Two issues per year.
Free (postage £5 for 5 issues)

Essex Botany is a glossy, coloured, A4 newsletter which deserves far wider circulation than a single county, for it is full of enticing and informative botanical articles, covering all traditional groups of plants and fungi. It would be difficult to imagine any botanist in any part of the British Isles who would not find something of interest, and would not learn much of value, in its pages. The first issue was published in Spring 2015, more or less coinciding with the formation of the Essex Botanical Society, and the latest (issue 9) appeared in July 2019.

Many articles are mainly of local interest, such as accounts of species newly found in Essex, but even these often have a nation-wide impact, as they often feature rare plants which are better illustrated than elsewhere in our literature (e.g. *Senecio vernalis* in issue 9), or they might be the first or even only report of a species in this country (e.g. *Zannichellia obtusifolia* in issue 6). The excellent illustrations are a major feature throughout. Other articles alert one to pitfalls or difficulties in identification, with detailed explanations of the problems and how to overcome them. These might be aimed at beginners (e.g. picture keys to daisies, mayweeds and chamomiles in issue 5), or to more advanced workers (e.g. calamint hybridisation in issue 9; *Bolboschoenus* species in issue 8). I found particularly interesting those articles which alert one to the possibility of detecting species new to this country, e.g. *Wolffia columbiana*, which has already reached Belgium and Holland and might, it is conjectured, contribute to some recent Kentish records attributed to *W. arrhiza*.

Most of the angiosperm articles are compiled by Ken Adams, one of our leading botanists, and his influence is evident throughout. He and his team are to be congratulated on a fine achievement, and I hope that this review will ensure a wider circulation.

Clive A. Stace
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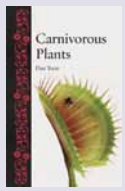
BOOK NOTES



Carnivorous Plants
Dan Torre
Reaktion Books, 2019
232pp. £16 pbk
ISBN 978-1-78914-052-1

This is another excellent addition to the Reaktion Botanical series. As with previous titles, it contains a mixture of natural history, science and folklore, both ancient and modern (expect plenty of references to triffids), as well as a chapter on the interest in cultivating these curious plants.

The author is Australian and he takes his examples from around the world, so our meagre British flora does not get much of a look in. The text is well illustrated with many excellent images.

Andrew Branson
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NOTES

FROM THE FIELD MEETINGS SECRETARY

JONATHAN SHANKLIN

The 2019 Annual Summer Meeting set in the scenic surroundings of Malham Tarn was very enjoyable. Over 40 people took part during the week and they contributed around 7,000 records. We saw some of the rare species of the area, including *Cypripedium calceolus* (Lady's-slipper), secure in a cage near the Field Studies Council Centre. Final totals are still being added up, so expect more details in a full report in the January issue. Next year the meeting will take place in Scotland, and we have been invited to Guernsey in 2021.

In 2020, we will not have the pressure of Atlas 2020 recording to focus field meetings, but there will be other recording projects that will benefit from the additional participation that such meetings bring. We will also hold field meetings simply to visit interesting places and others to help train future and existing recorders. If you would like to host a meeting do let me have details in plenty of time to draw up a list for the Exhibition Meeting.

Jonathan Shanklin
jdsh@bas.ac.uk

BSBI members enjoying a lunch break at the Annual Summer Meeting. *Colin Conroy*

PANEL OF VICE-COUNTY RECORDERS

PETE STROH

There is one change to report since the April *BSBI News*. In **Merionethshire** (v.c.48), Jo Clark (j.clark315@btinternet.com) joins Sarah Stille as Joint Recorder for the county. Jo was involved in the SSSI designations for the wonderful Meirionnydd Oakwoods, has organised and led many field trips in the county, and has a particular interest in botanical field training. Many thanks to Jo, an excellent addition to the VCR network.

There are a few changes to **addresses**, should you wish to write to your VCR.

Ian Denholm (v.c.20) has moved to 3 Osier Close, Melton, Woodbridge, Suffolk IP12 1SH.

David Hawker (v.c.73) now resides at 'Suilven', 13 Bakers Dozen, Gatehouse of Fleet, Castle Douglas DG7 2LA.

Angus Hannah's (v.c.100) new address is 21 Ferfadd Court, Rothesay, Isle of Bute PA20 0HE.

There remain VCR **vacancies** for eight vice-counties: East/West Sussex; South Hampshire (alongside Martin Rand); Argyll (alongside Gordon Rothero); Banffshire; Berwickshire; Co. Longford; Co. Louth. If you are interested in becoming a VCR and want more details about what is involved, please do get in touch with the relevant Country Officer – your county needs you!

Pete Stroh
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BRITISH & IRISH BOTANY

LOUISE MARSH

The first three issues of *British & Irish Botany* are now online and they are all open access. Following the decision to replace *New Journal of Botany*, BSBI's scientific journal, which ran from 2011 to 2017, with an open access, online successor (see *BSBI News* 138, p78), we are delighted to share with you details of the first three issues of Volume 1 of *British & Irish Botany*. Issue 1 was published in February, Issue 2 in May and Issue 3 in August.

Issue 1: Table of Contents

Distribution and population size of *Hieracium stenolepiforme*, Cheddar Hawkweed (Asteraceae) – H.J. Crouch, E.J. McDonnell, S. Miles, T.C.G. Rich

Dog-roses (*Rosa* sect. Caninae): towards a consensus taxonomy – P. Bakker, B. Maes, R. Maskew, C. Stace

Response of moorland vegetation to 20 years of conservation management in two Cairngorm glens – D. Welch, D. Scott

Oaks (*Quercus* spp.) parasitised by mistletoe *Viscum album* (Santalaceae) in Britain – J. Box

Population dynamics and life history of the rare arctic-alpine plant *Sagina nivalis* (Caryophyllaceae) on the Ben Lawers range, Scotland, UK – D.K. Mardon, S.H. Watts

You can view or download all these papers free of charge at: https://britishandirishbotany.org/index.php/bib/issue/view/1

Issue 2: Table of Contents

Changing status of *Blysmus compressus* (Flat Sedge) in the Sefton Coast sand-dunes, north Merseyside, UK – P.H. Smith

Pedunculate Club-rush *Bolboschoenus laticarpus* (Cyperaceae) – an overlooked native or a spreading neophyte? – F.J. Rumsey, H.J. Crouch, R.V. Lansdown, M.A. Spencer

Long-term monitoring of Green-winged Orchid (*Anacamptis morio*) at Upwood Meadows NNR, Huntingdonshire – P.A. Stroh

Deschampsia cespitosa subsp. *parviflora* (Poaceae) – an overlooked woodland grass – A. Amphlett

Achene Morphology of British and Irish Mayweeds and Chamomiles: implications for taxonomy and identification – C.A. Skilbeck, I. Lynch, M. Ellenby, M.A. Spencer

Five new species of *Taraxacum* section Celtica (Asteraceae) from Britain and Ireland – A.J. Richards

You can view or download all these papers free of charge at: https://britishandirishbotany.org/index.php/bib/issue/view/2

Issue 3: Table of Contents

Japanese Rose (*Rosa rugosa*): its invasion and colonisation of the Sefton Coast, north Merseyside, UK – Philip Howard Smith, Ben Deed

Inland populations of *Juncus balticus* (Juncaceae) in Scotland – Andy Amphlett

Pangium edule (Achariaceae) drift endocarps first records from UK and Bermuda waters and a review of NW European records – Declan Thomas Gerard Quigley, Paul Gainey, Andy Dinsdale

Conservation status of *Sorbus cuneifolia* (Rosaceae), Llangollen whitebeam – Tim Rich, Libby Houston, Sarah Bird, Vicky Morgan, Ros Stockdale, Rhun Jones, Andrew Goodwin, Richard May, David Sheil

Euphorbia hyberna in England: native or naturalised? – John Lucey

You can view or download all these papers free of charge at: https://britishandirishbotany.org/index.php/bib/issue/view/3

We hope to publish a fourth issue towards the end of the year.

We also hope you will consider publishing in, as well as reading, *British & Irish Botany*. Once you have registered as an author (very quick and easy!), you can either use the simple and straightforward online submission system: https://britishandirishbotany.org/index.php/bib/about/submissions or send your manuscript to the Editorial Office: bib@bsbi.org and we will do it all for you. 'We' are Editor-in-Chief, Ian Denholm, and Editorial Assistant, Louise Marsh. We look forward to hearing from you.

Louise Marsh, BSBI Communications Officer
louise.marsh@bsbi.org

BSBI EXHIBITION MEETING 2019 AND NEW YEAR PLANT HUNT

LOUISE MARSH

BSBI Exhibition Meeting 2019

We return to the Natural History Museum in London for this year's Exhibition Meeting. We hope you will join us on Saturday 23rd November for a day of talks, posters, displays and networking. The morning's talks focus on 'BSBI and friends: our botanical year' and, for the first time, we will be featuring flash talks from exhibitors.

After the AGM and a few words from incoming President Lynne Farrell, the afternoon's talks will focus on 'BSBI Research and Publications'. Speakers include Tim Rich, Alex Twyford and our keynote speaker is Clive Stace talking about the evolution of his *New Flora of the British Isles* from edition 1 to this year's edition 4. Find out more in the flyer (inside this issue of *BSBI News*) where you can also book exhibitor space or put your name down for a behind-the-scenes tour of the NHM herbarium. Or visit: www.bsbi.org/annual-exhibition-meeting.

New Year Plant Hunt

BSBI's ninth New Year Plant Hunt will run from Wednesday 1st to Sunday 4th January 2020. In the past, we waited until 1st December to release the dates on the BSBI website and via social media, but now that the Hunt has become so popular (c. 1,500 participants last year) and many of you are opting to join group 'hunts', we decided to give you as much notice as possible this time! If you are new to the New Year Plant Hunt, you can read all about it in *BSBI News* 141, pp 14-19 or at: https://bsbi.org/new-year-plant-hunt.

Louise Marsh
BSBI Communications Officer, 234 London Road, Leicester LE2 1RH
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BSBI DIARY 2019-20

2019		
Friday 13 September	Committee for Scotland	Perth
Saturday 21 September	Irish AGM	Glasnevin, Dublin
Tuesday 24 September	Meetings and Communications	Natural History Museum, London
Saturday 25 September	Committee for Wales	Plas Dolerw, Newtown
Tuesday 8 October	Records and Research	London
Thursday 10 October	Publications	London
Monday 21 October	Training and Education	The Gateway, Shrewsbury
Saturday 26 October	Committee for Wales	Plas Dolerw, Newtown
Saturday 2 November	Scottish AGM and Botanists' Conference	Royal Botanic Gardens, Edinburgh
Friday 22 November	Council	Linnaean Society, London
Saturday 23 November	AEM & AGM	Natural History Museum, London
Tuesday 3 December	Board of Trustees	Linnaean Society, London
2020		
Tuesday 28 January	Records and Research	London
Monday 10 February	Training and Education	The Gateway, Shrewsbury
February	Publications	London
Spring 2020	Recorders' Conference	tbc

Delyth Williams, Honorary General Secretary

LETTERS

NON-NATIVE INVASIVES

While admiring the enthusiasm of those who spot non-native plants in the wild, and increasingly report them to *BSBI News*, I wish this enthusiasm could be harnessed to controlling the worst invasive species. When P. Jepson records a new plant invasion in a local stream in *BSBI News* he describes it as 'most alarming' and 'a serious threat' (Jepson, 2019). Yet more frequently we read, as on page 46 of the same issue, 'two recent records ... hint encouragingly at ... a tendency to stray' and on page 61 'the first in Ireland ... Might be one to watch out for'. Given rapidly increasing governmental alarm over invasive species, and the high level of control in some other countries, does it not seem surprising that a view on such arrivals is absent from the BSBI's new policies? We are a set of islands, our waterways, woodlands, etc. are widely visited, and we should stand a good chance of putting any policy into action.

The time seems ripe to canvass our membership, and link in with the policymakers in this field. Our expertise as BSBI members means we should at an early stage be able to spot potential problems of plant invasions. Also, as individuals, we should not shy away from pulling up offending plants that we find.

Reference

Jepson, P. 2019. *Persicaria runcinata* discovered in modern-day Lancashire. *BSBI News* 140: 53–55.

Nick Miller
Tiger Hill Cottage, Bures, Suffolk CO8 5BW

ERADICATION OF *IMPATIENS GLANDULIFERA* (INDIAN BALSAM) – A PERSONAL VIEW

In 1944, when I was 11 years old, I was out on an evening walk near Grantham (Lincs.) from Gonerby Hill towards Manthorpe when down in a remote ditch I came across a single, unfamiliar plant. It was clearly not a recent planting. I presume that we took a sample home with us (as one did then). My father drew a picture of it for me, which I still have after 80-odd years.

My father and I looked it up in our only childhood and war-time botanical reference book, W. Percy Jones's *The Rambler's Guide to Wild Flowers* (1941), but we failed to find it. So far as we knew, there were no other botanists that we could consult in the small mining town where I was growing up, so, perplexed, I wrote for the first time, in my sketchy hand, to Kew seeking help in identifying it. (I had heard of Kew but knew nothing about it.) Kew replied, suggesting it was *Impatiens glandulifera*. This was, of course, listed briefly in Jones, but Dad and I had completely overlooked it. Jones listed it as 'uncommon' and 'rare'.

Grantham is situated on the west bank of the River Witham, and about 30 miles downstream from the source. At Grantham, the river was fairly fast-flowing, so not congenial to plants such as *I. glandulifera*. Could my find have originated nearer the source? My relatives lived near the river but in ten years of subsequent visits I never encountered another *I. glandulifera* there. All this was just before the ferocious expansion that we know today had begun.

Nowadays, I have some sympathy with David Trudgill's 'personal view' that some effort needs to be in hand to limit this growth. Here, in Ilkley (v.c.64), we have stretches of the River Wharfe whose banks are infested with *I. glandulifera*, and our Wharfedale Naturalists Society tries to keep an eye on it, but the relentlessness of the spread defeats us, although it never stretches far above the water-line.

So, given that this old Himalayan introduction is beautiful and interesting and has survived for nearly 200 years, I would be sad if it was now to be completely eradicated.

Mike Atkinson
7 Old Bridge Rise, Ilkley LS29 9HH

PANEL OF REFEREES AND SPECIALISTS

JEREMY ISON

Please note the following change of address:
Dr Ian Denholm (Orchidaceae):
3 Osier Close, Melton, Woodbridge, Suffolk IP12 1SH; tel. 01394 388974

Jeremy Ison
40 Willeys Avenue, Exeter, Devon EX2 8ES; tel. 01392 272600; **jeremyjison@gmail.com**

BSBI PHOTOGRAPHY COMPETITION 2019

JIM MCINTOSH

There is still time to enter this year's competition. Full details are on the BSBI website and a summary appeared in the last *BSBI News*. **The closing date for the competition is 18th October.**

Jim McIntosh
jim.mcintosh@bsbi.org

CONGRATULATIONS

We would like to congratulate Dr Goronwy Wynne on the award of the Linnean Society's H.H. Bloomer medal, which is awarded to an amateur naturalist for an important contribution to biological knowledge. In addition to his publication of the *Flora of Flintshire* (1993), Goronwy has recently produced his *magnum opus, Blodau Cymru*. To adapt the publisher's description, this is an illustrated, comprehensive introduction to Welsh plants and flowers and their habitats, ecology, history and characteristics. The book includes chapters on each old Welsh county, with their characteristics and special flowers, and clear guidance is given on how to learn more about these flowers. An essential guide to the world of flowers by a renowned Welsh botanist.

It has recently won the Welsh Book of the Year award and is already on its third printing. Goronwy was vice-county recorder for Flintshire for 46 years.

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