BSBI NEWS

SEPTEMBER 2018 139

Botanical Society of Britain & Ireland

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Front cover Botanists admiring a display of orchids at Bohuntin, Glen Roy (see p. 63). *Ian Strachan*

Contributions for the next issue of ***BSBI News*** (no. 140) should be sent to the Editor Andrew Branson (**andrew.branson@bsbi.org**) by **27th November 2018**.

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Botanical Society of Britain & Ireland

FROM THE PRESIDENT

I'm not really in favour of a regular 'Presidential' column, which is why you have not heard from me in the first two issues of the revamped *BSBI News*. Andrew Branson had plenty enough material without any waffle from me. But this time I have some news, and good news at that!

I think that first of all, however, I should, on behalf of the whole BSBI, thank Andrew for producing such an excellent magazine. As several members have remarked, it's evolution not revolution, something that the BSBI does rather well.

Now to the news. The Trustees have decided to restructure staff posts to some degree to allow the appointment of a full-time English Officer. Pete Stroh is currently working (very) part-time in this capacity, alongside his other duties as Scientific Officer and Atlas Coordinator, and the plan is for Pete to take up the role of English Officer full-time as and when the Atlas project allows, bearing in mind that there is still much to do before the project is completed. As you will all know, the Country Officer system has worked very well in Scotland, Wales and Ireland for some time, and to such an extent that English members are beginning to feel left out! Council is currently consulting on post-*Atlas 2020* activity, and many of you will have already heard from Robert Northridge and his team asking for views. Expanding the number of Country Officers will clearly help in furthering our new priorities.

BSBI's Trustees are keen that the Society is one that values its volunteers and keeps them at the core of what it does. To aid this, Pete Stroh has included a piece in this edition of *BSBI News* (see p. 79) seeking volunteer involvement with updating species captions for the forthcoming *Online Atlas*.

And, finally, more good news. The Society has not had a Handbooks Editor for some years and the gap has become more and more noticeable. I'm delighted to report that Martin Godfrey has agreed to take on this role and we wish him well.

Chris Metherell
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BSBI DIARY 2018/2019

2018		
Saturday 6 October	Committee for Ireland	Dublin
Thursday 11 October	Publications	London
Friday 12 – Sunday 14 October	Recorders' Conference	Shrewsbury
Thursday 18 October	Training and Education	Shrewsbury
Saturday 20 October	Ireland Recorders' Conference	Dublin
Saturday 27 October	Committee for Wales	Newtown, Powys
Friday 2 November	Council	Edinburgh
Saturday 3 November	Scottish Botanists' Conference	RBGE
Saturday 17 November	AEM & AGM	Ormskirk
2019		
Tuesday 29 January	Records and Research	London
Thursday 7 February	Training and Education	Shrewsbury
Thursday 14 February	Publications	London

Life after the Atlas: what do members want to do next?

KEVIN WALKER, PETE STROH & ROBERT NORTHRIDGE

As the sun begins to set on recording for *Atlas 2020* the time seems right to consider what might come next. BSBI Council has therefore been asked to consult recorders and members about their preferences for future recording projects. In June, all Vice-county Recorders were asked to complete a questionnaire and forward on their own ideas; to date (July), nearly 60 VCRs have responded and we hope more will do so once the field season comes to an end. In the meantime, we would also like to hear from members, young and old, about the projects that would interest and inspire them. So please complete the questionnaire (see link on page 6) or just email us. Don't miss out, as this is your chance to influence the work of the BSBI for many years to come.

In this article, we have suggested a few ideas that we think would appeal to members **and**, at the same time, further our understanding of the British and Irish flora.

Holiday!

Atlas-style recording has dominated our work for almost three decades and we realise that some, if not all of you, would like a break. We doubt you would spend much of this 'holiday' by the pool. It is more likely that you would spend the time finishing off personal projects or starting new ones. As volunteers, it is your choice, but on balance we feel that it is better to have a range of projects that members can dip into; exhausted recorders can always take a break if they need to. So, one option would be to have a two-year holiday from major recording projects, whilst at the same time launching some smaller projects that members can get their teeth into.

Recording *Ligusticum scoticum* (Scots Lovage) on Colonsay in 2018. *Pete Stroh*

Beyond maps

One of the key questions BSBI needs to address is how much effort to put into blanket distribution mapping. Either we carry on as before, aiming to map coverage at hectad level every 20-30 years, or we focus on a much smaller sample of, say, monads that are recorded in a more systematic manner.

The latter would provide robust indices of change that are not as easy to generate using the current atlas-style recording, and the time saved (in covering less ground) could be invested in recording squares more systematically and frequently, for example, by following fixed routes and recording abundance and habitat associations. What we are essentially describing here is a 'Monitoring Scheme Mark II' – a national sample of constant effort squares that, if carefully selected (i.e. in a way that was representative and without bias) and recorded in a controlled way, could provide a very powerful dataset from which to detect and analyse change. Other wildlife organisations use similarly structured approaches (e.g. BTO, Butterfly Conservation, Bat Conservation Trust) and have been highly successful in raising awareness of the threats that our fauna face, as well as influencing decision-makers to do something about it. Take the BTO's annual trend indices for birds. During the last series of BBC's *Springwatch* we lost count of the number of times they were used to illustrate changes to our nation's wildlife. There is no reason why there could not also be a BSBI graphic showing the fate of arable weeds, grassland or montane species, but this requires a well-designed scheme to produce the evidence.

This brings us neatly onto the National Plant Monitoring Scheme (NPMS). This scheme, which was launched in 2015, is run jointly by BSBI, CEH and Plantlife, with funding from JNCC, and aims to measures changes in the abundance of indicator species within small fixed plots located within different habitats (Walker *et al.*, 2015). Because the plots are located randomly within selected grid squares, bias is minimised – consequently we can be confident that the changes are real and not just an artefact of the survey method. It is not everyone's cup of tea, but it does provide an extremely powerful tool for measuring what is happening to our semi-natural habitats, much in the same way as the Countryside Survey did in the past. There is no reason why a 'Monitoring Scheme Mark II' couldn't run in parallel to NPMS, i.e. with BSBI members intensively recording the flora of the squares in which the plots are nested.

Environmental drivers

Surveillance schemes, such as NPMS and the BTO's Breeding Bird Survey, make no assumptions about the changes that might take place – they are designed to record the changes and, if the signal is strong enough, they allow us to correlate trends with major drivers. The other option is to design schemes to address specific questions – the most pressing for our wildlife at the moment being the impacts of changing land use, climate change, eutrophication, and invasive aliens. Despite a great deal of research, the nature and scale of some of these impacts is still far from clear. BSBI members certainly have the expertise to start to address these questions. For example, climate change impacts can be measured by monitoring how mountain summit floras have changed compared to a historic baseline. This approach has been tested throughout Continental Europe and Scotland and has revealed a consistent shift in species composition in response to warming (Gottfried *et al.*, 2012; Pauli *et al.*, 2012). A standard method has also been developed to assess both historic and future changes (Stöckli *et al.*, 2011) and this approach could be extended to Britain and Ireland by including 'summits', say, above 600m.

Another approach would be nationwide recording of first flowering dates, to replicate Richard Fitter's long-term garden study (Fitter & Fitter, 2002). Studies of eutrophication (airborne or otherwise) are urgently needed and, to use a topical example, could be focused on the changing flora of roadside verges, using, as a baseline, historical records collected in the 1970s prior to blanket mowing for road safety and the dramatic increase in nitrous oxides from exhaust emissions. Then there are invasive aliens: there are plenty of studies looking at the impacts of cause célèbres, such as *Crassula helmsii* (New Zealand Pygmyweed), *Impatiens glandulifera* (Indian Balsalm), *Fallopia japonica* (Japanese Knotweed) and *Heracleum mantegazzianum* (Giant Hogweed), but what is really needed are studies that look at their impacts *on average* within wild locations or the threats posed by new and emerging aliens that we might be able to control if we treat them at an earlier stage of invasion, e.g. *Hydrocotyle ranunculoides* (Floating Pennywort).

Participants working through keys at a BSBI workshop held at the National Biodiversity Data Centre, Co. Waterford, in May 2018. *Maria Long*

Education, education, education

Possibly the BSBI's biggest success in recent years has been its work on training and education, largely through the unstinting efforts of Sarah Whild and the Training Committee. This has been aided and abetted by an increasingly impressive presence on social media, via Facebook, Twitter and our website. All this means that the profile of BSBI and interest in its work has never been higher. This new 'reach' means that there is an increasing demand for BSBI-approved courses, which is vital given the decline in taxonomy in schools and universities. Over the next decade, BSBI could therefore look to develop projects that provide resources and learning opportunities for all abilities, especially beginners and improvers who are making their way up the 'skills pyramid'. We also need to continue to provide workshops on advanced taxonomy, develop local groups and organise more field trips for all abilities.

Understanding our flora

Recent advances in DNA technology means that the pace of taxonomic (nomenclatural) change is increasing and whilst this is helping to solve some long-running debates, it is also throwing up new challenges for the field botanist. There is therefore potential to run projects that address some of these old and new taxonomic problems; for example, investigating variation, new taxa, cryptic/critical taxa, and hybrids. A good example is the genetic work on eyebrights that helped to inform the new BSBI handbook (Metherell & Rumsey, 2018), although the findings have highlighted some intractable problems that may never be solved (Wang *et al.*, 2017). There is also increasing interest in the use of eDNA or image recognition for species identification, and BSBI members could potentially help to test the efficacy of these new approaches in the field.

Autecology

The BSBI has always been very ecologically minded, possibly because the pioneering ecologists were often botanists (e.g. Tansley, Watt). Their legacy was clear to see during the Threatened Plants Project (Walker *et al.*, 2017), where recorders were asked to collect a whole range of ecological information, including habitat type, management, threats and associated species. The response to the work was very positive and suggested that there is a real appetite for this type of study. It may be viewed by some as old-fashioned, but it is great fun to do and without it we would know next to nothing about our flora. Again, the possibilities are endless, but projects that aim to collect basic information on the ecology, abundance, life histories and habitat requirements of both natives and non-natives would be a good place to start.

Interactions

Plants do not live in isolation. They provide food and habitat for a vast range of other biota; they define ecological communities and, to use a current

An *Argogorytes* wasp on *Ophrys insectifera* (Fly Orchid). *Pete Stroh*

buzzword, they are central to many 'ecosystem services' upon which we humans rely. In the past, BSBI has not focused on exploring these relationships, but the greater appreciation of their value to us and other wildlife seems like an opportunity that is too good to miss. Obvious projects might be to record associated fungi (especially smuts and rusts), insect galls or pollinators, possibly collaboratively with other societies such as the British Mycological Society, British Gall Society or Bees, Wasps and Ants Recording Society (BWARS).

Let us know what you think

This is just a flavour of what we might achieve. We cannot do it all but it would be good to have 'something for everyone'. So please let us know what you like, dislike or think we have missed. You can do this by completing the questionnaire which is available to download from the BSBI website (https://bsbi.org/) or by emailing us direct (see below). We would like to receive these by 20th October, if at all possible, so that we have time to assemble your responses for the next BSBI Council meeting which takes place on 2nd November. Council will then discuss them and make recommendations to the Board of Trustees. A plan should therefore start to emerge by next spring, hopefully in time for us to report back in the April *BSBI News*.

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Changing names: can we or the books keep up?

CLIVE STACE

The names of plants are governed by the International Code, now known as the *International Code of Nomenclature for Algae, Fungi and Plants*, recently renamed in belated recognition of the fact that fungi and algae, other than the green algae, are not true plants. If a plant is to be known as a species in a particular genus, the Code will tell us exactly what to call it. But it will NOT provide taxonomic opinions. Hence, according to taxonomic opinion, there may be several names available that are correct according to the Code. For example, one is free to use the equally correct *Pinus larix* or *Larix decidua* for European Larch, or *Ranunculus ficaria* or *Ficaria verna* for Lesser Celandine. So why are there different taxonomic opinions?

Sometimes it is simply a personal opinion, for instance, as to whether two genera should be amalgamated or not (as in the above two examples), or whether two taxa should be recognised as species or subspecies (e.g. *Festuca rubra* ssp. *arctica* or *F. richardsonii*). Many taxonomists have sought to provide guidelines on how to come to a wise decision in such cases, but no-one has attempted to introduce laws that demand one particular outcome. And that is very unlikely to happen, because any laws would prove highly contentious and divisive. There are no rigid workable definitions of genera, species or subspecies. Taxonomists tend to be splitters or lumpers, and that is unlikely to change; many would say 'vive la différence'. But there are many other factors involved in determining taxonomic status.

Molecular evidence

In some cases it depends on the weight placed on different types of evidence, e.g. morphology versus inter-fertility, or anatomy versus phytochemistry. The availability in the last two decades of molecular evidence, mainly base-sequences of certain regions of DNA, has revolutionised the way we classify plants based on their phylogeny (ancestral relationships). If the DNA sequence data have been collected and analysed rigorously, there can be no arguing with the facts; DNA gives us an unequivocal statement of phylogeny which leads us to a classification based on it. If our 'traditional methodology' has been an accurate predictor of relationships, the molecular

Ficaria verna or *Ranunculus ficaria* (Lesser Celandine)? *Bob Gibbons*

Examples of the realignment of the poppy genera: **left** *Papaver cambricum* (Welsh Poppy), **right** *Roemeria argemone* (Prickly Poppy). *Bob Gibbons*

amethodology will simply confirm it, but where the molecular system contradicts the previous one the traditional methods have misled us, or we have misinterpreted them.

The results of molecular taxonomy should at the present time be viewed at two levels: at and below the family level. At the family level the classification of flowering plants is laid out in a scheme known as APG-IV (2016), which is the fourth revision of a family classification presented by an informal international group (Angiosperm Phylogenetic Group) of 25 (mainly molecular) taxonomists. This classification has barely changed from the first edition of 20 years ago (1998), and it is expected to endure for the foreseeable future; for our flora it can be viewed as virtually fixed for perpetuity. That is not to say, however, that there is not room for differences of opinion. There are still splitters and lumpers, and, where two classifications both fit the evidence, either can be adopted. For example, those two well-known aquatics, *Sparganium* (bur-reeds) and *Typha* (bulrushes) are the only genera world-wide in the families Sparganiaceae and Typhaceae. Molecular evidence tells us that the two genera are more closely related to each other than to any other genera, and that they have a common ancestor not shared by any other genus. On molecular grounds, therefore, they can equally correctly be assigned to one or two families. In APG-IV they are both placed in the Typhaceae; the APG freely admits to being a lumper! More recently (2016), and more radically, the Boraginaceae of APG-IV have been divided into 11 families; both the one- and eleven-family systems are equally supported by the molecular evidence – it is not a case of one being right and one wrong. (All the British natives remain in Boraginaceae.)

Below the family level the situation remains much more fluid. The DNA of many groups has not yet been analysed, and even in those where it has, the breadth of sampling (e.g. proportion of known species in a genus) has often been inadequate. This can lead to the situation where two studies, using a different pattern of sampling, can produce two different phylogenies and therefore

classifications. Such is the case in the two best-known (and significantly differing) analyses of the woody Rosaceae (*Malus*, *Sorbus*, *Cotoneaster*, etc.); evidently in neither case was the level and pattern of sampling adequate. Situations like that result in the fluidity mentioned above. They will be resolved in time, but it takes much time and money. Today we find ourselves in a position where many changes to our old classifications have already been established, many more are provisionally indicated, and yet more changes are coming to light monthly, with still no end in sight. We are in a very volatile situation, and the belief that in, say, 20 years we shall have encountered and assimilated the vast majority of changes to at least the west European flora indicated by molecular techniques seems scant consolation.

How this affects the *New Flora*

Flora writers therefore have a problem. Their primary aim, in my opinion, should not be to innovate, but to present the current consensus. However, they frequently have to choose whether to split or lump taxa, and to decide whether a newly presented classification is sufficiently supported (evidence-based) to be worthy of adoption. In the latter case, I prefer a cautious approach, making changes only where I think the evidence is overwhelming. In my opinion it is better to remain with the *status quo*, awaiting better data before changing, than to make changes that later have to be reversed because the evidence turns out to be false. At the genus and species level changes in classification generate new names for familiar plants, and the stability of names as far as the evidence allows should be the goal of all taxonomists.

One regrettable consequence of the adoption of a DNA-based classification is that there are a few cases (six at the last count) in our flora where two or more genera are now indistinguishable on morphological criteria. These are cases where the molecular evidence unequivocally shows that two or more groups formerly in one genus are in fact not as closely related as we thought, i.e. there are other species more closely related to one or more of these groups than the groups are to each other; in other words, the old genus is polyphyletic, not monophyletic. One of the six cases, the redefined *Anacamptis* and *Orchis*, was dealt with in the third edition of *New Flora of the British Isles*, but now there are five more. Two examples are *Senecio* and *Jacobaea* (the latter containing *S. jacobaea*, *S. aquaticus*, *S. erucifolius*, *S. paludosus* and *S. cineraria*) (note that hybrids are frequent within each genus, but absent between them); and *Saxifraga* and *Micranthes* (the latter containing *S. stellaris* and *S. nivalis*). Fortunately, there are few similar cases, and we shall simply have to learn to live with them.

New Flora of the British Isles (1991, 1997, 2010) has always attempted to follow the above principles. The first two editions followed the Cronquist system of family classification, but the third (the first after the introduction of molecular classification) utilised the APG system. Since 2010, many new data have been published, leading to numerous changes to the classification and names of our plants at the generic and specific levels. Over 40 changes at the generic level have accumulated over the past eight years, involving both splitting and amalgamation of existing genera. Despite our dislike of name changes, we have to follow them because the evidence is compelling and all other new Floras will be doing likewise.

In order to give a flavour of the type of changes involved, here are eight examples:

- *Chenopodium*, *Gnaphalium* and *Sedum* each split into five genera.
- *Aster* and *Mimulus* each split so that we no longer have any species in those two genera.
- *Apium* split into *Apium* (*A. graveolens* only) and *Helosciadium*.
- *Kobresia* subsumed into *Carex*.
- *Lathyrus* and *Pisum* amalgamated.
- *Deschampsia* split into three genera.
- *Anagallis*, *Trientalis*, *Centunculus* and *Glaux* subsumed into *Lysimachia*.
- *Meconopsis cambrica* transferred to *Papaver*, but *Papaver argemone* and *P. hybridum* transferred to *Roemeria*.

Examples of genera in which I consider the available evidence to remain incomplete, despite the

Separation of stonecrop genera: **main photograph** *Phedimus spurius* (Caucasian-stonecrop), **left** *Hylotelephium telephium* (Orpine), **right** *Petrosedum rupestre* (Reflexed Stonecrop). *Bob Gibbons & Clive Stace*

almost certain need to split them in the future, are *Stellaria*, *Sorbus*, *Scilla* and *Ornithogalum*.

In addition, since 2010 the discovery or arrival of extra species has continued non-stop. Over 200 extra taxa qualify for inclusion. Perhaps, surprisingly, these include five newly discovered natives, one new neonative, and 18 hybrids additional to those included in *Hybrid Flora of the British Isles* (2015). Because of all these developments, a **fourth edition of *New Flora of the British Isles*** is planned for publication in January 2019, while I am still capable of producing it! It will be the last. For an initial period it will not be available from the usual sources (bookshops in all their guises), but either from the flyer in this issue of *BSBI News* (N.B. pre-publication offer until 31st January) or from the website below.

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Comment: A wider scope for defining rarity

JAMES ROBERTSON

The 2020 Atlas is adding extra impetus to recording efforts. In my own vice-county 200 or more taxa are recorded from about an eighth of Anglesey's monads, and the search is on to add records for under-recorded squares (avoiding those consisting almost entirely of sea). The collection of plant records within a monad or tetrad is enjoyable and knowledge has its own rewards.

The long tradition of recording the presence or absence of a species in a 10-km square has provided a measure of that species' range, but not of population, and the picture it presents of decline (or increase) over time is partial, sometimes reflecting recording effort rather than real change. The careful monitoring of populations is time-consuming and it may be hard to maintain continuity. Understandably, such monitoring effort is largely restricted to the rarest species. Rarity attracts attention.

BSBI's Threatened Plants Project has provided a wealth of detail about the fortunes of 50 threatened plants, and, in the process, identified those groups which are facing the sharpest declines, such as arable species. Most of these threatened plants are either at the edge of their ranges, depend on transient habitats and/or are poor competitors. They are rare within Britain (and indeed its countries and vice-counties), but are not necessarily rare globally. If rarity were defined in absolute terms, then a small number of species which are relatively common here would suddenly assume heightened importance. Perhaps they would even merit a BSBI Internationally Important Plants Project?

The species which British botanists are most likely to agonise over, and pull out the conservation stops for, are very often common elsewhere. Furthermore, the native status of a number of them is in doubt: their presence in Britain may be more by accident (or human intervention) than by nature's design. But those which have a restricted global distribution with their headquarters in these islands do not get the attention they deserve. Indeed, most botanists would be hard-pressed to name many of the plants for which

Erica cinerea growing with *Ulex gallii* (Western Gorse) and *Agrostis curtisii* (Bristle Bent) at Hartland Moor, Dorset. *Bob Gibbons*

Britain has an international responsibility.

The Vascular Plant Red Data List for Great Britain (Cheffings & Farrell, 2005) contains the first serious attempt to identify plants for which Britain holds a significant proportion of the European population. This depended on historical sources, as at the time distribution information for western Europe was available only at a very large scale. Since then there has been a surge in survey work and in atlases mapping plant distribution by hectad (10-km square or similar). The increase in published distribution data, much of it available on-line, will greatly assist BSBI in its desire to present a better picture of those species for which we hold important populations.

Nevertheless, the Red Data List provides a good starting point, and includes 43 endemics. Although this number is modest compared with, say, the Mediterranean (Cyprus alone having 143 endemics), it is impressive for these islands, with their relatively limited post-glacial flora. However, some of these, such as *Sorbus, Limonium* and *Euphrasia*, belong to critical genera. The overall list includes many familiar species, such as *Scilla verna* (Spring Squill), *Erica cinerea* (Bell Heather), *Scutellaria minor* (Lesser Skullcap), *Myrica gale* (Bog Myrtle) and *Hypericum elodes* (Marsh St John's Wort). The number of species whose requirements, through geography and climate, are best provided by present-day Britain (and Ireland), defined as species for which Britain possibly, probably or certainly has 25% or more of the European population, is about 80, although this figure could rise or fall with better data. Almost by definition, most are not rare here – it is outside these islands that they become so. Perhaps the best known of these is the BSBI emblem, *Hyacinthoides non-scripta* (Bluebell). It requires an act of faith to stand in a Bluebell wood in early May and accept that you are looking at a globally scarce flower.

Estimating the populations of a species, such as *H. non-scripta*, which is so common here, occurs in such diverse habitats and which also has part of its core range in Ireland – it is County Down's 'County Flower' – is simply not possible. Even the populations of nationally rare plants are hard to estimate reliably and meaningfully. How do you calculate the proportion of a 'globally restricted' species with its headquarters in Britain and Ireland?

In 2008 Plantlife published a *Vascular Plant Red Data List for Wales,* one aim of which was 'to assess the level of threat facing vascular plant species… so that priorities can be identified within Wales for conservation action.' This thorough piece of work by Trevor Dines includes a list of species for which Wales has a particular responsibility. Wales has the entire Great Britain population of a dozen of these, including botanical stars such as *Gagea serotina* (Snowdon Lily), *G. bohemica (*Early Star-of-Bethlehem), *Telephroseris integrifolia (*South Stack Fleawort) and three endemic *Sorbus* species (whitebeams). There is no denying the importance of these species, but it would be interesting to consider them in a wider international context. Such a context would also draw in a different suite of plants deserving conservation attention, and in some cases action.

The distinguished early botanist John Ray (1627-1705), who is credited with some proficiency in French and Italian, studied in Italy and botanised widely in Europe. He came to know many leading European botanists, some of whom visited these shores. This enabled him to base his works on the flora of north-west Europe (Pearman, 2017). The similarities and differences in the floras of Ireland, Britain and our European neighbours continue to stimulate visits and exchanges of information between botanists. An interest in how our flora relates to that of our European neighbours, and beyond, is a good reason to give more attention to those species which are relatively common here but nowhere else.

Acknowledgements

I am very grateful to David Pearman for his encouragement and comments on my drafts. David plans to write in more detail on this subject in a future edition of *BSBI News.*

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Dryopteris affinis ssp. *kerryensis* – new to the British flora, and possible wider distribution in Ireland

ROGER GOLDING

A small group from the British Pteridological Society (BPS) has been working on updating and expanding the field guide *Some Taxa within the* Dryopteris affinis *complex* (Trewren *et al.*, 2014), which was based largely on the work of the late Ken Trewren (KT).

Current understanding of the *Dryopteris affinis* (Golden-scaled Male-fern) complex has developed from morphological, chemo-taxonomical and chromosome studies. The various taxa in the group are diploid or triploid, and reproduce apomictically. They may also hybridise with sexual *Dryopteris* taxa, most frequently with *D. filix-mas* (Male-fern), giving rise to tetraploid and pentaploid hybrids. They are generally assumed to be derived from the ancestral crossing of two or three distinct genomes in different combinations. Candidates for the origin of these genomes include *D. oreades* (Mountain Male-fern), *D. caucasica*, and a sexual ancestor of *D. wallichioides*, although others have been suggested. Many of us have felt for a long time that, without significant DNA work, the genome composition, relationships between taxa, and even whether to classify them as species, subspecies or variety, will continue to be subject to a high degree of uncertainty, debate and frustration. So far, only very limited DNA work has been carried out (see, for example, Jessen *et al.*, 2011).

Paul Green with an unusually large specimen of *Dryopteris affinis* ssp. *kerryensis*, Co. Waterford, Ireland. *Roger Golding*

With the potential of collaboration with an appropriate researcher on the DNA work, we began developing an experimental framework and to collect samples for DNA testing in the spring and summer of 2017. Samples submitted for DNA testing need to be fully documented and, so far as possible, assigned to known types, backed up with chromosome counts and other means of technical confirmation, such as spore and stomata guard cell measurements, where possible.

An aspect needing clarification was the identity and status of some plants from Ireland and Wales, including one or more taxa with dark scales, provisionally identified by Christopher Fraser-Jenkins (CF-J) and KT, but never formally described. CF-J gave the provisional name of '*wallichioides*' to one of these plants, although KT subsequently used other names for what is probably the same taxon. In order to investigate this, I spent much of July 2017

Dryopteris affinis ssp. *kerryensis*, type location, Co. Kerry, Ireland. *Roger Golding*

Dryopteris affinis ssp. *kerryensis*, Co. Limerick, Ireland. *Jim Dennison*

in Ireland, having previously arranged to join field meetings of the BPS and Wild Flower Society, looking at various sites on the west coast and in the south. Several of the sites I visited in the south and south-west had previously been visited by CF-J and KT.

Ssp. *kerryensis* in Ireland

I also volunteered to collect material of *D. affinis* ssp. *kerryenis* for DNA testing. At the same time I wanted to understand what seemed to me to be inconsistencies and contradictions in published descriptions of *kerryensis*. The main published descriptions are Jermy & Pigott (1997), Fraser-Jenkins (2007), Stace (2010), Trewren *et al*. (2014) and, more recently, Sell & Murrell (2018). Having studied a range of plants, I came to a preliminary, and very tentative, conclusion that there may be two potential taxa 'hidden' within the current idea of ssp. *kerryensis*. For convenience, I refer to these as c-type *kerryensis* and d-type *kerryensis*, c standing for *cambrensis*-like and d for dark-scaled, referencing aspects of descriptions in some of the published accounts (Fraser-Jenkins, 2007; Trewren *et al*., 2014). My c-type *kerryensis* is the 'type' form of the subspecies, corresponding to plants at the type location in Co. Kerry (v.c.H1), a roadside between Tahilla and Rossdohan, first described by CF-J (Widén *et al*., 1996), as *D. affinis* ssp. *affinis* var. *kerryensis* (see photograph above left).

According to CF-J (Fraser-Jenkins, 2007), ssp. *kerryensis* occurs in vice-counties H1 (South Kerry), H2 (North Kerry), H3 (West Cork), H4 (Mid-Cork), H5 (East Cork), H6 (Waterford), H7 (South Tipperary) and H16 (West Galway). However, until recently, no records for ssp. *kerryensis* have appeared on the BSBI maps.

Not long before the trip, Jim Dennison contacted me, regarding a probable ssp. *kerryensis* from Co. Limerick (v.c.H8), and he later gave me a sample frond when we met up in Ireland. This plant falls broadly within the description of ssp. *kerryensis* in

Trewren *et al*. (2014) and Fraser-Jenkins (2007), although it is a less good match when compared to Jermy & Pigott (1997) or Stace (2010), as it has rather darker scales than typical. It is a good example of minor variation within the c-type form (see above).

On a visit to Ardnamona Wood, in East Donegal (v.c.H34), as part of the BPS field meeting, two plants were found, which I classify as the d-type form of ssp. *kerryensis*, having much darker scales and a subtly different morphology. Further south, at two sites in Connemara (West Galway, v.c.H16), I found a confusing spectrum of *D. affinis* types, including both c-type and d-type *kerryensis* forms. The first site was a roadside in mixed woodland near Ballynahinch Castle, and the second an area of old native woodland in the middle of a coniferous plantation, beside Derryclare Lough, east of the Twelve Bens.

In Co. Kerry, the Torc Waterfall area (North Kerry, v.c.H2) has a similar confusing variety of forms. This is one of CF-J's and KT's key sites. In 2009, when preparing for an earlier trip to south-west Ireland, KT warned me that in attempting to identify ssp. *kerryensis*, there were 'at least' two other as yet undescribed taxa in that area; one of these is a form provisionally called '*wallichioides*' by CF-J; the other is probably the form I call d-type *kerryensis*. Just to confuse matters even more, there is a very dark-scaled form of *D. borreri* that occurs here and in other parts of Ireland, which has some superficial characters in common with d-type *kerryensis*!

This is just a brief snapshot of some of the sites I visited. My preliminary conclusions are that ssp. *kerryensis* in the wider sense, if understood to include a range of forms encompassing both my c-type and d-types, is more widespread in Ireland than previously thought, occurring as far north as Donegal, in the west. I was able to confirm that the type form is at least as widespread as noted by CF-J, occurring as far north as Co. Galway and east as far as Co. Waterford (KT had also recorded it in Co. Waterford, but the specific locations were not known to the County recorder; fortunately, I had the benefit of KT's database to work from and we were able to find these sites). Jim Dennison's Limerick site is a new county record.

There is not room here to include a full description of ssp. *kerryensis* and the range of variation so far encountered (see references; also more information will appear in due course on my website: http://www.rogergolding.co.uk/ferns). It is worth noting, however, that the majority of plants tend to be of rather small size, compared to ssp. *affinis* and *D. cambrensis* (Narrow Male-fern). This may be in part owing to relatively slow growth. I have a plant in my garden, now around eight years old, the largest fronds of which are around 80cm in length, compared to around twice that length in an equivalent age ssp. *affinis*. However, one clearly very old, multi-crowned clump in Co. Waterford (v.c.H6) is of much larger size, with fronds close to 150cm in length. This is, by a considerable margin, the largest I have seen (see opening photograph). At this site there is also a very large plant of what is clearly the hybrid between ssp. *kerryensis* and *D. filix-mas*, which has not yet been formally described (although it is listed in Trewren *et al*., 2014 as *D.* × *complexa* 'nothosubspecies *hibernica*').

Because of the uncertainty of the circumscription of ssp. *kerryensis*, I believe there is a need for much more research on these plants. I would be interested to see specimens of potential ssp. *kerryensis* that appear to match the published descriptions, from Ireland or, indeed, elsewhere. A recent find of a very dark-scaled *D. affinis* group plant in East Sussex (v.c.14) may be another example of my d-type form, but more work needs to be done on this.

Ssp. *kerryensis* in England

In late August 2017 I made a trip to Cumbria to revisit some locations where I had previously seen populations of *D. affinis* group ferns needing more study. Late in the day on a walk through Ennerdale (v.c.70), I was surprised to see a group of plants that appeared to match the type form of ssp. *kerryensis* (photograph p. 16).

I took samples and compared them with those from Ireland, and found that not only do they accord with the descriptions of ssp. *kerryensis*, but also are a very good match to those from the type location. On a return visit in early October, I was able to spend several hours in the area, and found more plants. The total number so far identified is probably around 20–30, but I have not yet done an accurate count. Most of the population is within a single tetrad, but with outliers in two neighbouring tetrads. Once seen they are very clearly distinguishable from local populations of other *D. affinis* types, including *D. affinis* ssp. *affinis, D. affinis* ssp. *paleaceolobata*, *cambrensis*, *borreri* and *lacunosa*, (the last not yet formally accepted in the

British flora), all of which occur in the vicinity.

This is the first time ssp. *kerryensis* has been found in England or, indeed, anywhere outside the Republic of Ireland. The majority of the plants found so far are on a south-facing bank and ditch beside the main track leading up the valley. On the second trip I spent around two hours searching the woodland to the north of the track, but found only two plants there, some distance from the main colony. And no plants so far on the south side of the valley. I suspect, however, that more will be found in future – there is a lot of territory to search.

Dryopteris affinis ssp. *kerryensis*, Ennerdale, Cumbria. *Roger Golding*

The main site itself is potentially rather vulnerable, as the banks and ditch presumably may be re-excavated at intervals to maintain drainage. That could potentially wipe out most of the currently known plants. However, as previously stated, it is almost certain more plants will be found. Also, the more mature specimens are highly fertile, so it is likely there is a substantial spore bank built up in the soil, which would hopefully give rise to new plants in the event of disturbance to the habitat.

It is clearly of importance to establish the true extent of this population; I hope to revisit the area to carry out further studies. The possibility of additional sites, both in Cumbria and elsewhere, should also be borne in mind, especially in the wetter and milder areas of western Britain.

Acknowledgements

I particularly want to thank BSBI recorders Clare Heardman, in Co. Cork, and Paul Green, in Co. Waterford, for their help; and also Alison Evans and Tony Church for their dedication in keeping the *D. affinis* project moving along.

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Diapensia lapponica – a response to Simon Harrap

MICHAEL SCOTT

I was honoured, I think, to be mentioned twice in the April 2018 issue of *BSBI News*. I was grateful that Peter Marren, in his article promoting his wonderful *Chasing the Ghost* (Marren, 2018) did not reveal that I was the old guy whose dodgy knee stopped him struggling into the inner fastnesses of the Skye corrie where *Arabis alpina* (Alpine Rock-cress) clings to survival.

I am less sure about the comments by Simon Harrap in his article on *Diapensia lapponica* (Diapensia) (Harrap, 2018). He states that a theory about the origins of the plant, which I discussed in my *Mountain Flowers* book (Scott, 2016), 'should never have been put into print'. What happened to the spirit of scientific enquiry? His main concern seems to be that even a suggestion that the plant might not be native would deny it legal protection. That might be a valid concern if he could tell me what possible benefits *D. lapponica* has had from legal protection on its remote hillside; it certainly does not seem to have unlocked any fresh funding for research into its puzzlingly limited distribution.

Despite his concern for conservation, I notice that Harrap names the hill on which the *D. lapponica* grows, as did the BSBI itself in the *BSBI Scottish Newsletter* Spring 2018 issue, but which neither Peter Marren in his book, nor I in mine, did. Three decades ago, revealing the site would have been enough to have the authors drummed out of the BSBI. Readers of my age might remember the huge controversy over Fisher (1991), which was basically a how-to-find-it guide to Britain's rarest plants. The BSBI Conservation Committee wrote to the book's author stating that the book was contrary to the BSBI's objective to promote the conservation of the British flora, and in response the author resigned from the BSBI (Perring, 1991). Times have changed, and I am not for a moment suggesting that naming the *D. lapponica* hill threatens the plant's survival there, but I chose not to specify the hill in my book in the hope that this would encourage readers to explore the Glenfinnan area more widely, and perhaps in the process find another site for the species.

Harrap partially quotes my conclusion that *D. lapponica* 'is most probably a remnant from the Ice Age whose continued existence at its last remaining site is the result of chance and [what I describe in the book as] the "chequerboard theory"', but he did me the discourtesy of not quoting the line which follows: 'until someone can identify some special feature of the Glenfinnan site to explain its survival there'. That line explains why I chose to put 'the commando theory' into print. I wanted to encourage more discussion and more research into the survival of *D. lapponica* in Scotland. Perhaps I should therefore welcome Harrap's article as a contribution to that debate.

Origins of the 'commando theory'

In that spirit, may I respond to some of the points that Harrap raises? Firstly, may I emphasise that I did not originate the hypothesis that *D. lapponica* might have been introduced accidentally on the boots of Norwegian paratroopers during World War II. The idea came from Alf Slack, a keen botanist and doughty hillwalker who was the botanical recorder for Westerness (v.c.97) from 1969 until his death in 1998. He visited the *D. lapponica* site just a year after its discovery by C.F. Tebbutt in 1951, but then did not return until 1979. In conversation at a BSBI Scottish Annual Exhibition Meeting, he told me that he was amazed how much the plant seemed to have spread over the intervening 27 years (although he admitted this was a subjective assessment, with all the flaws of memory that can result). He speculated whether this apparent spread might point to a more recent origin and noted that wartime training exercises by Norwegian paratroopers in the area could offer one possible mode of introduction.

Initially, like Harrap, I dismissed the notion, but it stuck with me. Since I first saw *D. lapponica* in Scotland, I have been fortunate to find it on Mount Washington in New Hampshire, USA, and at three sites in Greenland, but seeing it there only makes it more difficult for me to understand why it survives at just its one Scottish site. That is why, in compiling my book, I revisited Alf Slack's suggestion. I expected to

be able to dismiss it quickly, but in fact I discovered that Norwegian soldiers, recruited into the wartime Special Operations Executive, had indeed trained in the area around Glenfinnan Lodge and went 'tramping over heather' on the surrounding hills. The seed capsules of *D. lapponica* are recorded in Norway projecting above the snow, dispersing seeds which are then wind-blown. It was therefore not impossible that seeds might have become embedded in the treads of Norwegian commando boots, during exercises there, and then been deposited from them over the Scottish hillside where the *D. lapponica* was found in 1951.

The first botanists to visit the site, a month after Tebbutt's discovery, found 'several hundred specimens of the plant' (Roger, 1952) and I accept that it is extremely unlikely that the plant could have spread so rapidly in less than a decade after its potential introduction, but it is not unknown for new, well-adapted species arriving in open habitats to become highly invasive. Harrap quotes Preston *et al.* (2002): 'The population (currently about 1200 clumps or mats) and the area it occupies have not changed markedly since the discovery of the species in 1951'. I am not aware of any objective monitoring to confirm the latter assertion. Alf Slack certainly thought it had spread since 1951, and '1200 clumps or mats' sounds rather more than Roger's 'several hundred specimens' recorded in 1952.

Other sites

The discovery of *D. lapponica* at other sites would certainly help contradict the 'commando theory', which is why, in my book, I tried to encourage readers to explore more widely in the west Highlands, rather than returning over and over again to well-known sites. I can respond to Harrap's request for a published correction to the now discounted 'second site' for *D. lapponica* reported from the Loch Quoich region (Craven & Craven, 1977). The identity of the plant found by the Cravens was confirmed from their colour slides by Franklyn Perring, who was a highly distinguished botanist but had the unfortunate disadvantage of being red-green colour blind. Lynne Farrell subsequently reviewed the slides and had no doubt that they showed the pink flowers of *Loiseleuria procumbens* (Trailing Azalea), but by then a letter had been sent to the Cravens with the wrong identification, hence the subsequent confusion. I am grateful to Margaret Perring and Lynne Farrell for their approval to publish this correction to the 1977 record.

Harrap queries my comments on the *D. lapponica* photographed in 2007 by Angus MacIntyre on Sithean Mor, 16km to the west of the known site, but which could not subsequently be refound in either 2008 or June 2015. I wrote that this discovery 'could easily fit with a plant establishing briefly from windblown seed, or carried from Glenfinnan on a hillwalker's boot, but swiftly dying at an unsuitable site'. Harrap writes that this does not accord with the observation that the average age of first flowering of *D. lapponica* in Swedish Lapland is 18 years and he suggests that this contradicts my speculation about a swift death at an unsuitable site.

Unless the plant can be refound in the rugged terrain around Sithean Mor, the only other explanation would be that *D. lapponica* had survived there since the end of the last Ice Age, and then promptly died out within a few years of its discovery, which would seem an extraordinary coincidence. As for taking 18 years to flower, I bought a small garden-origin plant of *D. lapponica* from Ardfern Nursery at Bunchrew, near Inverness, in July 2004. I doubt this would have been pot-grown for more than a couple of years before I bought it, yet it flowered beautifully in May 2007. Of course, our garden a few metres above sea-level in Wester Ross is not Swedish Lapland – but then neither is Sithean Mor, nor the Glenfinnan site for that matter, and that is the whole point I was trying to make in the book.

The need for more study

We desperately need a good autecological study to understand the growth and requirements of *D. lapponica* in Scotland, and hopefully in that way to explain why it has such a restricted distribution. The very valuable, but unpublished report, by Dr Alistair Headley of the University of Bradford (Headley, 1999), which Harrap quotes from my book, would be a good starting point, if only it could be repeated on a larger scale and over a longer period. Headley's hugely demanding survey, which was part-funded by the BSBI Scientific Committee, involved carrying 31kg of kit 690m up the hill each day. He used an instrument called a Geodimeter EDM to precisely locate and map the position of 224 cushions of *D. lapponica*. His data is still available and resurveying these plants would give a valuable indication of their

survival rates. During the 1996 visit, Headley also precisely measured the largest length and breadth of 20 plants, each of which was marked with a small aluminium disc to allow resampling. Eight of these plants were refound in a return visit in 1997, but only four of the eight could be refound and remeasured in 1999. The four plants showed a maximum radial growth of 3.2cm, more than five times the rate recorded in Norway (Molau, 1996).

Extrapolating from this figure, Headley estimated that most of the 195 *D. lapponica* cushions he had measured (but not marked with relocator discs) were between 19 and 50 years old, but the oldest might have been 150 years old. This conclusion would clearly contradict the 'commando theory'. However, given the vicissitudes of Scottish weather, I am unconvinced that we can safely extrapolate a growth rate over 3 years as typical for a 50 year period, and I question whether a sample size of just four plants would be statistically significant. In estimating the age of cushions, Headley also assumes that the cushions grew at a constant rate from the moment of germination. Gardeners will know that many plants in cultivation grow quickly when planted out first, then more slowly once they have become established. Certainly, my garden *D. lapponica* grew from an initial small tuft to a diameter of around 15cm within a year of planting, but then seemed to struggle and did not expand much further. In the garden, it became a constant battle to extract grasses and other 'weeds' that interposed themselves between the spreading stems of the *D. lapponica*, which broke all too readily if handled roughly, and I suspect that the exclusion of ranker-growing species is a significant environmental factor at its Scottish site.

Diapensia lapponica growing on a rocky bank in Nuuk, Greenland. *Michael Scott*

Headley's work is hugely valuable, but, in my opinion, is not yet sufficiently definitive to absolutely disprove the 'commando theory'. I feel that more research, building on his work, is still required. As Headley found, studying the population of *D. lapponica* at such a remote location is difficult and time-consuming, but I hope that the debate stirred up by Simon Harrap's article and my response here might be enough to persuade some institution or individual to unlock the resources needed for a detailed study of *D. lapponica* on what remain its sole Scottish site.

Scottish Natural Heritage has set up photo-monitoring plots which the local VC recorder Ian Strachan has repeated, but the outcome of these has proved complex to analyse (I. Strachan, *pers.comm.*).

I hope the two articles might also encourage BSBI members to search for the species more widely at similar sites in the north and west Highlands. Sixty-seven years after its discovery, we really could do with understanding why this intriguing plant appears to grow only on one, otherwise undistinguished ridge in the western Highlands.

Since drafting this article, I was fortunate to revisit Nuuk, the capital of Greenland, on 30th June this year, and found the plant beautifully in flower on a rocky bank in the centre of the city (see photographs). I had previously found it in quantity on the outskirts of Nuuk. The plants I found were along a rough informal path used by locals for access from the road to one of Nuuk's unimposing apartments blocks. I assume trampling helps maintain an open habitat in which *D. lapponica* can flourish, but I cannot help noting that the location might also be consistent with seed transportation on human footwear.

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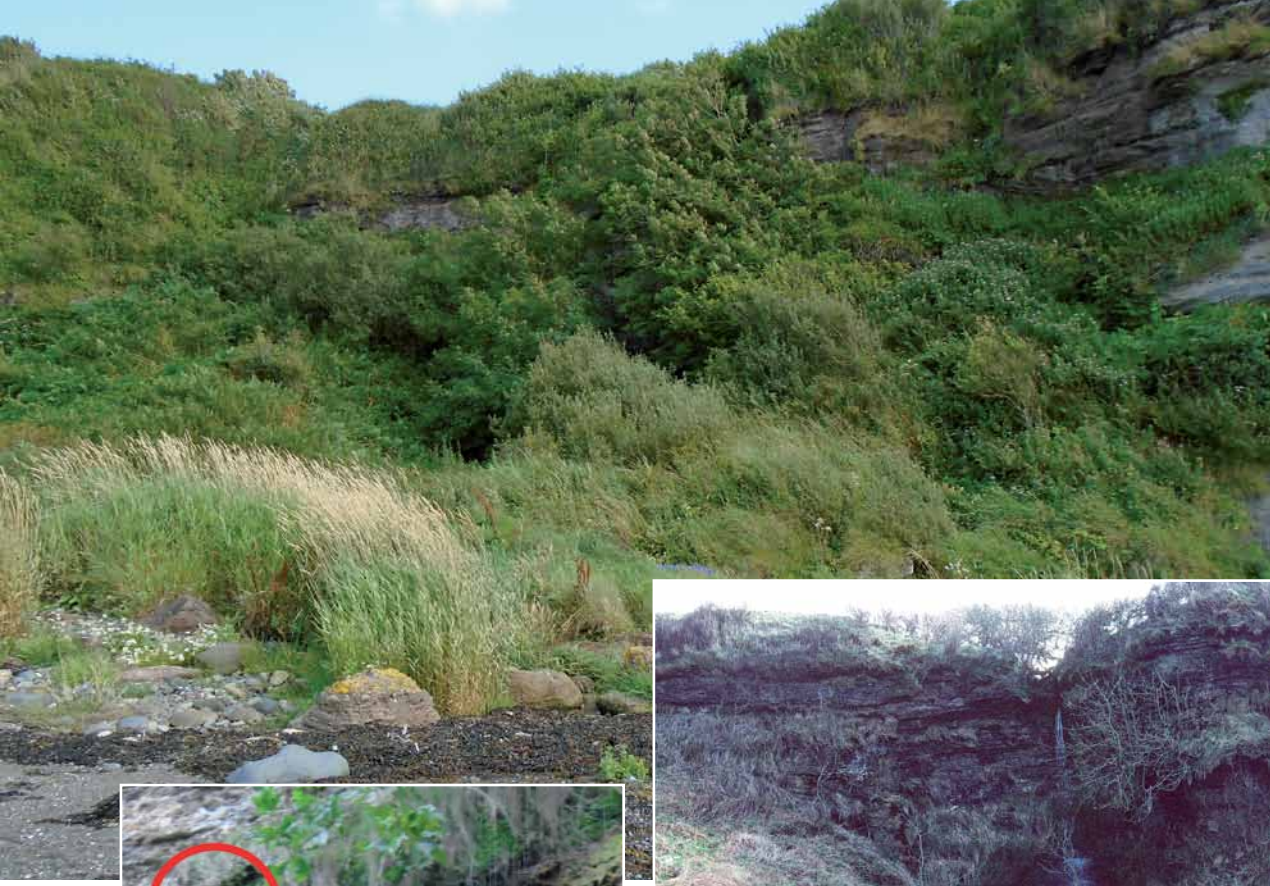
The coastal site for *Saxifraga aizoides* (Yellow Saxifrage) in Ayrshire (v.c.75)

R.W.M. CORNER

In April 1983, while staying at Ballantrae, I took the opportunity to look for *Saxifraga aizoides* (Yellow Saxifrage) which had an isolated pre-1930 hectad dot for NS21 in Ayrshire in the first BSBI Atlas. It seemed to me that the best place to look was on the coast, so I walked down the track from the Heads of Ayr Caravan site to Bracken Bay. I had not walked far along the beach before I came to a cliff with a small waterfall, where I soon spotted the *S. aizoides.* There were some 12 small cushions scattered in ledges and niches on the face of the near vertical wet sandstone cliff about 10m high to the left of the waterfall. I was able to get a close-up photograph of a lower plant and noted that plants higher up the cliff had the remains of old inflorescenses where *Sedum rosea* (Roseroot) was an associate.

I was not able to make a return visit to the site until 33 years later on 9th August 2016, when having a family holiday near Ballantrae once more. Coincidentally, David Lang's Rare Plant Register for Ayrshire (v.c.75) had just been published on the BSBI website and on checking through it, *S. aizoides* was thought to be extinct here. This gave added impetus to my return visit, so in the company of my daughter and with a much-reduced level of agility, we took the track down to the shore at Bracken Bay. I did not recognise the stretch of cliff at all as it was masked by tree growth but I could hear the sound of running water so it seemed to be the likely spot. With some effort, we managed to negotiate the initial boulders and scrub and reached the more open conditions at the base of the cliff with the small waterfall. A mass of *Eupatorium cannabinum* (Hemp-agrimony) along the base made viewing the rock face with binoculars awkward. After



Main photograph Cliff at Bracken Bay on 9th August 2016.
Above The same cliff on 14th April 1983.
Left *Saxifraga aizoides* plants, circled in red, on the cliff face on 9th August 2016. *Rod Corner*

a short period of scanning, however, I was delighted to see the yellow flowers of *S. aizoides* scattered as small plants over quite a wide area of the vertical wet cliff face to the left of the waterfall. We counted about 13 small flowering cushions compared with a count of 12 in 1983. If they had not been in flower, the saxifrage could easily have been overlooked. The grid ref. was NS 28081 18211; alt. 10m.

On my first visit, it was possible to access some of the plants and I photographed them easily, whereas on this occasion the flowering plants were too high up and difficult to spot, even with binoculars, through the rank growth of *Eupatorium cannabinum*. *Sedum rosea* was a close associate in places, with good-sized clumps in the drier areas on the upper parts of the cliff. Indeed, it extended over a much wider area and some could be viewed above the young trees from the beach itself.

Other species noted on this section of cliff were *Campanula rotundifolia* (Harebell), *Pinguicula vulgaris* (Common Butterwort) and two large clumps of *Plantago maritima* (Sea Plantain) at the north end, and a few plants of *Rubus saxatilis* (Stone Bramble) to the right of the waterfall. The following occurred at the base of the cliff: *Angelica sylvestris* (Wild Angelica), *Brachypodium sylvaticum* (False Brome), *Chrysosplenium oppositifolium* (Opposite-leaved Golden-saxifrage), *Corylus avellana* (Hazel), *Crepis paludosa* (Marsh Hawk's-beard), *Dryopteris affinis* (Scaly Male-fern), *Festuca*

Saxifraga aizoides, Bracken Bay, April 1983. *Rod Corner*

rubra (Red Fescue), *Fraxinus excelsior* (Ash), *Geranium robertianum* (Herb Robert), *Heracleum sphondylium* (Hogweed), *Oenanthe crocata* (Hemlock Water-dropwort), *Asplenium scolopendrium* (Hart's-tongue), and *Salix cinerea* ssp. *oleifolia* (Grey Willow). On the driest parts, *Urtica dioica* (Common Nettle) and *Hedera helix* (Ivy) were common.

Other records

The first reference I have found to the saxifrage in Ayrshire is 'Rocks, Dunduff-shore' in a list of plants made by James Smith of Monkwood for the Parish of Maybole (Gray, 1845). H.C. Watson in his *Cybele Britannica* of 1847 stated the following: 'The *S. aizoides* is very scarce in the midagrarian zone; but I feel necessitated to consider it as an inhabitant of that zone since it was discovered by Dr P.W. Maclagan on the coast rocks of Ayrshire.' He goes on to give other relatively low-level sites in the British Isles: Sutherland, and below '100 yards in Cumberland'. In his later work, Watson (1883) again credits its occurrence in Ayrshire to Maclagan.

Philip Maclagan was part of a very distinguished family described as a 'dynasty', with brothers prominent in medicine, the church and the army (Doyle, 2010). It would seem likely that Maclagan discovered the saxifrage as a schoolboy, as his mother's family came from the nearby town of Ayr and he pursued his love of botany from an early age. He eventually became a much-revered General Medical Practitioner in Berwick-upon-Tweed. The late Alan Stirling (Stirling, 1994), a previous BSBI recorder for Ayrshire, also refers to this site.

In 2016, a search of the cliffs along the coast to the south, especially at the site of a larger waterfall, failed to reveal any more of the saxifrage, although *Sedum rosea* did extend a short distance in this direction. Elsewhere in Ayrshire, Bryan Simpson, a previous BSBI recorder for the vice-county, stated in a letter to me dated April 1982 that he had recorded it recently from a gravelly wet flush (basalt) at 700-800 feet in the hills above Largs. David Lang, the current recorder, (pers. comm.) noted that it had been recorded in these hills for the last Atlas, but that it had not been seen since the 1990s.

However, in 2017 it was recorded by Angus Hannah at the most northern extremity of Ayrshire on the south side of the Kelly Burn on the Renfrewshire border. There was a small, viable population on a steep, flushed slope at an altitude of 180m. (A. Hannah, pers. comm.). Keith Watson (Watson, 2013) recorded it as being very rare in Renfrewshire (v.c.76), where it occurred along the Glenshalloch Burn in small, basic flushes in two monads in 2001. These and the coastal one under discussion here are the only extant sites known for *S. aizoides* in mainland Scotland south of the Central Belt. The record dated 1843 in *the Flora of Dumfriesshire* by G.F. Scott-Elliot (1896) is given as 'doubtful and can be discounted'. Similarly, Isa Martin (1934) gave it as present in 'Pentland streams', but I think she was being overly optimistic. Mistaken identity also accounts for erroneous records from the Moffat Hills. *S. aizoides* therefore appears to have only a toehold in the south of Scotland in this north-western corner of Ayrshire and Renfrewshire.

This Ayrshire coastal site habitat is a refugium for *Saxifraga aizoides* and a classic relict site with comparisons for species of open habitats elsewhere in the British Isles (Pigott & Walters, 1954). The nearest sites for *S. aizoides* in northern England are the isolated relict populations in the Irthing Gorge, north of Brampton, in Cumberland, v.c.70, 145km to the south, where it occurs on the impressive high, wet, basic sandstone cliffs on the River Irthing above Gilsland and upstream below cliffs on the Northumberland side at Cramel Linns (v.c.67). *Sedum rosea* is absent from there. These are isolated sites with no further occurrences to the south until the Shap Fells, Upper Teesdale and the Lake District. It is absent from Wales. In 1967, I recorded a similar relict population from a cliff above the south bank of the River Almond upstream from Millhaugh, Perthshire (v.c.87) NN 99.29; alt. 105m., where it was too high above the river to have been washed down from upstream.

Refugia for *Saxifraga oppositifolia*

It is of note that this type of relict habitat or refugium also supports its rarer relative, *Saxifraga oppositifolia* (Purple Saxifrage), in the south of Scotland, where it is known from three sites. It is present on the impressive cliffs at the foot of the Grey Mares Tail waterfall in the Moffat Hills (v.c.72), where it was discovered by the Rev. W. Singer in 1843 (Scott-Elliot, 1896). It is also present on the similarly impressive high, wet, basic cliffs at the lowland (150m alt.) Falls of Clyde in Lanarkshire (v.c.77), first 'picked' there by a Mr Gourlie in 1843 on one of Professor J.H. Balfour's noteworthy student field meetings (Macpherson, 2016). Watson (1883) stated 'Lanark planted?' against this record, but there is no doubting its native status there, as judged by the associated species such as *Asplenium viride* (Green Spleenwort), and it is mentioned together with a photograph of its cliff habitat in Crawford (2008). The third site was added by my friend, the late Hugh Lang, who found it in small quantity at 700m. alt. in a different ground-level flush habitat on the Merrick in the Galloway Hills (v.c.73) in 1973. It is intriguing why *S. oppositifolia* has survived in these sites and not *S. aizoides*, whose habitat preferences are rather similar, although *S. aizoides* is more tolerant of wetter conditions and is less base demanding (Hill *et al.*, 1990). It would appear that *S. aizoides* did once occur in the Galloway hills in the early post-glacial period some 10,000 years ago, as its pollen grains were detected by H.J.B. Birks (pers. comm.) and recorded in Godwin (1975) from Loch Dungeon and Cooran Lane.

Looking to the future

It is difficult to say if the Bracken Bay population of *S. aizoides* has decreased over this recent period. Although the number of plants seemed much the same, my inability to get close to any plants near the base of the cliff perhaps showed that it may have lost some ground there. The lush growth of *Eupatorium cannabinum* and the shading effect of the young trees could be a factor in the loss of plants. The cliff, however, appears to be high enough to allow the saxifrage to survive out of reach from this competition. It seems to flower well and the population presumably maintains itself locally from seed. It may well be safer here than in the moorland flush habitats elsewhere in the area, which can be very vulnerable to over-grazing. I have witnessed the extinction of this saxifrage over the past few decades from basic gravelly flushes, near Orton, and from the eastern Lake District in Swindale, near Shap, both in Westmorland (v.c.69).

In spite of climatic warming and increasing competition, I would consider that these coastal cliff plants would continue to survive here. Although facing west and close to the shoreline, the effects of any wind-borne salt spray appear to be negligible. It was probably widespread in this part of Scotland at one time and further small populations probably still exist in the hills above Largs. It would be of great interest to monitor the performance of *S. aizoides* in this readily accessible site over the coming years.

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The return of *Rhynchospora alba* to Astley Moss, South Lancashire (v.c.59)

JOSHUA STYLES

Rhynchospora alba (White Beak-sedge) is an indigenous member of the Cyperaceae. Stace (2010) gives the species as being native to acid and peaty places locally, and is largely distributed throughout the west of Britain and Ireland. Within South Lancashire (v.c.59), *R. alba* has been documented as extinct for over a century, with the last record being from 1883 at Simonswood Moss. *Travis's Flora of South Lancashire* (1963) gives *R. alba* as 'Extinct: formerly frequent'. In a national context, *R. alba* is listed as being of 'Least Concern' in Britain and 'Near-Threatened' within England (Stroh *et al*., 2014).

On 5th July 2018, I paid a visit to Astley Moss, a Site of Special Scientific Interest (SSSI) and a Special Area of Conservation, with Mark Champion of the Lancashire Wildlife Trust. The mossland is part of a network of the Greater Manchester peatlands that has been re-wetted in recent decades by Lancashire Wildlife Trust in cooperation with Natural England and other conservation bodies. The purpose of this visit was to assess suitability of the re-wetted mossland for the reintroduction of a suite of peatland species that were once frequent in the region, one of which was *R. alba*, and was undertaken as part of the North-West Rare Plants Initiative (NWRPI). Upon inspection of the more favourable areas of the mossland within a locality where *Drosera rotundifolia* (Round-Leaved Sundew) was most frequent, to my amazement, I came across two flowering plants of *R. alba* (see photograph). The plants were amongst a relatively dense thatch of *Eriophorum angustifolium* (Common Cottongrass) leaves. After inspecting the plants, the surrounding vegetation and contacting the Natural England case officer, Paul Thomas, it became apparent that these two specimens of *R. alba* had not been planted and that they had most likely arisen from an existing seed bank. It may also be likely that further plants exist on other, more inaccessible, parts of the mossland.

By total coincidence, three weeks prior to the species' discovery at Astley, I had been involved in the reintroduction of *R. alba* onto Risley Moss (SSSI and Local Nature Reserve), as part of the NWRPI. The plants on Risley Moss have been sourced from Abbots Moss SSSI (Cheshire v.c.58), and planted into three distinct plots following permissions issued by all relevant parties, including Natural England.

Rhynchospora alba plants at Astley Moss, July 2018. *Mark Champion*

The future of *R. alba* within the Greater Manchester mosslands complex now appears to be rather more favourable and populations will continue to be monitored.

To find out more about the NWRPI, see www.nwrpi.weebly.com.

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A new location for × *Beruladium procurrens* (Apiaceae) at Carlton Marshes, Suffolk

ALAN C. LESLIE & STUART D. DESJARDINS

x *Beruladium procurrens* at Chippenham Fen, 2018. Note the presence of bracts. *Peter Leonard*

× *Beruladium procurrens* A.C. Leslie (Apiaceae) is an intergeneric hybrid between *Berula erecta* (Huds.) Coville (Lesser Water-parsnip) and *Helosciadium nodiflorum* (L.) W.D.J. Koch (= *Apium nodiflorum* (L.) Lag.; Fool's Water-cress). The hybrid was discovered at Chippenham Fen, Cambridgeshire, and subsequently confirmed by molecular and cytological analyses. Morphologically it can be distinguished from *B. erecta* by the absence of the characteristic ring-mark on the petiole below the lowest pair of leaflets, and from *H. nodiflorum* by the presence of (1)2-5 bracts and/or peduncles that vary from very short to longer than rays (Desjardins *et al.*, 2015).

Here we note a new location for this hybrid at Carlton Marshes, a nature reserve in the Waveney Valley, Suffolk, just to the west of Lowestoft. This new discovery was made following a tip-off from Paul Stanley to investigate some intriguing plants growing on the Marshes, and in August 2016 ACL visited the reserve and found a substantial population of × *Beruladium procurrens*. It is abundant in several ditches (e.g. TM5058.9198), with just a little of both parents. In terms of habit, leaf form, bract number, variation in peduncle length, general floriferousness and seed sterility it is just what one might expect (*c.f.* Desjardins *et al.*, 2015).

To verify this record a leaf sample was taken from one of the patches and sent to SDD at the University of Leicester for genetic analysis. Total genomic DNA was isolated from the leaf sample, and two markers were analysed: a biparentally-inherited nuclear marker (the ITS) and a maternally-inherited chloroplast marker (*rps16-trnK*). The sequence of the nuclear marker was mixed and revealed clear genetic contributions from both parents, *H. nodiflorum* and *B. erecta*, while the sequence of the chloroplast marker showed that *B. erecta* was the seed parent, which is the same direction of hybridisation as the Chippenham specimen.

Taken together the morphological and molecular determinations confirm that Carlton Marshes is a new locality for × *Beruladium procurrens*, and it seems highly likely that it is under recorded, and may well be present on other marshes in East Anglia. Indeed, in 2017 Paul Stanley reported a further site in a

pond and stream ditch, in a clearing in fen woodland at North Cove, Barnby, Suffolk (TM470.907) just over two miles west of the Carlton Marshes locality. There is also the potential historical record previously identified from Upware, Cambridgeshire, 11th August 1857, C.C. Babington s.n. (**CGE**), which is around ten miles west of Chippenham Fen (Desjardins *et al.*, 2015).

Further afield, there is a herbarium specimen from Luffness, Haddington, East Lothian, Scotland, 6th August 1910, M. Cowan Jr. s.n. (**CGE**), which has previously been highlighted as a likely candidate (Desjardins *et al.*, 2015). Another herbarium record has also recently been unearthed in **CGE**: near Totland, Freshwater Marsh, Isle of Wight, 20th September 1906, E.W. Hunnybun, but recent searches in this area by Paul Stanley have proved unsuccessful; the area is reported to be considerably reduced in interest as a result of scrub encroachment and a lower water table.

BSBI members are encouraged to be on the lookout at sites where the parental species grow together, as we would be very interested to hear about any new sightings.

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Gentianella uliginosa (Willd.) Börner does not occur in Scotland

TIM RICH & LIZ LAVERY

Rose (1998) reported discovering *Gentianella uliginosa* (Dune Gentian) in Colonsay in 1978, new to Scotland. The populations have been monitored regularly by Scottish Natural Heritage (e.g. Gulliver, 1998), but during monitoring in 2007, LL had difficulty separating potential *G. uliginosa* plants from *G. amarella* (Autumn Gentian), which was also present. As Noel Pritchard (BSBI *Gentianella* referee) had already communicated to TR that he no longer considered the Colonsay plants as *G. uliginosa* (pers. comm., 2001), this has led us to re-examine these populations.

Fourteen floral and vegetative characters were scored for Colonsay plants, *G. uliginosa* from South Wales and Europe and British *G. amarella* (vouchers for Colonsay are in **NMW**).

A Principal Components Analysis (PCA) was carried out using PAST3 (Hammer *et al.*, 2001). Component 1 accounted for 72% of the variation with the main loadings derived from vegetative characters and component 2 accounted for 9% of the variation derived from floral characters. Fig. 1 shows clearly that all the Colonsay material fits within *G. amarella* and not *G. uliginosa*.

Original material collected by F. Rose (**ABN**) and later by R. Gulliver (**NMW**, **E**) has also been examined, and these are also *G. amarella*. We conclude that the Colonsay '*G. uliginosa*' plants are depauperate and simply part of the variation in *G. amarella*, and do not match *G. uliginosa* plants either from South Wales or Europe. They are probably a relatively recent development from the broad *G. amarella* genetic stock (N. Pritchard, pers. comm., 2001).

We would like to thank Noel Pritchard for discussion with TR, and Gerard Oostermeijer for Data on European *G. uliginosa*.

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Gentianella populations on Colonsay. *Liz Lavery*

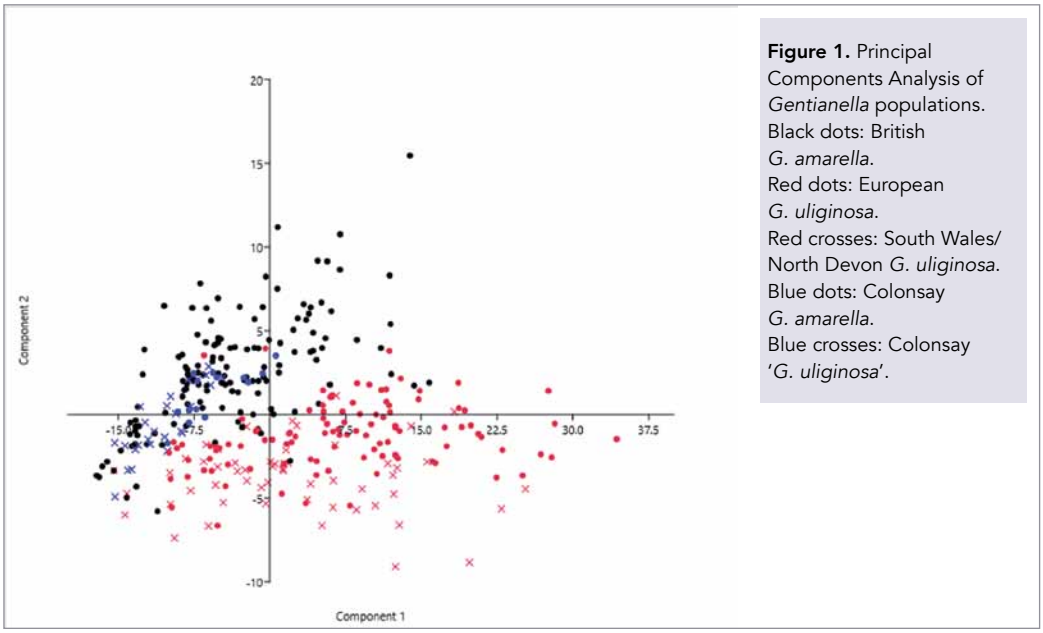

Figure 1. Principal Components Analysis of *Gentianella* populations. Black dots: British *G. amarella*. Red dots: European *G. uliginosa*. Red crosses: South Wales/ North Devon *G. uliginosa*. Blue dots: Colonsay *G. amarella*. Blue crosses: Colonsay '*G. uliginosa*'.

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A wall and its ferns

FALGUNEE SARKER

At a meeting of the Dalton Women's Institute in 2014 members decided to bring some ferns for identification and I was surprised to find a specimen of *Asplenium ceterach* (Rusty-back Fern), glistening with its golden shinny fronds. I discovered that the plant was growing in a very old, outer perimeter wall belonging to a house that was built in 1750 at Hurworth village, near Darlington. *A. ceterach* is not a common plant in County Durham (v.c.66).

The cobbled wall probably dates back to that time. Many years ago the owners were told by a local naturalist and artist, David Green, to look after this wall. With the owner's permission, I started researching into this wall's habitat. The wall was constructed using the cobbles from the River Tees that flows close to the house. *Asplenium ceterach* had been there from as far back as the owner could remember.

The wall was 37.79m long and 2.13m high and 0.42m wide. The use of lime mortar could be seen. It was a north-facing wall, but the opposite side of wall had no plant growth at all. There were many young plants of *Asplenium ceterach*, as well as established colonies. The colonies occupied a wall area 21.94m long and 2.13m high. Ninety-three plants were counted on 8th May 2014. Eighty-five was the total count of *A. ceterach* on 24th January 2015. There were 64 healthy plants and 21 dry, decayed plants, with no green leaves. This is an evergreen fern. The average length of the fronds was 17cm, with a width of 3cm. The margin of the lobe was sub-crenate for this population and the stipe was green. The frond lobes were olive green in colour and were alternately divided. The underside of the frond was densely covered with soft golden scales. Deep brown sori were linear, but they were well embedded under golden scales. Short rhizomes hidden inside the cobbles gave rise to many fronds.

I discovered a large family of spiders with an extensive network of webs present between and within the plants. It was interesting to observe that the association was predominantly between spiders and *Asplenium ceterach*. The horizontal webs were less damaged by the wind and consequently the spiders were catching more insects, the fronds enhancing the process by providing more surface area. The plants also provided shelter and hunting opportunities for the spiders and other insects. The *A. ceterach* occasionally died, but under the canopy of spiders' webs were new *A. ceterach* emerging from rock crevices, showing their ability to recover from a desiccating situation.

Other plants growing in the wall were *Taraxacum* (dandelions), *Galium aparine* (Cleavers), *Sonchus arvensis* (Perennial Sow-thistle), *Mycelis muralis* (Wall Lettuce) and *Holcus lanatus* (Yorkshire-Fog). There were shrubs growing in front of the wall: *Lonicera periclymenum* (Honeysuckle), *Rosa canina (*Dog-rose) and *Hedera helix* ssp. *helix* (Ivy).

Acknowledgements

My sincere thanks go to Mrs. Phyllis Garrod for checking the draft. I would also like to thank Mrs. Pauline Bailey, owner of the wall, for allowing me to carry out the research.

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Asplenium ceterach on the wall. *Falgunee Sarker*

Wildflower meadow woes

MICHAEL BRAITHWAITE

For 30 years my wife and I enjoyed our tiny wildflower meadow here at Clarilaw. It had had a pony in it before we came and it came up with almost pure *Ranunculus* (buttercups) in the first year. We took 'hay' from it and in just a year or two the common grasses and herbs of our neutral soils on the Silurian came back. We were able to take a proper hay crop off it once a year. We planted a few shrubs, including *Corylus avellana* (Hazel) and *Prunus padus* (Bird Cherry), to create a series of interlocking glades and added a few herbs: *Primula veris* (Cowslip), *Geranium sylvaticum* (Wood Crane's-bill) and *Leucanthemum vulgare* (Oxeye Daisy), all of which have prospered in suitable microhabitats. It was not treated with dung or other fertilisers on the assumption that lower fertility would increase floral diversity. It worked.

A recent tipping point?

Within the last two years a tipping point has been reached and it seems that the fertility has fallen further than we had envisaged to be possible. After a long, cold winter we had a dry May and the vegetation was held back. These factors alone could not explain the change that has overtaken the meadow. It has become dominated by *Anthoxanthum odoratum* (Sweet Vernal-grass) and the moss *Rhytidiadelphus squarrosus*. The moss is so extensive that the meadow looked almost bare of grasses, as the *Anthoxanthum* grows in tufts leaving gaps for the moss. The damper parts of the meadow had had plentiful *Aleopecurus pratensis* (Meadow Foxtail) which gave a lush feel to the meadow in May, and other grasses followed in June, especially *Festuca rubra* (Red Fescue), with plentiful *Alchemilla xanthochlora* (Intermediate Lady's-Mantle). These are the species that have died back. The *Alchemilla* looks particularly sad: its leaves are pallid and it is flowering sparsely. *Holcus lanatus* (Yorkshire Fog) has become prominent in June, as it always has, but even it seems less profuse than formerly.

The sudden change after 30 years with much the same regime is so marked that I was almost inclined to think that the *R. squarrosus* had evolved into a more aggressive strain, conceivable in a moss that spreads vegetatively as the mutant could take over, but this is unlikely. Watson (1968) writes about *R. squarrosus* forming unbroken sheets on the fairways of golf courses. Rodwell (1992) is unhelpful.

Sullivan *et al.* (2018) record some decline in fertility and species-diversity in a repeat survey of meadows managed for wildlife conservation over 25 years, but the decline was modest. *Alchemilla* (as *A. glabra*) was one of the species in retreat, as were the grasses *Aleopecurus pratensis, Poa pratensis* (Smooth Meadow-grass) and *P. trivialis* (Rough Meadow-grass), along with *Luzula campestris* (Field Wood-rush). These examples match the species in decline at Clarilaw, but the increasing species do not match. *Anthoxanthum odoratum* is absent from the species list recorded by Sullivan *et al.*, while mosses are not referred to.

The experience at Clarilaw suggests that the long-term effect of hay removal, combined with an absence of grazing and fertiliser application, may lead to unexpected woes and become more of a problem than the experience of Sullivan *et al.* indicates.

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INTRODUCING MY VICE COUNTY

South Northumberland v.c.67
Recorders: Quentin Groom & John Richards

JOHN RICHARDS

More than half of South Northumberland is upland in character, unintensively farmed or afforested, and bordering Scotland to the west and north. Botanical interest in the lowlands is concentrated on the wooded river valleys, whinstone outcrops and the mostly sandy coastline. Much of the county is very thinly populated except for the south-east corner, which includes part of the Tyneside conurbation.

Until the last decades of the 20th century, when George Swan published his *Flora of Northumberland* (1992), Northumberland plants and their communities were relatively little known outside the area. Two distinctive plant communities – whin grasslands, and calaminarian gravels and grasslands, largely confined to v.c.67 and with distinguished assemblages of scarce plants – have been overlooked, for instance by John Rodwell's *National Vegetation Classification* (1991–2000), and Michael Proctor's *Vegetation of Britain and Ireland* (2013).

Coast and valleys

Starting at the coast, the richest area of sand-dune grassland is found at East Chevington, south of Druridge Country Park and east of Red Row. This community is characterised by abundant *Geranium sanguineum* (Bloody Cranesbill), the county flower, *Thalictrum minus* (Lesser Meadow-rue) and *Rosa pimpinellifolia* (Burnet Rose). *Astragalus danicus* (Purple Milk-vetch) also occurs but is more local and is decreasing. Orchids include *Platanthera bifolia* (Lesser Butterfly-orchid) and *Epipactis palustris* (Marsh Helleborine). A local speciality is *Gentianella amarella* ssp. *septentrionalis* (Northern Felwort), while *Viola canina* (Heath Dog-violet) and *Vicia lathyroides* (Spring Vetch) are of local interest. At Chibburn Mouth, *Atriplex longipes* (Long-stalked Orache) and its hybrids persist. This part of the coast can sometimes boast all of our annual oraches.

The Roman Wall at Housesteads. *John Richards*

Rivers have often cut steep defiles through the local sandstones, allowing the persistence of semi-natural forest, known locally as 'denes'. A rather rich ground flora is characterised by *Stellaria nemorum* (Wood Stitchwort), *Cardamine amara* (Large Bittercress), *Lathraea squamaria* (Toothwort) and, locally, *Circaea* x *intermedia* (Intermediate Enchanter's Nightshade) and *Gagea lutea* (Yellow Star-of-Bethlehem). Well-known sites include Cupola and Briarwood Banks, on the River West

Astragalus danicus (Purple Milk-vetch). *John Richards*

Ribes spicatum (Downy Currant) *John Richards*

Allen; Whittle Dene, north of Prudhoe; and Howford Banks, west of Acomb and just north of the Tyne Watersmeet. Here and elsewhere, the North Tyne develops characteristic riverine woodlands, with *Trollius europaeus* (Globeflower), *Narcissus pseudonarcissus* (Daffodil), *Scirpus sylvaticus* (Wood Club-rush), *Campanula latifolia* (Giant Bellflower), and the local speciality *Ribes spicatum* (Downy Currant). There is a single station for *Hierachloe odorata* (Holy Grass) on private land. Away from the flood zone, a thermophilic community colonises the banks with *Campanula glomerata* (Clustered Bellflower), *Origanum vulgare* (Marjoram) and *Clinopodium vulgare* (Wild Basil). Perhaps the best dene walk starts in Bellingham and follows the Hareshaw Dene to Hareshaw Linn waterfall. *Paris quadrifolia* (Herb Paris) and *Chrysosplenium alternifolium* (Alternate-leaved Golden-saxifrage) occur early on, while *Festuca altissima* (Wood Fescue) becomes locally abundant at the top end. The latter, a local speciality of vertical dene sides, is best sought in winter as it is fully evergreen. At the waterfall itself is a large population of the very rare *Asplenium trichomanes* ssp. *pachyrachis* (Maidenhair Spleenwort), while *Trichomanes speciosum* (Killarney Fern) gametophytes occur along the path.

The South Tyne drainage, emptying the Pennine ore-fields, has developed distinctive flood deposits rich in the toxic cations lead, zinc and cadmium. These 'calaminarian grasslands' occur right down to the tidal zone at Newburn, carrying a distinctive plant community characterised by *Noccaea caerulescens* (Alpine Penny-cress), *Minuartia verna* (Spring Sandwort), *Armeria maritima* (Thrift), *Viola lutea* (Mountain Pansy), *Cochlearia pyrenaica* (Pyrenaean Scurvygrass) and a local calaminarian ecotype of *Silene vulgaris* (Bladder Campion). Where *Betula pendula* (Silver Birch) colonises these areas, *Epipactis dunensis* (Dune Helleborine) is frequently found, even at Newburn. In several sites along the Tyne, *E. dunensis* has found urban sites also to its taste, colonising an industrial complex, a mine ground-water amelioration scheme, and even a hospital car park! However, it is best seen, together with the other metallophytes, at the Williamston Reserve, just south of Slaggyford, where many hundreds occur annually. The South Tyne boasts a number of other such calaminarian beaches.

The Whin Sill (a dolerite) represents an igneous intrusion into the Carboniferous sedimentary rocks which crops out as a narrow interrupted band right across the county from the far south-west at Walltown as far as Lindisfarne (in v.c.68). Much has been quarried for roadstone. In places, as at Walltown, it forms flat plates on which very thin soils develop. Here, huge populations of *Allium schoenoprasum* (Chives) thrive in the company of an interesting assemblage of annuals, of which *Scleranthus annuus* (Annual Knawel) and *Geranium columbinum* (Long-stalked Crane's-bill) are perhaps the most notable. In parts, the whinstone ridge

Carpets of *Allium schoenoprasum* (Chives) at Walltown. *John Richards*

hosts the Roman Wall. Hereabouts, for instance east of the Cawfield or Steel Rigg car parks, the boulder scree below the north-facing cliffs hosts a rich pteridophyte flora, with prominent *Huperzia selago* (Fir Clubmoss), *Cryptogramma crispa* (Parsley Fern) and *Dryopteris oreades* (Mountain Male-fern). Further east, drier, more insolated whin crags, for instance at Colwell, just east of the A68, carry large populations of *Dianthus deltoides* (Maiden Pink), *Saxifraga granulata* (Meadow Saxifrage), *Allium vineale* (Crow Garlic) and a rich annual assemblage.

Steel Rigg is also the best access for Crag Lough, botanically the richest of the Northumbrian Loughs which characterise the Roman Wall district. Substantial, and at times rather unsafe, marginal fens contain several unusual sedges, including

Broomlee Lough. *John Richards*

Carex lasiocarpa (Slender Sedge) and *C. diandra* (Lesser Tussock-sedge). Several of the loughs have interesting pondweeds, with *Potamogeton praelongus* (Long-stalked Pondweed) at Crag and Haileypike Loughs and *P. lucens* (Shining Pondweed) in Broomlee Lough. Both Broomlee and Greenlee Loughs have a local abundance of *Persicaria minor* (Small Water-pepper).

Uplands and mires

Much of the wetter and colder upland parts of the county give rise to soils with an acidic reaction such as rankers, podsols and blanket peat. Frequently these overlie limestones or calcareous sandstones, so it can be surprising to find that spring-fed mires are base-rich, even tufaceous on occasion. Such habitats are widespread and carry a characteristic flora in which the sedges *Carex lepidocarpa* (Long-stalked Yellow-sedge), *C. hostiana* (Tawny Sedge), *C. dioica* (Dioecious Sedge), *C. pulicaris* (Flea Sedge), *Eleocharis quinqueflora* (Few-flowered Spike-rush), *Eriophorum latifolium* (Broad-leaved Cottongrass), *Trichophorum cespitosum* s.s. (Northern Deergrass), *Pinguicula vulgaris* (Common Butterwort), *Parnassia palustris* (Grass-of-Parnassus) and *Dactylorhiza incarnata* (Early Marsh-orchid) are prominent. Many such sites are not easily accessed, but good examples can be found beside the Pennine Way on Whitley Pike (Blackheugh End), about five miles north of Bellingham.

Even more difficult to access are some of the best examples of raised mires in the country. In fact, raised mires proliferate, particularly in the Roman Wall country, but many are now in a less-than-ideal condition. Nevertheless, most still carry *Andromeda polifolia* (Bog Rosemary). The very best mires boast *Drosera anglica* (Great Sundew), *Rhynchospora alba* (White Beak-sedge), *Carex magellanica* (Tall Bog-sedge), *C. pauciflora* (Few-flowered Sedge) and a suite of rare *Sphagna*. Most are buried deep in the huge Wark or Kielder Forests, reachable only by using gated forest roads. Bellcrag Flow, an excellent example, is, however, not far from the Pennine Way in the Wark Forest. Neither of our sites for *Betula nana* (Dwarf Birch) are easily accessed.

Despite the upland character of much of the county, truly alpine communities are mostly absent. However, if you follow the Carrier's Way south-westwards from Dirt Pot (Allenheads) towards the

Above *Diphasiastrum* x *issleri* (Issler's Clubmoss) and *D. alpinum* (Alpine Clubmoss).
Left *Eleocharis mamillata* (Northern Spike-rush) at Bakethin Reservoir. *John Richards*

Cumbrian border, you reach an area with no less than four clubmosses: *Huperzia selago*, *Lycopodium clavatum* (Stagshorn Clubmoss), *Diphasiastrum alpinum* (Alpine Clubmoss) and *D.* x *issleri* (Issler's Clubmoss). The last-named, rather enigmatic plant occurs in at least two other sites in the county. Its true identity is yet to be revealed, but it is distinctive enough when seen. Also on this walk or nearby are locations for *Saxifraga stellaris* (Starry Saxifrage), *Epilobium alsinifolium* (Chickweed Willowherb) and *Myosotis stolonifera* (Pale Forget-me-not) and its hybrid *M. x bollandica*.

County specialities

It is perhaps a characteristic of the county that some of the major rarities are difficult to both find and/or identify. The only plant currently confined to our county in the British Isles is the lady's-mantle *Alchemilla micans* (*gracilis*) (Shining Lady's-mantle). This is at best very difficult to find at two of its three stations. At the third, a transplant site, it occurs in great numbers, but within a working quarry where a visit requires special permission.

Another county 'special' is *Eleocharis mamillata* (Northern Spike-rush). This still occurs in the shallows of the nether reaches of the River Irthing, and Bakethin Reservoir, Kielder, but has become very shy-flowering, and, worse, in recent years seems not to set seed. Another plant which seems to be racing to UK extinction while under our watch is *Crepis mollis* (Soft Hawk's-beard). We may now have at least half the British sites, concentrated in the Allendale area, but numbers are dropping fast as the sites become increasingly overgrown. This spectre of eutrophication owing to NO_x gas deposition has affected many of our rarer species, so that *Antennaria dioica* (Mountain Everlasting) has recently become extinct in the county and *Gentianella campestris* (Field Gentian), *Sedum villosum* (Hairy Stonecrop) and *Myosotis stolonifera* have also nearly disappeared.

To find out more about the plants of South Northumberland, visit the website 'Flora North-east' at www.botanicalkeys.co.uk. Here you will find distribution maps at tetrad resolution, a Rare Plant Register, a Newsletter, which is published twice a year, and customised recording cards (Latin or English). We welcome records, which should be sent to QGroom@botanicalkeys.co.uk. The Natural History Society of Northumbria holds a number of Botanical field meetings and lectures every year.

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BEGINNER'S CORNER

Tips on ticks

HAZEL METHERELL

My husband joyfully announced he had got a tick. It turned out he had seen a plant species for the first time, and could tick it off his lifetime list!

I don't want to scare anyone. I have had no tick bites in the last ten years, but I know it is more common in some localities and forewarned is forearmed!

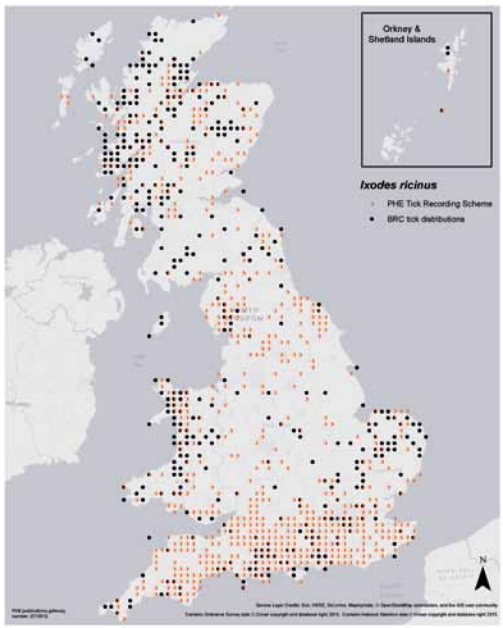
There are 21 native species of tick in Britain, most of which feed on birds. They are blood-sucking parasites of the class Arachinda. The most likely to be encountered that feeds on people is *Ixodes ricinus*, a member of the Ixodidae family. This is a generalist which feeds on three different types of host species. It attacks sheep, pets and birds, but its distribution is most closely linked with deer populations and other host species, such as Pheasants and small mammals (Medlock *et al.*, 2009).

With deer populations rising nationally, there has been an increase in ticks. Ticks are widespread geographically, but are more common in southern and western Britain and the Highlands of Scotland, as shown on the map opposite. They need a suitably moist microclimate in order to complete all their life stages and are therefore mostly found in woodland, long grass and, particularly, stands of Bracken. The main period when the nymphs, larvae and adults are active is between March and October, with peaks in summer and early autumn.

They live most of their lives in damp vegetation, not moving far from where they have dropped off a previous host, often months before. When hungry they will climb plant stalks to detect the warmth, carbon dioxide and vibrations from potential hosts – an activity known as 'questing'. As the host passes by the tick may be brushed onto them; they do not leap or fly. Once on board they walk over the skin to damp areas such as the armpits, groin, hairline, waist and behind the knees. They insert their barbed mouthparts and take a long blood drink. When sated, they drop off again. This is distasteful but not dangerous, except that a small proportion of ticks are a vector for Lyme disease.

Lyme disease is a bacterial infection – *Borrelia burgdorferi s.l.* (Medlock *et al.*, 2009). The symptoms may be a flu-like fatigue, with muscle and joint pain, or a slowly expanding area of red rash around the bite site, or both. These may take up to three months to develop. If it is noticed soon enough, it can be cured with a course of antibiotics. If you develop these symptoms, it is advisable to go to your GP, even if you were not aware of having been bitten, but tell the doctor that it is a possibility. Untreated cases can develop more serious and permanent effects.

In upland areas, ticks are also a vector for louping ill virus (LIV), a pathogen that affects Red Grouse, Mountain Hares and livestock.



Distribution of *Ixodes ricinus*. Public Health England

Sizes compared to a one penny coin.

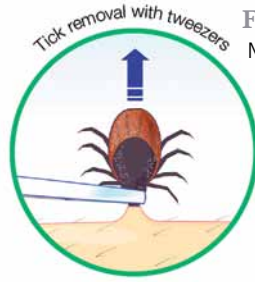
Above A 'questing' female *Ixodes ricinus* in woodland. *Jolyon Medlock*

Left Life cycle of *Ixodes ricinus*. From base upwards: larva, nymph, female, male.

Taking sensible precautions

Botanists like to range in the countryside and may even linger in damp vegetation, lowering themselves for a better view of interesting plant specimens. This puts them at a higher risk than the general population. What can you do to prevent being bitten?

Local botanists will often let you know if an area is of higher risk, or you could ask around the local dog walkers. The common advice of sticking to the middle of established paths and avoid brushing against plants is hardly helpful to botanists! You can wear wellies, long sleeved tops, or tuck your trousers into your socks to reduce ankle level entry. Shorts and sandals are clearly not advised. Insect repellents, such as DEET, either as a spray or a cream, can reduce tick contact. Some people wear pale trousers to more easily show up any hitch-hikers. The ticks can be anything from smaller than an 'o' on this page, to pea-sized, with thread-like legs wavering around the body. They can be flicked off clothing if spotted, but if they have started to burrow into skin they must be removed using fine-tipped tweezers or a wire tick-removing tool. Care should be taken to remove the animal without squeezing its body as this releases juices into the host. Grip as close to the skin as possible and lift from beneath. Tick-removing tools are available inexpensively from pet shops. It is best to then wipe the area with an antiseptic wipe. It is advised to check your skin, particularly in the damp areas, after each expedition.



Further advice

More information is available from www.nhs.uk/conditions/lyme-disease or www.gov.uk/guidance/tick-surveillance-scheme, which also details ways to send in ticks, together with information to improve our knowledge of their distribution and activity.

Bearing these things in mind, botany is a safer activity than most, and the countryside is still a wonderful place to enjoy.

References

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IDENTIFICATION

Terminology and identification in the annual native *Atriplex* species of the British Isles: Part II Identification and key

BOB LEANEY

Atriplex x *taschereaui* hybrid derivative. Note the short triangular leaves and very large, leaf-like, non-spongy bracteoles, elongate spines and pseudostalks. Tongue, Sutherland, Scotland. 2nd September 1975. Taschereau MANCH collection, 1978.

In the first article of this series, to be published in the *Journal of British and Irish Botany*, I have dealt with the descriptive terminology used in the identification of the annual native *Atriplex* (oraches), and described findings from a ten-year study based on Norfolk plants and an analysis of the Taschereau MANCH collection of *Atriplex longipes* and its hybrids. Here, I present a key derived from these findings, together with illustrations.

Characters and terminology

The main findings of my study, for the purposes of the key, can be summarised as follows.

Leaf basal angle: I found, as did Taschereau, that mid-stem as well as lower-stem leaves could be used for this character. Those with the maximum basal angle are the diagnostic ones: maximum angle 180° – 220° (truncate – subcordate) in *A. prostata* and *A. glabriuscula*; c. 180° (truncate) in *A.* x *gustafssoniana* and *A.* x *taschereaui*; c. 160° in *A. longipes s.s.* and *A. patula*.

Basal leaves: in *A. patula* these can all be simple, with no basal lobes; these plants will tend to key out in standard keys to *A. littoralis*.

Exaggeratedly long basal lobes are frequent in *A. longipes s.s.* and *A.* x *gustafssoniana*.

Elongate triangular (or trullate) leaves, where the central segment of the lower- or mid-stem leaves (minus basal lobes) has a length to breadth ratio of >2.5, are characteristic of *A. longipes. s.s.* and *A.* x *gustafssoniana*, but very infrequent in *A. prostata*.

Leaf succulence is especially characteristic of *A. longipes s.s.*, but can also be found in *A.* x *gustafssoniana*. and *A. glabriuscula*.

Yellow leaf colour at maturity is a good field character for *A. longipes s.s.* and *A.* x *gustafssoniana*. *A. prostata* in saline conditions normally turns a deep purplish red, never yellow.

Bracteole lengths, much used in standard keys, were found to be enormously variable and of little use in identification.

Bracteole basal angle (the angle subtended by the lower edges of the lateral laminae) should be used rather than 'proportion fused', as it is much more constant in any one taxon: 130°–180°in *A. prostata*; 80°–110° in *A. glabriuscula* and *A. patula*; in between in the other taxa. The point of fusion is always at the widest point of the bracteole pair, between the lateral angles if present, and the basal segment of the bracteole pair below this point is pretty constant in shape and length. On the other hand, the length of the distal segment varies enormously with the length of the foliose portion. Forms of *A. patula* are frequent where the bracteoles have very long or even leaf-like foliose portions and these will key out wrongly in standard keys, because the proportion fused will be well below one-third.

Bracteole basal thickening can be either incompressible (woody or cartilaginous) or compressible (spongy), and should be looked for by examining the bracteole pair from the side.

Foliose portion: the shape of the flap-like portion of the bracteole pair, above the fruit compartment, can be very useful: very short in *A. glabriuscula*, but long in *A.* x *taschereaui*; tending to narrow and tongue-shaped in *A. littoralis*; showing a definitely convex edge in *A. prostata*, but a more or less straight edge in *A. patula* and *A. longipes s.s.*; sometimes with a concave edge and drawn-out acuminate tip in *A.* x *gustafssoniana*.

Serration: most taxa can have an entire or serrate edge to the foliose portion, but in *A. longipes s.s.* the edge is always entire or subentire.

Spininess: again most taxa can have either smooth or spinous bracteoles, but in *A. longipes s.s.* there are never any true spines, although the bracteole surface may be bumpy (muricate).

Elongate spines: Very large axillary bracteoles (<40mm) in *A.* x *taschereaui* often bear elongate spines with a l:b ratio of 3–6. These are diagnostic.

Prominent and reticulate venation were said by Taschereau to be characteristic of all the *A. longipes* complex. I confirmed this, but only in dried specimens. In *A.* x *taschereaui* there is often a particularly broad mid-vein with a fusiform swelling at its base from which prominent veins arch upwards connected by cross veins (reticulate venation).

Pseudostalks may occur in *A.* x *taschereaui*, where the broad and prominent mid-vein may extend up to 10mm or so downwards as a stalk-like protrusion with a very narrow and gradually attenuating wing of bracteole tissue on each side. This is again diagnostic, if present.

Bracteole stalking hardly occurs on inflorescence branch bracteoles, usually only on axillary bracteoles, and is *not* confined to the *A. longipes* complex, being found occasionally in *A. patula* (<5mm), and *A. laciniata* (<19mm). The use of bracteole stalk length to separate *A.* x *gustafssoniana* (<5mm) from *A. longipes s.s.* (>5mm) was broadly confirmed by my study. However, my findings suggested that plants with bracteole stalks only a little over 5mm long, but with spines, serrations, and concave-edged foliose portions, should be assigned to *A.* x *gustafssoniana*.

Seed radical direction and point of origin are of crucial importance in separating *A. prostata* from *A. glabriuscula*. There is no constant difference in leaf shape between these two taxa, and *A. prostata* growing on or near a beach can have succulent greyish leaves with much mealiness. Such plants can also have tiny, almost spherical, bracteoles, with very short foliose portions, inviting confusion with *A. glabriuscula* unless the seed radicle is checked.

Hybrid derivatives in the *Atriplex longipes* complex not dealt with in standard keys

My study of the Taschereau MANCH collection showed that around a third of the specimens of the two hybrid taxa within the *A. longipes* complex had all sessile bracteoles. This was sometimes remarked on by Taschereau on the sheets, but these forms (probably segregates rather than introgressives) were not allowed for in his key (Taschereau, 1985). Forms of *A.* x *taschereaui* with very large leaf-like axillary bracteoles lacking basal thickening were also found. These hybrid derivatives of *A.* x *gustafssoniana* or *A.* x *taschereaui* would key out wrongly in keys derived from Taschereau, either as *A. prostata* or *A. glabriuscula*.

Partially diagnostic characters

Because of extreme variability, my study of the Taschereau collection did not find any *absolutely diagnostic* characters to define *A.* x *gustafssoniana*

Atriplex longipes s.s. Note the elongate trullate leaves and non-spiny, entire edged bracteoles, with very long stalks. Penpoll, Cornwall. Taschereau MANCH collection, 1978.

or *A.* x *taschereaui* – in other words, there were no characters that occurred only in the one taxon and occurred in all examples of that taxon. There were, however, a good number of *partially diagnostic* characters that did not occur in all examples but which could be used to define a taxon if used in *diagnostic character combinations*. Partially diagnostic characters can be of two types: first, those that, *when they do occur*, are truly diagnostic as they never occur in other taxa; and secondly, characters that are particularly frequent in the taxon concerned, or occur to an extreme degree, but are very infrequent or little developed in other taxa.

Illustrations

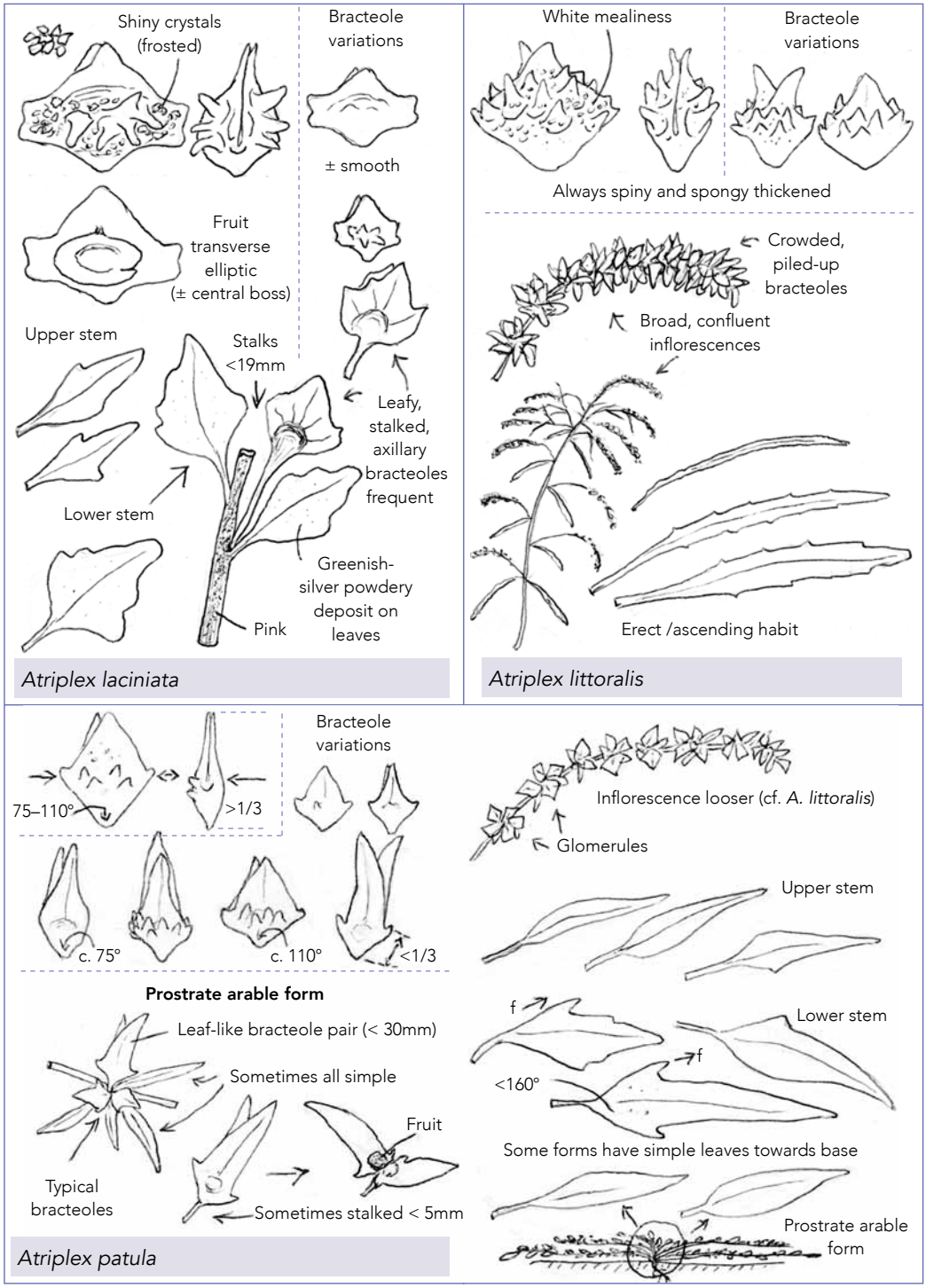
With the exception of those for *Atriplex praecox*, which are redrawn from Taschereau (1985), the drawings are all of Norfolk specimens or selected from the Taschereau MANCH collection of *A. longipes* and its hybrids. For anybody with a special interest in the *A. longipes* complex, I can supply a full set of drawings from the collection.

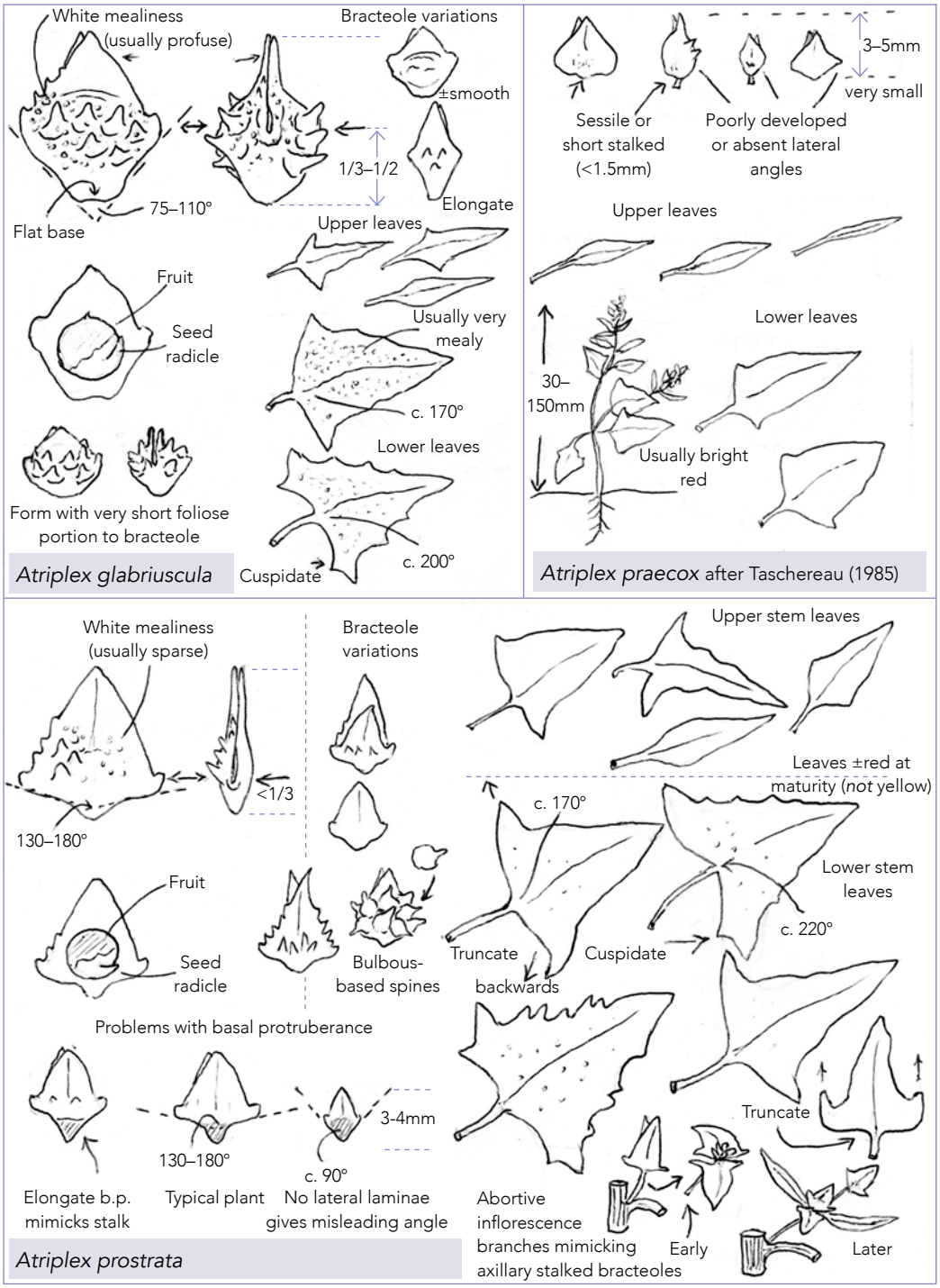
Atriplex x *gustafssoniana* hybrid derivative close to *A. longipes s.s.* Note the elongate triangular-trullate leaves with exaggeratedly long basal lobes. Looe, Cornwall, 1978?. Taschereau MANCH collection, 1978.

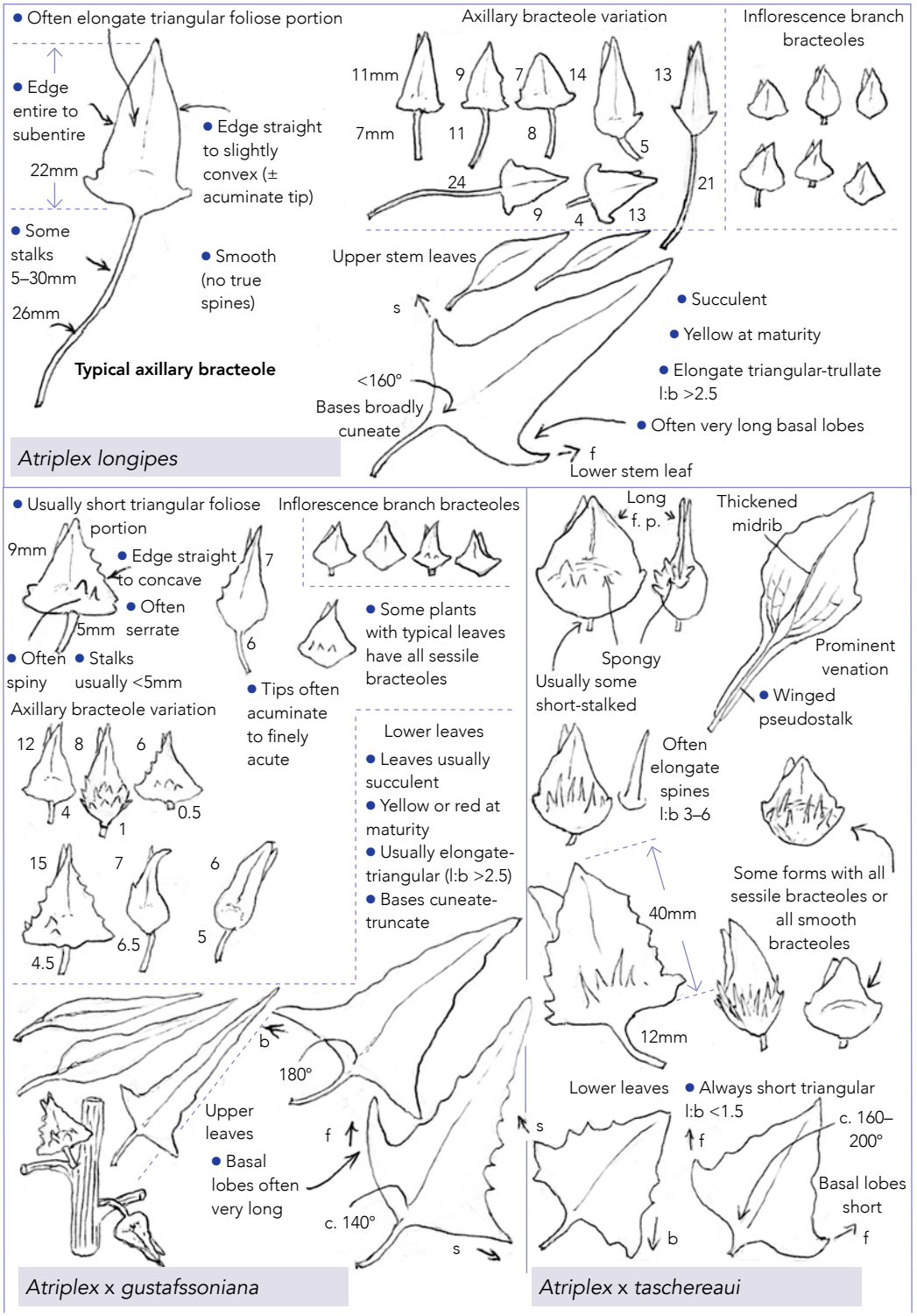
The key

The perennial and alien species of *Atriplex* should immediately be recognised as 'something different', and are dealt with in the first half of Stace's key (Stace, 2010). The key and illustrations given here deal only with the annual native oraches normally encountered, and are designed to supplement the second half of Stace's key. They allow for identification of simple-leaved forms of *A. patula*, sessile-bracteoled, hybrid derivatives in the *A. longipes* complex, and hybrid derivatives of *A.* x *taschereaui* with non-spongy bracteoles.

The key and drawings should help botanists to use bracteole characters in the field to better separate the commoner species (especially *A. prostata*/*A. patula* and *A. prostata*/*A. glabriuscula*). They should also encourage recognition of the *A. longipes* complex; in saline conditions near estuaries or beaches always remember to look for axillary bracteoles, and late in the season (Oct.–Nov.) keep an eye out for plants turning yellow.


Shiny crystals (frosted)
Bracteole variations
± smooth
Fruit transverse elliptic (± central boss)
Upper stem
Stalks <19mm
Leafy, stalked, axillary bracteoles frequent
Lower stem
Greenish-silver powdery deposit on leaves
Pink
Atriplex laciniata
White mealiness
Bracteole variations
Always spiny and spongy thickened
Crowded, piled-up bracteoles
Broad, confluent inflorescences
Erect /ascending habit
Atriplex littoralis
75–110°
>1/3
Bracteole variations
c. 75°
c. 110°
<1/3
Prostrate arable form
Leaf-like bracteole pair (< 30mm)
Sometimes all simple
Fruit
Typical bracteoles
Sometimes stalked < 5mm
Atriplex patula
Inflorescence looser (cf. A. littoralis)
Glomerules
Upper stem
f
Lower stem
f
<160°
Some forms have simple leaves towards base
Prostrate arable form


White mealiness (usually profuse)
Bracteole variations
±smooth
1/3–1/2
Elongate
75–110°
Flat base
Upper leaves
Fruit
Seed radicle
Usually very mealy
c. 170°
Lower leaves
Form with very short foliose portion to bracteole
Cuspidate
c. 200°
Atriplex glabriuscula
3–5mm
very small
Sessile or short stalked (<1.5mm)
Poorly developed or absent lateral angles
Upper leaves
Lower leaves
30–150mm
Usually bright red
Atriplex praecox after Taschereau (1985)
White mealiness (usually sparse)
Bracteole variations
<1/3
130–180°
Fruit
Seed radicle
Bulbous-based spines
Problems with basal protruberance
130–180°
3-4mm
c. 90°
Elongate b.p. mimicks stalk
Typical plant
No lateral laminae gives misleading angle
Atriplex prostrata
Upper stem leaves
Leaves ±red at maturity (*not* yellow)
c. 170°
Lower stem leaves
c. 220°
Truncate backwards
Cuspidate
Truncate
Abortive inflorescence branches mimicking axillary stalked bracteoles
Early
Later


Often elongate triangular foliose portion
Edge entire to subentire
22mm
Edge straight to slightly convex (± acuminate tip)
Some stalks 5–30mm
26mm
Smooth (no true spines)
Typical axillary bracteole
Axillary bracteole variation
11mm
9
7
14
13
7mm
11
8
5
24
21
9
4
13
Inflorescence branch bracteoles
Upper stem leaves
s
Succulent
Yellow at maturity
Elongate triangular-trullate l:b >2.5
<160°
Bases broadly cuneate
Often very long basal lobes
f
Lower stem leaf
Atriplex longipes
Usually short triangular foliose portion
9mm
Edge straight to concave
Often serrate
5mm
Often spiny
Stalks usually <5mm
7
6
Tips often acuminate to finely acute
Inflorescence branch bracteoles
Some plants with typical leaves have all sessile bracteoles
Axillary bracteole variation
12
8
6
4
1
0.5
15
7
6
4.5
6.5
5
Lower leaves
Leaves usually succulent
Yellow or red at maturity
Usually elongate-triangular (l:b >2.5)
Bases cuneate-truncate
b
180°
Upper leaves
Basal lobes often very long
f
c. 140°
s
Atriplex x gustafssoniana
Long f. p.
Thickened midrib
Spongy
Usually some short-stalked
Prominent venation
Winged pseudostalk
Often elongate spines l:b 3–6
40mm
12mm
Some forms with all sessile bracteoles or all smooth bracteoles
Lower leaves
Always short triangular l:b <1.5
s
f
c. 160–200°
Basal lobes short
b
f
Atriplex x taschereaui

A key to the annual native *Atriplex* species of the British Isles

1. Leaves frosted greenish silver with Krantz venation; stems purplish pink; bracteoles broadly rhombic, usually wider than long, base broadly cuneate to truncate, **thickened at the base**, **hard and incompressible (cartilaginous or woody)**, with **prominent, squared-off lateral angles**, most with broad based spines, occasionally smooth; **fruit transversely elliptical**, often with central boss . . . . . ***A. laciniata* (Frosted Orache)**
Nearly always on sand on the lower beach, often part of the foredune community with *Cakile maritima*, *Salsola kali* and *Elytrigia juncea*, or just below it, less often on the upper beach, or on pebbles or shingle.

1. Leaves green or greyish green/mealy, not silvery, stems the same (not purple-pink); bracteoles either thickened at base but soft and compressible (spongy), or not thickened at base and leaf-like (herbaceous); fruit orbicular 2

2. Lower- and mid-stem leaves simple, without basal lobes 3

2. Lower- and mid-stem leaves with basal lobes 4

3. Always erect or ascending, with bracteoles in broad, cylindrical, and mainly confluent masses; **lower- and mid-stem leaves parallel-sided, linear or linear-oblong**, bases attenuate, edges usually dentate; **bracteoles trullate-ovate, base broadly cuneate (basal angle 105°–125°), always spongy and 'fat' from sideview and always profusely spiny**, foliose portion narrowly triangular or tongue-shaped, often recurved at maturity . . . . . ***A. littoralis* (Grass-leaved Orache)**
Obligate halophyte on upper beach, estuarine silt, or just above saltmarsh; in recent decades frequent to dominant over long stretches of salted major roads.

3. Usually prostrate or ascending, bracteoles more in groups (glomerules); lower- and **mid-stem leaves lanceolate, (*not* parallel-sided)**, bases cuneate or rounded, usually entire edged; **bracteoles trullate to rhombic (diamond-shaped)**, **base narrowly cuneate (basal angle 75°–110°)**, **never spongy and 'fat' from side view, smooth or sparsely spiny**, foliose portion broadly triangular, usually with foliose portions well applied (occasionally foliose portions elongate, leaf-like and recurved). . . . . ***A. patula* (Common Orache)** (simple-leaved form)
The most common simple-leaved form of *A. patula* is a strictly procumbent, plate-like plant on consolidated arable land, with numerous main branches radiating outwards horizontally from a main stem only 1–2cm long; this form often produces very long bracteoles (<32mm) with elongate foliose portions (proportion fused around 1/4 rather than 1/3–1/2), and occasionally with stalks up to 5cm.

4. All bracteoles sessile without true stalks or pseudostalks. 5

4. Some bracteoles (usually axillary) with either true stalks or pseudostalks 9

5. Bracteoles thickened at base, appearing 'fat' from side view (spongy). 6

5. Bracteoles *not* thickened at base, thin and leaf-like from side view apart from slight swelling of fruit compartment at base (herbaceous) 7

6. Foliose portion very short (shorter than wide), obtuse to subacute tipped; **bracteoles** fairly small (<10cm), **base narrowly cuneate (75°–110°)** , usually with flattened point of attachment; **no prominent central vein or reticulate venation, usually spiny and, if so, short spiny (l:b <3.0); seed radicle arising from lateral base and pointing upwards . . . . . *A. glabriuscula* (Babington's Orache)**
Obligate halophyte on exposed beaches of sand or shingle, on the upper beach, or just above beach; very infrequent on estuarine sites or salted road verges.

6. Foliose portion long (as long or longer than wide), obtuse to subacute tipped; **bracteoles** fairly large (<17mm), shape and basal angle very variable, seldom with flattened point of attachment; **sometimes**

with prominent central vein and reticulate venation; often smooth, but **if spiny usually some bracteoles with elongate spines (l:b 3–6); seed radicle arising from centre or near centre of base and pointing laterally or obliquely upwards** . . . . . ***A. x taschereaui* (Taschereau's Orache)** (hybrid derivative with all sessile bracteoles)

7. Lower- and mid-stem leaves lanceolate to ovate, basal lobes sideways or forwardly directed, bases narrowly cuneate (basal angle <160°); bracteoles trullate to rhombic (diamond-shaped); bases narrowly cuneate (basal angle 75°–110°), smooth or sparsely spiny, **foliose portion triangular with straight, subentire edge** . . . . . ***A. patula***
Wasteground, road verges and especially arable habitats; infrequent on salted road verges; only rarely on or near beaches, or in estuarine habitats.

7. Lower- and mid-stem leaves variously shaped, often with some basal lobes backwardly directed, basal angle variable (often some 160°–220°); bracteoles not diamond-shaped but triangular, triangular-ovate, trullate or trullate-ovate **8**

8. Lower- and mid-stem leaves yellow or red at maturity, mainly elongate triangular (l:b >2.5), with more or less truncate, but not subcordate, bases, basal lobes often very long, pointing forwards, sideways or backwards; **bracteoles often short spiny**, triangular to triangular-trullate, **foliose portion short triangular, some with concave edges and finely acute, long acuminate tips**, often serrate edged . . . . . ***A. x gustafssoniana* (Kattegat Orache)** (hybrid derivatives with all sessile bracteoles)

8. Lower- and mid-stem leaves sometimes red at maturity (*not* yellow), short triangular or triangular-ovate (l:b <1.5), with short basal lobes usually pointing sideways or backwards, **some with truncate to subcordate bases (basal angle 160°–220°)**, basal lobes always short; **bracteoles**, triangular to triangular-ovate, **foliose portion broadly triangular, all with markedly convex edges and obtuse to subacute tips**, usually serrate edged and with short spines (l:b <3) . . . . . ***A. prostrata* (Spear-leaved Orache)**
Most widespread taxon on inland ruderal habitats, industrial wasteground and road verges, occurring frequently in salted main roads along with *A. littoralis*; less common than *A. patula* on arable land, but much more common on beaches and estuarine habitats, including the edge of *Phragmites* stands.

9. Very small plants (3–15cm), usually red when mature; lower- and mid-stem leaves all very small, ovate to lanceolate **with short**, **outward pointing basal lobes; bracteoles very small (3–5mm), rhombic ovate or triangular ovate, sessile or with very short stalks (0.5–1.5mm), poorly developed or absent lateral angles, very thin herbaceous or membranous . . . . . *A. praecox* (Early Orache)**
Northumberland and west coast of Scotland, including Shetland; recently discovered in north Wales and Ireland (Rees 2018; Green 2018). On lower beach just above *Fucus* zone, mainly on shingle in sheltered inlets of sea, or on sea lochs.

9. Usually large plants (10–90cm), staying green or going yellow or reddish when mature; lower- and mid-stem leaves large, **with well-developed basal lobes** pointing forwards, sideways or backwards; **bracteoles small to very large (4–40mm), with short to very long stalks (0.5–30mm), most with well-developed lateral angles, thickly herbaceous, succulent or spongy in texture** **10**

10. Bracteoles not thickened and spongy at base (herbaceous) **11**

10. Bracteoles thickened and spongy at base **12**

11. Tall, sometimes erect, plant (20–90cm), **turning yellow at maturity; lower- and mid-stem leaves succulent, some elongate triangular-trullate (l:b >2.5), bases cuneate with well-developed or very long basal lobes pointing sideways or forwards; some axillary bracteoles large or very large (9–25mm), with long or very long stalks (5–25(–30)mm)**; bracteoles always smooth or muricate **(no real**

spines), foliose portion triangular or elongate triangular, with straight to slightly convex and entire or subentire edge . . . . . ***A. longipes s.s.*** **(Long-stalked Orache)**
Obligate halophyte; usually estuarine and on silt, either at the high-tide level of the proper river edge, in saltmarsh or in *Phragmites* stands just above the river edge; less often just above coastal saltmarsh; associated with *Phragmites*, *Elytrigia atherica* and, according to Taschereau, *Juncus maritimus* and *Aster trifolium;* in North Wales associated also with *Bolboschoenus maritimus* (Rees 2017).

11. Tall, sometimes erect, **yellow** or red **at maturity; lower- and mid-stem leaves succulent, triangular or elongate-triangular (l:b >2.5), bases cuneate to truncate, (basal angle <180°) with often extremely long basal lobes sometimes pointing backwards as well as sideways or forwards; axillary bracteoles short (3.5–10mm) with short stalks (usually <5mm), frequently short spiny (l:b <3), foliose portions short triangular, many with concave edges, and often with long acuminate tips, frequently serrate** . . . . . ***A. x gustafssoniana***
Hybrid derivatives of *A.* x *taschereaui* with non-spongy bracteoles will key out here: in these forms bracteoles often very large (<40mm); foliose portions all convex edged; usually with either prominent venation, pseudostalking or elongate spines.
Usually on silt, just above saltmarsh, on brackish river banks, or in the edge of estuarine *Phragmites* beds; most commonly associated with *Phragmites*, *Puccinellia maritima*, *Elytrigia atherica*, or (according to Taschereau) *Juncus maritimus*.

12. Short, usually prostrate or ascending, plant; **lower- and mid-stem leaves short triangular to triangular-ovate (l:b <1.5), bases broadly cuneate to truncate, basal lobes always short, pointing forwards, sideways or backwards; axillary bracteoles frequently very large (10-20(-40)mm), true stalks short to quite long (0.5–11mm)**, shape extremely variable even on the same plant (triangular, trullate, rhombic or ovate), **foliose portion longer than wide; large bracteoles often have prominent central vein and reticulate venation sometimes with the central vein extending downwards into a winged pseudostalk**, smooth or spiny, **frequently elongate spiny (l:b >3-6); seed radicle arising from centre or near centre of base and pointing laterally or obliquely upwards** . . . . . **A. x *taschereaui***
Exposed beaches of sand or shingle, often with *A. glabriuscula*, mainly Scotland and north-west England.

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ADVENTIVES AND ALIENS NEWS 15

COMPILED BY MATTHEW BERRY

In Adventives & Aliens News 14, I gave details of a record of *Pennisetum macrourum* (Fountain Grass) for v.c.1a (W. Cornwall). There is another very similar *Pennisetum* species which might be grown in this country, namely *P. flaccidum* (Himalayan Fountain-grass). It is a native of East Asia, where it occurs on hillsides and marginal ground of various sorts. It is also highly rhizomatous, but has laxer, more flexuous panicles, with the tip sometimes curling over slightly. It is less tender than *P. macrourum* and would certainly be the patch-forming *Pennisetum* to look out for away from the south coast. There are as yet no records for it in the DDb.

Just to make life more interesting, it seems that a decision has been made on high to sink all *Pennisetum* species into the genus *Cenchrus*. From a field botanical perspective this is surprising, as the 'British' examples of the two genera show no convincing signs of close kinship, but perhaps that is just my undiscriminating eye!

An alien species which grabbed the botanical headlines a while back, so to speak, was *Bassia scoparia* (Summer-cypress), which was clearly spreading along the verges and central reservations of our trunk roads and motorways in the manner of *Dittrichia graveolens* (Stinking Fleabane). Is it still doing so, or is it in fact beginning to peter out? I only ask the question because I have not been receiving any records lately, nor have I heard reports of any new sightings, nor seen any candidates for it myself on my own, admittedly, rather limited travels around v.c.14 (E. Sussex). If anyone has made new records for it – either obviously new sites within a tetrad, or new tetrad/vice-county records – in 2017/18, please let me have the details, along with any local answers you might have to my general question. As *B. scoparia* has several look-a-likes, and if not encountered previously is, in any case, a difficult species to visualise ahead of any targeted search, I would recommend study of the images at http://alienplants.be/content/bassia-scoparia, which show both the branching at a distance and details of the leaves and flowers in close-up.

I close this section with an important nomenclatural update. In Adventives & Aliens News 8, I reported the discovery by David Trevan of *Strobilanthes atropurpurea* (Kashmir Acanthus), established in a wood on the Isle of Wight (v.c.10). The plant at this site has since been renamed. For the new name and the story of how this name change came about, members should consult Colin Pope's account on p. 98 of *Proceedings of the Isle of Wight Natural History and Archaeological Society*, vol. 30 (2016). Many thanks.

V.c.3 (S. Devon)

Mentha requienii (Corsican Mint). Plymouth Hoe (SX473542), 6/2014, R. Hodgson: established in pavement cracks.

V.c.4 (N. Devon)

Mentha requienii (Corsican Mint). Meshaw (SS7519), 6/2017, R. Hodgson: Rob describes the location as 'a remote village' and notes that the plant occurs there 'rather unusually as a road side weed'.

V.c.6 (N. Somerset)

Chiastophyllum oppositifolium (Ledeb. ex Nordm.) A. Berger (Lamb's-tail). South-west of Winford (ST5364), 20/9/2017, M.Webster: one plant in wall outside Laburnum Cottage, Parsonage Lane. The second vice-county site. A Caucasian rockery curiosity, the fleshy patch-forming leaves are obovate-elliptic, with crenate margins, sometimes variegated and abruptly narrowed to a distinct petiole, 3–6mm long. The flowering stems vaguely resemble a bonsai Laburnum, with pendent racemes borne above the leaves on longish stems to c. 25cm, and crowded with tiny yellow tubular flowers, c. 4–5 mm long. It seems to like walls and the western side of the country, and could be found in the sort of places also favoured by *Arenaria balearica* (Mossy Sandwort), although the species have quite different native distributions. In the past it has been placed in the genus *Umbilicus*, and might be again in the future.

Salvia verticillata (Whorled Clary). Lovington (ST59683130), 3/7/2017, J. Poingdestre: a huge

colony in flower on south-facing railway embankment, 'appearing thoroughly naturalised'. First v.c.6 record since 1967, and the classic habitat for this plant. A European/south-west Asian species, the vector for many of these often persistent railway populations is not at all obvious.

Avena barbata (Slender Oat). Catcott (ST39883983), 12/7/2017, E.J. McDonnell & A. Dockerty: several fruiting plants in gateway, Little Leaze Lane. There have been other recent v.c.6 records in ST45 and ST85. Its British headquarters is in Guernsey (v.c.113).

V.c.9 (Dorset)

Pinus armandii Franch. (Chinese White Pine). North of Wareham (SY8765592809), 8/5/2018, D. Leadbetter: seedling in old arboretum at Sugar Hill. A tree growing to 35m. The mature bark is grey and broken into squarish plates, the crown conical to narrowly pyramidal, 'the long (8–15cm), grass-green leaves in bundles of fives' are triangular in cross-section, with one vascular bundle and three resin canals, one medial and two lateral. The online *Flora of China* differentiates two varieties, the nominate one and var. *mastersiana* with drooping rather than erect pollen cones.

Trifolium resupinatum (Reversed Clover). Weymouth area (SY702818), 3/7/2008, A. Boucher (comm. A. Boucher): a few plants of only c. 7cm height in short rabbit-grazed turf just above the beach at Bowleaze Cove. A possibly increasing species.

Epilobium brunnescens (New Zealand Willowherb). Brownsea Island (SZ0218788039), 22/6/2017, D. Leadbetter: about 100 plants near path known as 'Middle Street'. First record for this area.

V.c.10 (Isle of Wight)

Symphytum caucasicum (Caucasian Comfrey). Ventnor (SZ56667766), 1/5/2018, D. Leadbetter (comm. D. Leadbetter): c. 500 plants in grassland near Devonshire Terrace. 'A wonderful display with bees being attracted to the flowers.' Known here for some years.

Allium cristophii Trautv. (Star of Persia). Freshwater (SZ338871), 6/2014, P. Stanley: on bank at rear of Freshwater Library. The first v.c.10 record. See *BSBI News* 137:57–58.

Pinus armandii, Sugar Hill, near Wareham, v.c.9, 2018. *David Leadbetter*

V.c.11 (S. Hants)

Holodiscus discolor (Ocean Spray). Christchurch (SZ1574192737), 19/8/2018, D. Leadbetter (comm. D. Leadbetter): presumably self-sown at Druitt Gardens, a recently opened 'wild' garden on the Hampshire/Dorset border. Most recent records are for the London area and the north-east of Scotland. A western North American species, it is hard to imagine the means by which its achenes could be dispersed any great distance. See Stace (2010). Clement *et al.* (2005): 150.

Eragrostis pilosa (Jersey Love-grass). Bishopstoke (SU474186), 22/9/2017, M. Rowe (det. T. Cope): in roadside gutter, Oakgrove Road (on the south-east side of Bishopstoke). A new vice-county record. In the past it was known as a wool alien in v.c.12 (N. Hants). Recent records have mostly been from v.c.113.

Symphytum caucasicum, v.c.10, 2018. *David Leadbetter*

V.c.12 (N. Hants)

Chenopodium hybridum (Maple-leaved Goosefoot). North-west of Quarley (SU2534542460), 5/7/2017, S. Little & D. Albon: one plant at arable field edge with *Lithospermum arvense* (Field Gromwell). See v.c.15 (E. Kent) for another record in rather similar habitat. Treated, 'with reservations', as a native in Clement & Foster (1994).

Amaranthus blitoides (Prostrate Pigweed). Cow Down (SU38214326), 10/8/2017, A. Mundell, A. Cross & M. Parker: several plants in an arable field corner, with more at SU38434398 on wasteground near a barn. There can be no better illustration of this plant's extreme prostrate habit than the photo on p. 91 of Stace & Crawley (2015).

Euphorbia stricta (Upright Spurge). Ibthorpe (SU36925312), 12/7/2017, P. Billinghurst: at top of Windmill Hill Lane, in an area next to a garden, recently cleared of trees. Has smaller capsules than *E. platyphyllos* (Broad-leaved Spurge), which are strictly glabrous, and see Stace (2010).

Acanthus spinosus (Spiny Bear's-breech). Eversley (SU76166279), 30/5/2017, A. Mundell, G. Knass & A. Lucas: near the ford. *A. mollis* (Bear's Breech) is much more frequently found. Clement *et al.* (2005): 258.

Bromopsis inermis (Hungarian Brome). Wherwell (SU39054120), 28/8/2017, A. Mundell & A. Stewart: large colony in field, with more at SU39054120. Probably under recorded.

V.c.13 (W. Sussex)

Sedum kimnachii V.V. Byalt (Kimnach Stonecrop). Pagham (SZ8920597383), 1/ 1/2018, S. Denness & D. Nelson: growing in a scrubby area on sand. Sue and Dawn have subsequently noted it growing elsewhere in the Pagham area. The second record for Sussex. According to the BSBI *Sedum* referee, Ray Stephenson, the rather similar *S. confusum* (Lesser Mexican-stonecrop) forms a low bush up to 60cm and has leaves up to 5cm long; *S. kimnachii*, on the other hand, is a lower-growing, sprawling species with leaves up to only c. 2.5cm long.

Convolvulus sabatius Viv. (Ground Blue-convolvulus). West Kingston (TQ0810001482), 18/9/2011, D. Donovan: one square metre patch on beach edge. It was also observed as a garden escape in urban Brighton (v.c.14) by Tony Spiers in 2011 (TQ3054204632). In Clement & Foster (1994) it is described as 'a garden escape on a few walls in Tresco and St. Mary's'. Since then more records have materialised, mainly in the London area and the south-east, nearly all probably of garden origin.

A mat-forming perennial with trailing stems and elliptic leaves with obtuse tips, c. 2cm × 1.5cm. The unlobed, short-stalked, funnel-shaped, violet-blue corollas occur in small groups at the ends of 2–5cm peduncles and measure c. 3.5cm across. The calyces are 8–9mm long and made up of overlapping, ciliate, narrowly-triangular segments; the fruit is an obovoid capsule. The stems, petioles and leaf blades are spreading hairy. A native of Italy and North Africa on well-drained often calcareous/gravelly substrates.

V.c.14 (E. Sussex)

Persicaria microcephala (D.Don) H. Gross (Fleece Flower). Newhaven (TQ4512301400), 18/5/2018, M. Berry & J. Reynolds (det. M. Berry): one immature plant on large soil heap adjacent to the site of a demolished pen factory. This was the cultivar 'Red Dragon', grown for its claret-coloured foliage emblazoned with silver chevrons – the individual leaves are lanceolate with slightly asymmetrical cordate-truncate bases. A native of China, this is the second Sussex record and the first for v.c.14. See Adventives & Aliens News 1, v.c.21.

Caragana arborescens (Siberian Pea-tree). Eastbourne (TQ6395200891), 31/5/2013, M. Berry (conf. E.J. Clement): one self-sown shrub some 10m from a belt of obviously planted specimens, Sovereign Park. See Stace (2010).

Vicia villosa (Fodder Vetch). Newhaven (TQ4427601889), 20/8/2017, M. Berry & J. Reynolds (det. M. Berry): a few plants on wasteground in recently landscaped area, Riverside Park. It could become established here. Only the second recent v.c.14 record. The plants were referable to var. *villosa*.
Lens culinaris (Lentil). Eastbourne (TQ5994300704), 23/5/2018, M. Berry (conf. E.J. Clement): one plant at base of railing, Framfield Way shopping parade. Presumably from bird seed or spillage from shop-

Plantago afra, Hastings, v.c.14, 2018. *J. Rose*

bought packet lentils. The first modern Sussex record, the records of Hilton and Ellman being pre-1937.

Limnanthes douglasii (Meadow-foam). Newhaven (TQ4533400885), 18/5/2018, M. Berry: one prostrate plant on bare stony waste ground, close to where new road is being constructed. A garden annual from western North America, in a family of its own but with affinities to the Geraniaceae. Apparently an increasing casual in Sussex, it is probably not truly established anywhere within the county.

Plantago afra (Glandular Plantain). Hastings (TQ8242110416), 2/6/2018, J. Rose: a number of plants growing along a wall, Emmanuel Road, some as much as 40cm tall. An annual from the Mediterranean, with densely glandular-hairy inflorescences, and see Stace (2010). There were no associates which would implicate bird seed as a vector. Apart from a slight 'spike' (22 records) in the period for 1970–1999, there have been surprisingly few post-1930 British records.

Apera spica-venti (Loose Silky-bent). Eastbourne (TV6047298487), 23/7/2012, M. Berry: one tuft at edge of verge, Meads Road. The plants were mown off before they could fruit. As a recurring species it is strongly associated with sandy arable habitats, but as an impermanent casual it would probably be at home on almost any ground open enough for its needs. The well-named, equally weedy *A. intermedia* Hack. could be passed over as depauperate *A. spica-venti*, or unusually robust *A. interrupta* (Dense Silky-bent). There do not seem to have been any recent British records of this plant.

Panicum capillare (Witch-grass). Eastbourne (TQ6001801115), 22/9/2017, M. Berry (conf. E.J. Clement): on wasteground by road into District General Hospital, off King's Drive. A rather ill-grown plant which had dropped most of its spikelets. Well-grown plants with their relatively sturdy stems and leaves, yet very airily delicate panicles are garden-worthy. Another potential source of records besides the more familiar one of bird seed.

V.c.15 (E. Kent)

Chenopodium hybridum (Maple-leaved Goosefoot). St. Nicholas at Wade (TR25956730), 3/7/2017, C. Osborne: up to 100 plants along potato field edge, 'suggesting the build-up of a seed bank'.

Atriplex micrantha Ledeb. (Twoscale Saltbush). Aylesford Area (TQ74325828), 19/10/2017, S. Poyser & D. Grant: several plants by riverside footpath between Aylesford and the Malta Inn, more or less below the M20. A native of Russia, there have been other recent records from roadsides in v.c.29 (Cambs). For

photographs and identification tips, see p. 7 of *Kent Botany* 2017. One of the plants at this site stood well over 2m tall.

Erodium trifolium Cav. (Heron's Bill). Davington (TR0161), 4/2017, L. Rooney & J. Armishaw: well naturalised in churchyard, with plants at all stages of development. See p. 12 of *Kent Botany* 2017 and Adventives & Aliens News 7.

Origanum majorana L. (Pot Marjoram). Seasalter Beach (TR09496545), 5/9/2017, D. Chesterman (conf. L. Rooney): two mature plants on shingle. Liam also found some seedlings at TR0953965473 on a subsequent visit. See p. 15 of *Kent Botany* 2017 for photos. The first v.c.15 record. This has sometimes been placed in the genus *Majorana* (synonym *Majorana hortensis*), on the basis that its calyces are top-shaped or sheath-like, not bell-shaped and five-toothed like the calyces of other *Origanum* species. These are in any case concealed by the overlapping, glandular-punctate bracts, from behind which the pink or white flowers (c. 4mm long) protrude.

A native of North Africa and south-west Asia and occasionally grown as a pot herb in this country. A probable 'new' record for v.c.16 (W. Kent) has come to light: a non-flowering specimen collected by Ken Bull from a tip at Speldhurst on 22/10/1967, having recently been named as this species by Eric Clement. A note made on the sheet by the collector reads 'very highly aromatic', a diagnostic feature which has not survived the 50 intervening years! (Herb. MCB).

Allium cristophii Trautv. (Star of Persia). Dymchurch (TR1218831281), 3/6/2017, O. Leyshon: growing on grassy inland side of the sea wall.

Allium cristophii Trautv. (Star of Persia). Sandwich area (TR3319459084), 6/6/2017, L. Rooney & T. Hatton: six plants growing in long grass on wasteground at the Discovery Park. See p. 5 of *Kent Botany* 2017.

V.c.16 (W. Kent)

Inula racemosa Hook.f. (Pushkarmool). Brenchley area (TQ6842), 13/8/2017, G. & S. Kitchener: in several places along road between Brenchley and Castle Hill, where it runs between fields east of the junction with Knowle Road. For a photo see p. 27 of *Kent Botany* 2017. Geoffrey remarks that it is less commonly grown in gardens than the similarly impressive *I. helenium* (Elecampane) or *Telekia speciosa* (Yellow-oxeye). The first British record for this Asian species of fleabane.

V.c.17 (Surrey)

Matteuccia struthiopteris (Ostrich Fern). Hindhead (SU86233615), 22/12/2016, E.J. Clement & G. Hounsome: two patches, c. 3m across and one smaller one nearby, on the Surrey side of the county boundary stream in extremely boggy ground. There is a similar patch on the N. Hants (v.c.12) side of the stream at SU86223611.

Carex buchananii (Leatherleaf Sedge). Ripley (TQ04765562), 11/7/2016, G. Hounsome: a large tuft by a BT access point on the north verge of Grove Heath Road, near a garden and possibly planted, but apparently untended for many years.

V.c.24 (Bucks)

Dicentra spectabilis (Asian Bleeding-heart). Great Missenden (SP857010), 2015, T. Marshall: single plant on roadside bank in Hampden Road, Prestwood, 'This is a very rural spot, quite a long way from houses'. *D. spectabilis* has a leafy stem, while *D. formosa* (Bleeding-heart) has all of its leaves in a basal rosette. Recent molecular studies indicate that the former should be segregated as *Lamprocapnos spectabilis* (L.) Fukuhara.

Eryngium × *tripartitum* (Tripartite Eryngo). Great Missenden (SP873007), 30/9/2013, T. Marshall: side of Blacksmith's Lane, Prestwood. According to Clement & Foster (1994) 'probably a hybrid between *E. planum* (Blue Eryngo) and an unknown species'. See Stace (2010).

V.c.28 (W. Norfolk)

Haloragis erecta (Murray) Schindl. (Upright Raspwort). King's Lynn (TF644205), 7/6/2018, R. Stevenson (det. T. Doncaster/comm. R. Stevenson): semi-established population at bottom of fence in a cut-through alley between a cycle track to the west of Spring Wood and a housing estate in the Gaywood area. The cultivar 'Wellington Bronze'. A native of New Zealand which seems to set at least some good seed in this country, its winged or ribbed capsules possibly giving it an advantage over equally fecund but plainer-fruited garden species. See Adventives & Aliens News 8, v.c.10.

Haloragis erecta, Springwood, Kings Lynn, v.c.28, 2018. **Inset:** close-up of flowers. *R. Stevenson*

Ornithogalum nutans, Larkhill, v.c.59, 2017. *P.H. Smith*

V.c.59 (S. Lancs)

Hypericum olympicum (Mount Olympus St. John's-wort). Formby (SD2807807138), 25/10/2015, P.A. Lockwood (comm. Phil Smith): one flowering plant on side of a sandy track near gardens, Wicks Path. Also present in 2016 and 2017. A sub-shrub from Turkey and the Balkans, sometimes grown as a rockery plant, with very glaucous, ovate oblong leaves, large flowers up to 6cm across and strongly overlapping sepals. A drawing by Graham Easy can be found on the cover of *BSBI News* 90.

Knautia macedonica Griseb.(Macedonian Scabious). Ainsdale area (SD3060711657), 3/7/2016, P.H. Smith: one flowering plant near to housing, Falklands Way dunes. First record for the north-west of England. A perennial garden plant, native to the Balkans, with dark red, four-lobed corollas, calyces with eight prominently awned teeth and basal leaves which rarely persist to flowering. It is also sometimes sold under the name of *Scabiosa rumelica*, a combination not listed on IPNI.

Ornithogalum nutans (Drooping Star-of-Bethlehem). Formby (SD2795807409), 17/5/2017, P.A. Lockwood & R. Freeth (comm. Phil Smith): one flowering plant in Sycamore woodland, about 300m from nearest housing, Larkhill. Some authorities would prefer to segregate this as *Honorius nutans*, owing to a number of morphometric distinctions which can be made between it and 'true' *Ornithogalum* species. Plants now available from garden suppliers could sometimes be its hybrid with the very closely related *O. boucheanum* (Kunth) Aschers.

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Can gardeners help identify ornamental plants at risk of becoming invasive?

JUDITH CONROY & KATHARINA DEHNEN-SCHMUTZ

Lamiastrum galeobdolon ssp. *argentatum* growing with *Circaea lutetiana* (Enchanter's-nightshade) in a Dorset garden. *Andrew Branson*

The most significant pathway at a global level for plant invasions is the deliberate introduction of non-native species for ornamental horticulture. Almost half of the non-native plants in the British flora can be traced back to horticultural introductions. To deal with this problem, the large number of non-native plants already present in gardens has to be taken into account.

There is often a delay of several decades from the initial introduction of a species and its identification as a problematic plant outside of cultivation, which will vary depending, among other reasons, on the number of individuals released in space and time. As plants become more widely sold, swapped or otherwise available, their escape and establishment outside gardens becomes more likely. It is probable that climate change will accelerate this process, triggering in the UK the invasion of plants not previously considered fully hardy.

There have been relatively few studies of plant diversity in both public and private gardens, but those that have been conducted show that around 70% of species grown in gardens are non-native. In their efforts to give plants optimal growing conditions and control those that dominate, gardeners are well placed to identify plants with traits that may make them more likely to be successful garden escapes.

We wanted to explore whether a 'citizen science' approach, involving gardeners, could generate species-specific data beyond that collected by recording schemes operating outside gardens.

In recent years, citizen science has become a popular and established method of collecting biological records. Schemes such as iRecord have made it easier for the public and experts to work together to collect and verify wildlife sightings. This has included recording invasive plant species outside of gardens, but we wanted to take a slightly different approach and identify plant species not yet present outside of cultivation, but which nevertheless display traits within gardens that may indicate their potential to be invasive in the wider countryside in the future.

We asked gardeners, including several who are BSBI members, to complete a survey, reporting up to five ornamental plants that were spreading and proving difficult to control or eradicate within their gardens. Gardeners were also asked how the plants

Tetrapanax papyrifer for sale at a nursery. *Judith Conroy*

arrived in their gardens, by what means they were spreading, how they managed these plants and what measures had been taken to control or to remove them. We compared all records received to the BSBI database.

Results

We received records from all over Great Britain, from Cornwall to Inverness. A total of 56 respondents reported an average of 3.6 plants each, making 201 records in all; 121 different species were recorded, with 32 included by more than one gardener. Seventeen species were native. *Anemone scabiosa* (*A.* × *hybrida*), *Hyacinthoides hispanica*, *Lamiastrum galeobdolon* ssp. *argentatum* and *Crocosmia* × *crocosmiiflora* were the most frequently reported species, present in six gardens each, although there were a further four records for *Crocosmia* at genus level, making it the most reported plant overall. Significantly, eight species had not been recorded outside of cultivation in the UK (Table 1), but four of these, including *Anemone sylvestris* and *Tetrapanax papyrifer* (both available from a number of plant suppliers), are listed as being naturalised outside of their native range elsewhere in the world. Thirty-two species currently have UK distributions of fewer than 100 hectads, but all species with records outside cultivation are increasing their range and are now present in more hectads than in 2000.

Reports of these less frequent or non-naturalised plants show that this approach of collaborating with gardeners may be useful in identifying plants in the early stages of the invasion process. Further examination of their potential invasiveness, including risk assessments, may be an effective way of preventing possible invasions of plants with negative impacts. A wider application of the approach, for example, a long-lasting webtool where gardeners are able to report such plants, could therefore be a useful additional source of information for invasive species managers.

Table 1. Species not known outside cultivation in Britain but reported from gardens as spreading and difficult to control.

Species	Family	Origin	Naturalised
Arctotheca prostrata	Asteraceae	South Africa	yes
Moraea huttonii	Iridaceae	South Africa	no
Tetrapanax papyrifer	Araliaceae	Asia	yes
Carex trifida	Cyperaceae	New Zealand	no
Libertia peregrinans	Iridaceae	New Zealand	no
Anemone sylvestris	Ranuncula-ceae	Europe	yes
Geranium cinereum	Geraniaceae	Europe	no
Asclepias speciosa	Apocynaceae	North America	yes

We would like to thank the BSBI for promoting the survey and all those who took part and helped with this research. The full results of the study are now published (Dehnen-Schmutz & Conroy, 2018) and if you would like to receive a copy of the published paper, please email judith.conroy@coventry.ac.uk.

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Caravan touring sites – an overlooked habitat for introduced species

COLIN POPE & PAUL STANLEY

Paul Stanley and Eric Clement examining the turf of an Isle of Wight caravan touring site. *Colin Pope*

In 1997, over 500 plants of *Soliva pterosperma* (Jo-Jo), a native of South America, were discovered by Felicity Woodhead in short turf in a touring caravan park in Bournemouth, Dorset, scattered over a distance of at least 100m (Woodhead & Clement, 1997). The plants were mostly concentrated near (and under) the caravans, growing in both barer patches of soil and amongst the dense, short turf. Up to that time, the only records for the British Isles for this species were as casuals introduced with wool waste. However, although a native of South America, *S. pterosperma* is widespread as an established weed outside of its native range. Eric Clement wrote that the sharp spine on top of the achene can pierce footwear and car tyres, which may explain its origin, perhaps coming to us via tourists from the Iberian peninsula, where it is well established. He went on to suggest that: 'It seems very likely that this plant has been overlooked elsewhere in southern England. Who can find another colony in Britain? Walking on caravan parks, seaside and other short turf in bare feet might be a good method – volunteers are required and, yes, it does puncture human skin.' In fact, the only other record in the BSBI Distribution Database was again from Felicity Woodhead, this time on a playing field to the south of Bournemouth Airport. There were still plants to be found at the (re-developed) Bournemouth caravan park site in 2012 (Woodhead, 2013).

In 2015, several interesting alien plants from southern Europe were found growing in sandy ground at camping sites along the Belgian coast, some apparently never previously recorded before in Belgium (Verloove, 2016). It was considered that the plants – often with spiny, hooked or bristled fruits and/or with tiny seeds – had been introduced unintentionally with tourists coming from southern Europe (adhered to car mats, tents and other camping equipment). A more intensive survey of caravan parks along the Belgian coast in 2016 found that many of these alien plants were quite widespread.

In the spring of 2017, Paul Stanley was searching for *Anacamptis morio* (Green-winged Orchid) at a known site at Nodes Point Holiday Camp by the coast at the eastern end of the Isle of Wight. He was unable to refind the orchid, but he soon came across *Soliva pterosperma* in some quantity. In common with the find in Bournemouth, plants were concentrated on camping pitches, on barer patches of soil and amongst dense, short turf and the extent of the colonies indicated that the plant must have been present here for many years. When Eric Clement visited the site he

Solvia pterosperma growing in thinly vegetated soil of a caravan site. **Inset** spines in Eric's hand. *Colin Pope*

Cotula australis at Nodes Point campsite, Isle of Wight. *Colin Pope*

was able to confirm through personal experience that the spiked achene can indeed penetrate human skin!

Further investigation revealed that the Nodes Point Holiday Camp supported a rich adventive flora. *Trifolium micranthum* (Slender Trefoil), *T. ornithopodioides* (Bird's-foot Clover), *Medicago polymorpha* (Toothed Medick), *Crassula tillaea* (Mossy Stonecrop) *Capsella rubella* (Pink Shepherd's Purse) and *Poa infirma* (Early Meadow-grass) all proved to be scattered but quite widespread on pitches. Some of these are native species, but their abundance suggests that they have been spread by man's activities. *C. tillaea* and *P. infirma* are native species which have been increasing in this country within the last 20 years. Whilst this increase has been aided by climate change, a question has always arisen as to how much of this spread was natural and to what extent this was aided by human agency. The spread of both species in coastal regions is probably a combination of natural and human factors.

Other rarer finds included locally strong colonies of *Spergularia bocconei* (Greek Sea-spurrey), *Cotula australis* (Annual Buttonweed), *T. resupinatum* (Reversed Clover) and a small colony of *T. tomentosum* (Woolly Clover). This last group are new or first modern v.c.10 records. The suite of species recorded is remarkably similar to that recorded from coastal touring sites in Belgium, suggesting a common origin for these species.

Investigation of other touring sites on the Isle of Wight found that *S. pterosperma* was quite widespread. Each site was different and no site to date has been found which is as rich as Nodes Point Holiday Camp. Nevertheless, the more widespread species at Nodes Point have proved to be not infrequent at touring sites elsewhere, particularly those on free-draining soils. Additional sites have been found for all the species referred to, apart from the two rare clover species.

Following these discoveries at camping sites across the island, Paul Stanley has been investigating campsites further afield. Both *P. infirma* and *C. rubella* appear to have been present on almost every campsite so far investigated, whether this be coastal, from Somerset to Lincolnshire, or inland in places such as Wiltshire and Northamptonshire. The presence of large populations of *P. infirma* and *T. ornithopodiodes* at the inland campsite at Billing, Northamptonshire, lends weight to the theory that man-influenced factors are responsible for dispersal inland.

Solvia pterosperma, the initial species that has triggered the investigation, has been found to be present in abundance on a number of touring sites in Dorset and South Hampshire, but on the cooler east coast of Essex, East Suffolk, East Norfolk and West Norfolk, the populations have been much smaller. Hounsome (2013) draws attention, via some excellent drawings of achenes, to the complexity of the genus *Soliva* and that *S. valdiviana* is also established in England. Closer inspection of the achenes of *Soliva* populations at two campsites in South Hampshire by

Paul Stanley and Eric Clement confirmed the presence of *S. valdiviana* among the populations of *S. pterosperma*. Identification is otherwise probably not consistently reliable. For *S. valdiviana*, this represents an alternative habitat for a species which so far has been recorded on a golf course and a cricket pitch.

Paul Stanley has found small populations of *S. pterosperma* at Heath Beach campsite, Kessingland, East Suffolk (v.c.25) and Vauxhall Holiday Park, Great Yarmouth (v.c.27), growing with very large numbers (thousands of plants) of *C. australis* (Berry, 2018). Unlike these two species, some campsite aliens have been less consistent in appearance. *S. bocconei*, outwith the Isle of Wight, has so far been found only at a campsite in Essex. Similarly, *T. resupinatum* has so far been recorded at one site in Cambridgeshire. *Polycarpon tetraphyllum* (Four-leaved Allseeed), a plant found on a number of Belgian campsites, was recorded on a hard standing at Hunstanton, West Norfolk.

Touring campsites appear to be a somewhat under-recorded habitat and yet anthropochorous dispersal by tourism is recognised as being an unwelcome vector of alien plants in many parts of the world. To date, it is clear that many of them are likely to harbour interesting, but unrecorded, suites of naturalised species and there is great potential to investigate this further. Coastal sites on free-draining soils are likely to be most fruitful, but inland sites are also worth studying. Interesting communities of plants seem to be confined to compacted and often bare soil on sunny camping pitches. Areas where grass-parking ground-reinforcement grids have been installed are often productive sites. It would be of great interest to map how extensively this thermophilous southern European community of plants has become established in this country and how, over time, this may change. *Crassula tillaea* has, in the last 20 years, appeared in many new sites well to the north of its native range in southern England and it is thought that the seeds of this stonecrop are most likely to have been transported on the tyres of vehicles.

Other species recorded at campsites along the Belgium coast but not currently known to be present in touring sites in this country are *Ranunculus muricatus* (Rough-fruited Buttercup), *Galium murale* (Small Goosegrass), *Medicago littoralis* (Shore Medick), *Trifolium nigrescens* (Dark Clover) and *Parentucellia latifolia* (Southern Red Bartsia).

Bryologists are also taking an interest in touring sites. Mediterranean oceanic bryophytes such as *Sphaerocarpos* spp. and *Riccia crystallina* are starting to turn up on campsites in southern England, spread by the activities of tourists (Gearge Greiff, pers. comm.).

Trifolium resupinatum at Nodes Point campsite, Isle of Wight. *Colin Pope*

Acknowledgments

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Changing status of *Solanum triflorum* at Formby Point, on the Sefton Coast

PHILIP H. SMITH, PATRICIA A. LOCKWOOD & JOSHUA STYLES

Solanum triflorum in flower, Formy Point. *Phil Smith*

A native of western North America, *Solanum triflorum* (Small Nightshade) is rare in Britain and Ireland, having been recorded since 2000 in only seven hectads (one post-2010) (BSBI Maps). Also known as Cutleaf Nightshade, it was first found by Peter Brash in 2009 as a new species for South Lancashire (v.c.59) and the Sefton Coast near the office of the National Trust, Formby Point, 15 plants being counted around a sandy rabbit warren on a former asparagus field (Smith, 2010). The species was seen here sporadically in some years thereafter, but no follow-up survey was attempted.

While attending a meeting with National Trust staff on 30th August 2017, PHS recognised a plant of *S. triflorum* in the office car park. This prompted our visit the following day to investigate the current status of the plant. We searched an area of about 2.25ha, comprising an informal car park, lightly surfaced with stone chips, spoil heaps, former asparagus fields supporting rabbit-grazed dune grassland, a dung heap, a lined pond, sandy vehicle trackways and the bare sand edges of a working asparagus field. A central grid reference is SD277077. A total of 62 plants of *S. triflorum* was counted, many of them supporting flowers and well-developed fruits. A majority (38 plants) was associated with disturbed ground along the edge of a working asparagus field (Table 1). Several other regionally or nationally notable plants were noted in the study area, including *Erodium lebelii* (Sticky Stork's-bill), *Erodium* × *anaristatum* (Hybrid Stork's-bill), *Filago vulgaris* (Common Cudweed) and *Hypochaeris glabra* (Smooth Cat's-ear) (Table 2).

Table 1. Habitats of *S. triflorum* at Formby Point on 31st August 2017

No. of plants	Habitat
1	Gravel car park
3	Sandy vehicle track
2	Former asparagus field and pond edge
18	Sandy grassland adjacent to dung heap
38	Disturbed edge of asparagus field
Total 62	

Evidently, *S. triflorum* has become quite well established at Formby Point over a period of at least nine years, although Stace (2010) reports it as naturalised only in West Norfolk and Cheviot. This is a ruderal annual dependent on disturbed sandy ground,

Table 2. Scarce vascular plants recorded in study area at Formby Point, 31st August 2017

Taxon	English name	Number or frequency	Status on Sefton Coast	National & Regional status
Chenopodium rubrum	Red Goosefoot	1 plant	Occasional	SCI
*Epilobium brunnescens**	New Zealand Willowherb	1 plant	Rare	Widespread but mainly upland
Epipactis phyllanthes	Green-flowered Helleborine	2 plants	Occasional	Nationally Scarce, SCI
Erodium x *anaristatum*	Hybrid Stork's-bill	Occasional	Locally frequent	Coastal dunes in Wales and South Lancs.
Erodium lebelii	Sticky Stork's-bill	Occasional	Occasional	Nationally Scarce; SCI
Filago vulgaris	Common Cudweed	c. 50 plants	Rare	NT Great Britain, NT England, SCI
Hypochaeris glabra	Smooth Cat's-ear	50+ plants	Occasional	VU Great Britain, VU England, SCI
*Solanum triflorum**	Small Nightshade	62 plants	Rare	7 modern hectads in Britain, 1 post-2010
Vicia lathyroides	Spring Vetch	1 plant	Occasional	SCI

* = non-native; NT = Near Threatened; VU = Vulnerable; SCI = Species of Conservation Importance in north-west England

so current management of the area is favourable to its continued survival.

Acknowledgements

We are grateful to National Trust staff for permission to visit and to Andrew Brockbank for showing us the colony of *Filago vulgaris*.

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Solanum triflorum fruits, Formy Point. *Phil Smith*

Cucurbita moschata (Butternut Squash): a follow-up

MATTHEW BERRY

Following the appearance of my note on *Cucurbita moschata* (Butternut Squash) in *BSBI News* 136 (see pp. 57–58), I was contacted by Drs. Anne Kell of Ipswich and Chris Preston of Cambridge. The observations, photographs and plant material I received from them have provided me with the solid basis for a follow-up.

The first point to make, based on their feedback, is that *C. moschata* is apparently grown on allotments in southern England, if not elsewhere in Britain, so climatic factors would not seem to present an insuperable barrier to its cultivation here. This might not have been the case until quite recently. Whether it is also grown on a larger commercial scale in Britain is something that would be worth investigating. Seed formation probably depends on temperatures being high enough for the right period – none developed in the squashes harvested by Anne in Ipswich in 2017, for example.

Secondly, both thought it quite likely that Robin Stevenson's King's Lynn plant was *C. moschata*, based on a comparison of plants in local cultivation with those in Robin's photos (see *BSBI News* 136, Colour Section 3). And after looking at their photos of Ipswich and Cambridge allotment specimens, and by matching the allotment material sent to me by Anne with the various descriptions, I have to say that I would be happy to confirm Robin's plant as this species. Eric Clement, who was pleased to receive surplus material to fill a gap in his herbarium, also agreed. While the possibility of a mistake on the part of British seed suppliers cannot be entirely excluded, I think it is very unlikely. I should also add at this stage that a record for *C. moschata* has since entered the DDb. It is for hectad HP50 in Shetland (v.c.112)!

Cucurbita moschata female flower, Ipswich (v.c.25). *A. Kell*

Chris also sent me part of a *Cucurbita* key from a paper in *Gentes Herbarum*. This was a journal founded and edited by the American botanist L.H. Bailey. Published by Cornell University, it was available to subscribers from 1920 possibly up to the time of Bailey's death in 1954. I imagine that hard copy is very difficult to come by, but fragments are apparently downloadable from the web. It would seem potentially to be a very useful resource, for plants of horticultural and agricultural importance in particular, and I am very grateful to Chris for drawing my attention to it. The most reliable characters presented in the key probably relate to the seeds of *C. moschata*, which are quite different to those of *C. pepo* (Marrow) and *C. maxima* (Pumpkin), being described as white and having 'a thin or ragged deeper coloured margin which is more or less wavy and shreddy and somewhat hyaline', while those of *C. pepo/maxima* are described as being white and 'thick-edged'. However, as ripe seeds might be formed only rarely in this country, these characters could be of limited utility to British field botanists.

This brings us onto leaf indumentum, which I highlighted as being particularly useful in my previous note. The leaves of *C. moschata* are 'soft hairy without prickly setae' (cf. those of *C. pepo/maxima*, described as being 'prickly or with setae among the hairs'). A note of caution should perhaps be sounded, however. Anne makes the interesting observation that while they are softly hairy to begin with, the leaves become more 'hispid' with age. So perhaps this character is

somewhat time-dependent, haptically at least if not microscopically.

A particularly interesting additional detail from the Bailey paper is that the calyx lobes of male flowers of *C. moschata* are often 'foliaceous' (cf. rarely or never so in *C. pepo/maxima*). This was certainly the case for the male flowers in the Ipswich material. This is not, however, what F. Verloove means when he refers to the calyx lobes of *C. moschata* as not being linear like those of *C. pepo/maxima*. In fact, I did him an injustice in my last note on this subject, when I stated that he did not explain how they differed. In the key linked to his paper on *C. moschata*, the calyx lobes of the latter are described as 'lanceolate, widening at base', those of *C. pepo/maxima* as 'linear, with parallel sides'. I would describe the calyx lobes of the female flowers of the Ipswich *C. moschata* material as being linear-subulate.

Other differences mentioned are for the calyx tube of male flowers: short or almost absent in *C. moschata*, obvious and bell-shaped in *C. pepo/C.maxima*; and for the fruit stalk at the fruit/peduncle (pedicel?) junction: greatly distended in *C. moschata*, rarely or never so distended in *C. pepo/C.maxima*. Although the fruiting pedicel of *C. pepo* is uniformly thickened and fluted.

The male flowers of the Ipswich plants were long-stalked and the female flowers short-stalked, in agreement with the description from the Missouri Botanical Garden website, see *BSBI News* 136: 58. This is not to say very much, however, as it would seem to be a characteristic it shares with other cucurbits.

No reference is made to white spots on the leaf veins of *C. moschata* in the Bailey paper, nor were any evident on the leaves of the Ipswich plants, or in the photos of Cambridge plants. Perhaps this character is found in certain cultivars of *C. moschata*, while being entirely absent from others.

In conclusion, there is also anecdotal evidence based on the sourcing of commercially available *C. moschata* seed, that this species is grown on a field scale in France and Italy (pers. comm. C. Preston), thus hinting at a wider situation which might be at odds with Verloove's assertion that it is rarely cultivated in western Europe.

I would like to thank Anne Kell and Chris Preston for their richly generous feedback, Eric Clement for perusing an earlier draft of my note, and Robin Stevenson for getting this botanical ball rolling in the first place.

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Some additional characters for *Allium pendulinum* (Italian Garlic)

As a native *Allium pendulinum* Ten. (Italian Garlic) is confined to mainland Italy and the associated islands of Corsica, Sardinia and Sicily, growing in damp shaded habitats up to 1,000m above sea level. In Britain it is grown rarely as a garden plant, with the DDb revealing a handful of records divided between eight hectads (for the vice-counties of W. Kent, S. Essex, Middlesex, E. Norfolk and S./W. Lancs). It is differentiated from *A. triquetrum* (Three-cornered Leek) in key C on p. 899 of Stace (2010), and by the couplet on p. 14 of *BSBI News* 26, reproduced below:

Umbel unilateral; fls always pendent & campanulate, lvs usu. 2-3; capsule 6-7mm…….*A. triquetrum*

Umbel diffuse; fls patent and stellate, later pendent and campanulate; lvs 2, soon withering; capsule 4-6mm…….*A. pendulinum*

To all of this could be added some supplementary characters relating to the veining of the tepals. Adaxially, the tepals of *A. pendulinum* have three distinct but fine green veins, the median one reaching virtually to the tip, the laterals fading at about the halfway mark. These veins are also obvious on the reverse side of the tepals, but there is, in addition, a broader paler green band or smudge proximally, quite unlike the tepals of *A. triquetrum* with their solitary thick, green, median veins, front and back. The facies of *A. pendulinum* is quite different, too. It is simply more delicate-looking, more elegant, if you like.

These characters are beautifully illustrated by the sequence of photographs at www.floraitaliae.actaplantarum.org/viewtopic.php?t=1498, with some additional images at www.actaplantarum.org/galleria1.php?aid=1067. On the same page of what is an excellent website all round, there is also a species description of *A. pendulinum*, which given the Latin roots of so much botanical terminology, hardly requires translation!

Matthew Berry

COUNTRY ROUNDUPS – ENGLAND

PETE STROH

After a wet and cold spring, when the first flowering of many species was delayed by two or three weeks, as I write the country is in the grips of a heatwave, grasslands are brown and tinder dry, and many species have flowered and 'gone over' in the blink of an eye. This weather may be good news for some as drought can influence species composition, with tiny annuals able to flourish on open ground that in most years would be carpeted with vegetation. *Lotus angustissimus* (Slender Bird's-foot-trefoil) is one of a number of species that tend to do well in summers following a drought year, although it seems to have peaked rather earlier than expected in Essex, where it was found in June this year at a new site, at the extant eastern and northern limits of its range in Great Britain, with a dozen or so patches flowering in the cemetery at Stanford le Hope.

Two new Rare Plant Registers (RPRs) have been produced this year: for Oxfordshire and for neighbouring Warwickshire. The former is available to order as a book, and the latter as a book or as a free download. I thoroughly recommend both publications. Many England RPRs are available online and are updated regularly, so can include discoveries of species found at new localities, and also recent arrivals new to the county. Several nationally rare or threatened species have adaptations that allow for long-distance dispersal and/or emergence via a long-lived seed bank, if only the seeds (or spores) fall in the right spot or soils are disturbed when conditions are optimal. *Cynoglossum germanicum* (Green Hound's-tongue), Nationally Rare in Great Britain, is considered a troublesome weed in some areas, such as North America, outside of its native range. Its burrs can stick to the feet, fur or coats of wandering animals, not to mention the socks of ramblers. It appears to be an opportunist, and the seeds, if dispersed to suitable areas that lack competition, can readily germinate, amply illustrated by a boost in numbers following the 1987 storm (resulting in a revision of its GB status to 'Near Threatened' from 'Critically Endangered'). In east Gloucestershire, John Day has reported that it has turned up at a completely new site and in some abundance. The nearest known population, found in Tewkesbury, lies about 20km away.

Torilis arvensis (Spreading Hedge-parsley), another species with fruits that are minutely hooked, also appears to be having a resurgence, with a number of new sites found in the east Midlands, Cambridgeshire and 'wider Fenland'. *T. nodosa* (Knotted Hedge-parsley) is not as rare, but still a pleasure to find, and has been turning up in pavement cracks and curb-sides across many areas of south-west, southern and eastern England, and is certainly one to look out for when botanising in urban areas.

Zostera marina (Eelgrass), a 'Vulnerable' species capable of long-distance dispersal in water (see Källström *et al.,* 2008), has been found by an intrepid group of Somerset botanists covering over 1ha of mudflats in Bridgewater Bay NNR. It was last seen in the county in 1969.

If wind-dispersal is your thing, then there are few plants better adapted than orchids, given their dust-sized seeds, although subsequent germination and establishment is quite another matter. One particularly tall and spectacular species, *Himantoglossum hircinum* (Lizard Orchid), has had mixed fortunes over the past century, but since the turn of the millennium appears to be on the up, with a number of new sites found in 2018, including one in East Sussex (adhering to the rule that new populations of rare species will always be found immediately after the publication of a Flora), and a first county record for Leicestershire on a road verge where it was rubbing shoulders with *Platanthera chlorantha* (Greater Butterfly-orchid) and *Ophrys apifera* (Bee Orchid). Thanks to Matt Berry and Geoffrey Hall for this news.

Just as exciting, perhaps more so, is to find new populations of rare or threatened species that are relatively sedentary, persisting undetected at a site for years without being noticed,


Left *Carex filiformis*. *Pete Stroh* **Right** *Asplenium* x *clermontiae*, Buckinghamshire, 2018. *Andy McVeigh*

ticking along without being 'ticked'. In Essex (again), Graham Glombek found a healthy population of *Carex filiformis* (Downy-fruited Sedge) this spring in ancient grassland within the Basildon Meadows SSSI complex, extending the known easterly range of this species considerably. And *Drosera anglica* (Greater Sundew) – one of my favourite plants – has been found after an 'absence' of 100 years in Staffordshire by Hayley Dorrington at Gentleshaw Common SSSI, in an area that had been badly burned six weeks previously.

Even at sites where one might assume the flora is well known, there are still discoveries to be made. But such finds are certainly not limited to areas already heralded as some of the best in the county or country. In Oxfordshire, David Morris has written to say that a substantial new population (probably many tens of thousands) of *Oenanthe silaifolia* (Narrow-leaved Water-dropwort) was found at a large, privately-owned unimproved floodplain meadow by the Cherwell this year. Down in South Devon, Roger Smith, Andy Byfield and Sue Goodfellow asked for permission to explore privately-owned fields sloping down towards the West Dart River and were rewarded with a second population in the county for *Vicia orobus* (Wood Bitter-vetch), found in fruit amongst *Molinia* tussocks. The area turned out to be very rich, with masses of *Sanguisorba officinalis* (Great Burnet), *Serratula tinctoria* (Saw-wort), *Trifolium medium* (Zigzag Clover), *Lathyrus linifolius* (Bitter-vetch) and a number of locally rare sedges. We may be one of the best botanised country in the world, but there are still places to be discovered. And befriending local landowners and land managers goes a long way – more often than not they will be happy for you to explore their land, especially if you ask first!

Finally, I must mention two more spectacular finds. A single plant of the hybrid between *Asplenium ruta-muraria* (Wall-rue) and *A. trichomanes* ssp. *quadrivalens* (Maidenhair Spleenwort) = *A.* x *clermontiae* was found by Andy McVeigh and Julia Carey (conf. Fred Rumsey), growing with both parents on brickwork (in mortar) near to Tingewick, Buckinghamshire. This is a first for England, and only the second record for Britain and Ireland. In a notably rich botanical area on the limestones of eastern Westmorland, Mike Porter has let me know that Sean Cole and a small group of botanists discovered a single plant of *Dactylorhiza* x *viridella*, the hybrid between *D. viridis* (Frog Orchid) and *D. purpurella* (Northern Marsh-orchid), growing in close proximity to both parents. This hybrid has been recorded from sites in Scotland, but this is the first record for England for more than 60 years, the only previous records being from two sites in Co. Durham in the 1950s.

Thank you to all who have sent me information, apologies for not being able to include all of your wonderful discoveries in this ever-lengthening note, and please do get in touch if you missed the boat for this *News*, but have tales to tell for the next edition.

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COUNTRY ROUNDUPS – SCOTLAND

IAN STRACHAN & JIM MCINTOSH

With only two field-seasons remaining, recording for *Atlas 2020* is gathering pace. This summer we held three week-long field meetings in Scotland, one based in mid-Argyll (Loch Goil), one in Wigtownshire and the third at Kingie Lodge in the northern part of Westerness. Fuller reports will appear in due course, but all were very successful and productive.

At Kingie we explored under-recorded areas around Loch Cuaich (Quoich) with help from the Kingie Estate boat, and also around Loch Hourn, Glen Garry and the Great Glen. Each day a party also ventured into Easterness with local recorder Adam Fraser. There were many interesting finds, but the highlight for me was on the final day when Paul Smith, Gordon Rothero and I scrambled up the gorge of the Allt Daingean, north of Loch Garry. It was hard work, but there was plenty to see. Somewhat wearily we ascended further to a boggy plateau on the hillside at 460m altitude. Much of the bog was heavily eroded, but in one intact area with bog pools Paul spotted a plant he didn't recognise: the Nationally Rare *Scheuchzeria palustris* (Rannoch-rush). We counted 44 fruiting heads, along with much *Carex limosa* (Bog Sedge). This remarkable new site for *S. palustris*, the third for Westerness, is over 40km north of its previously known range, which is centred on Rannoch Moor, and raises the possibility of more sites for this shy flowerer to be found.

Scheuchzeria palustris in fruit at Glen Garry, 2018. *Ian Strachan*

In April, Jeff Waddell refound *Gagea lutea* (Yellow Star-of-Bethlehem) in Kelso on an island in the River Tweed, Kelso Anna, where it was last seen in 1996. This rather scarce species often occurs as small, scattered populations on shady river banks, with rather few localities known in the Borders. On Kelso Anna, Jeff found just a single flowering stem amongst dense *Allium paradoxum* (Few-flowered Garlic), a highly invasive garden escape, which Michael Braithwaite considered to be 'much the most invasive neophyte' in neighbouring Berwickshire, especially along river corridors (Braithwaite, 2014). It spreads readily by means of bulbils produced in the flower heads. It is therefore of some concern that this species was newly found in 2018 in Westerness, at Oich Bridge, and on Skye, at Caroy.

In Fife, Sandy Edwards found plentiful *Allium scorodoprasum* (Sand Leek) by the coastal path near Inverkeithing. He also refound the archaeophyte *Papaver argemone* (Prickly Poppy) near Wormit. In Kincardineshire, David Elston reports that *Atlas 2020* stimulated the first botanical recording trip for many years to Mount Battock, the highest peak in the vice-county, at 778m altitude. Several patches of *Cornus suecica* (Dwarf Cornel) were discovered, the first record for Kincardineshire.

Asplenium septentrionale (Forked Spleenwort) is a nationally scarce fern of rock crevices, walls and mine spoil, which seems to be declining in its 'natural' habitat. It is rare in Scotland, but Duncan Donald has recently found several populations in West Ross and Cromarty. Two were at historical locations, but he also found a completely new site in July, in a north-facing crevice on Cliff Hill, Poolewe. This is a new hectad record for NG88.

It is no longer startling news, but the weather has been extraordinarily warm and dry in the Highlands since May. One possible consequence seems to have been plentiful flowering of *Utricularia stygia* (Nordic Bladderwort), normally a rare event. I saw many near Loch Assynt in June, others were seen during the Kingie meeting and

Stephen Bungard pictured one from Strath Mòr, on Skye, in his blog. He also found *Hammarbya paludosa* (Bog Orchid), which was last recorded there in 1976, and seems to be having a good year – several new sites were found during the Kingie week.

Two new locations for *Cephalanthera longifolia* (Sword-leaved Helleborine) have been found in Ardnamurchan. In late May, Aileen and Lee Thicket reported a group of plants near Ardnamurchan Point, in unusual habitat – grassland with wind-blown shell-sand. This is a well visited area and therefore a surprise addition. Possibly it was more obvious this year as there were no livestock present. Then in early June, Liz MacDonald found plants in more typical habitat on the wooded slopes below Ben Hiant. Both these records are in new hectads, increasing the number of known sites in Westerness to six.

Unimproved grasslands and hay meadows are rapidly disappearing habitats in Scotland. In June, I ran a training day on wildflower meadows and their flora, initiated by Lochaber Biodiversity Group, and organised by Nevis Landscape Partnership under its 'Citizen Science' programme. We visited Bohuntin, in Glen Roy, where the meadows had not yet been cut for hay so could be seen in their full glory. The highlight was a wonderful display of orchids, including an exceptional abundance of *Platanthera chlorantha* (Greater Butterfly-orchid), with many hundreds of plants. Lynne Farrell counted 1,200 spikes of this orchid in a meadow at Pennyghael on Mull, perhaps one of the largest populations in Scotland. Also on Mull, *Anacamptis pyramidalis* (Pyramidal Orchid), found for the first time on Calgary dunes in 2016, was flowering again this summer, apparently benefitting from fencing and reduced grazing. Lynne had less success trying to refind it in grazed coastal turf at Ardalanish, south-west Mull, where it was found in 2009, although *Coeloglossum viride* (Frog Orchid) was in flower.

David Hawker reports that a new site has been found for *Ophrys apifera* (Bee Orchid) in Kirkcudbrightshire, some 35km from its only other site in the county, discovered in 2012 near Castle Douglas. He also found a third vice-county location for *Viola reichenbachiana* (Early Dog-violet), a rare species in Scotland, here thought to be near the northern limit of its native range.

In Lanarkshire, Michael Philip and Jeff Waddell revisited the colony of *Hordelymus europaeus* (Wood Barley), first discovered in 1987 in streamside woodland at Fiddler's Gill, north-west of Lanark. This is the only modern Scottish locality for this Nationally Scarce grass, which is otherwise restricted to shaded habitats in England and Wales. They found 36 plants, compared to 20 recorded by Peter MacPherson in the 1990s. They also found two new colonies of *Paris quadrifolia* (Herb Paris). A very different grass *Catapodium rigidum* (Fern Grass) turned up near the Glasgow Science Centre, only the second record for the vice-county.

Scotland is a stronghold for *Carex aquatilis* (Water Sedge), although it is rare in the north and west. Dave and Pat Batty confirmed it this year at its only site in Kintyre, where they first found it in 1995. It grows on the east coast where it covers a large area on raised beach deposits close to the shore. In the Knapdale area, around the Crinan Canal, their close inspection of *C. acutiformis* (Lesser Pond-sedge) stands revealed plants that did not quite match up to either *C. acutiformis* or *C. riparia* (Greater Pond-sedge). Thanks to the expertise of sedge referee Mike Porter, some of the plants on the side of the canal were identified as the hybrid *Carex* x *sooi* (*C. acutiformis* x *C.riparia*). This is a very rare hybrid in Britain, previously known only from a few sites in southern England, but perhaps overlooked because it is so difficult to identify. It was found on both sides of the canal, which is the border between Kintyre and Main Argyll, so resulting in two new vice-county records!

We look forward to welcoming many of you to the Scottish Botanists' Conference (formerly Scottish Annual Meeting) on Saturday 3rd November at the RBGE. For details see the enclosed flyer.

With thanks to Jim McIntosh, BSBI Scottish Officer, and all contributors.

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COUNTRY ROUNDUPS – WALES CYMRU

JAMES ROBERTSON & JULIAN WOODMAN

Paul Green stepped down as BSBI officer for Wales in July. He will be missed by his many botanical friends in Wales, who will wish to join us in sending him our best wishes. Some of what follows is based on Paul's report for the *Welsh Bulletin*.

Paul organised three early season meetings, at Freshwater West, on 25th March, a *Viola* workshop at Port-Eynon a month later and a walk at Mwnt, on the Cardiganshire coast, on 3rd May. On all three occasions the weather was fine, but flowers were in short supply because of the lateness of the season, but at Mwnt there were many uncommon species, such as *Moenchia erecta* (Upright Chickweed) and *Sagina subulata* (Heath Pearlwort) on the steep rocky slopes, where both were abundant and in full flower.

The uncharacteristically hot, dry summer has had a striking impact on vegetation, leaving aside the effect of a number of serious fires. Some of the more dominant plants which are inclined to take over rocky outcrops, such as *Hedera helix* (Ivy), *Ulex europaeus* (Gorse) and *Rubus* agg. (Bramble) have been knocked back, as has *Erica cinerea* (Bell Heather). This may benefit some of the more specialist flora. On limestone rocks at Ogof fynnon ddu there were good quantities of *Genista pilosa* (Hairy Greenweed) in June and July. *Antennaria dioica* (Mountain Everlasting) is also having a good year here, as it has done on Anglesey at Cors Goch, where a healthy population of about 30 plants contrasted with a handful in previous years.

Scarce clovers such as *Trifolium scabrum* (Rough Clover) came through thin soils where much of the vegetation had been burnt off, and *Ononis reclinata* (Small rest-harrow) is surviving at Overton, although somewhat crisped. If these rock-loving species have managed to set seed, they may be able to take advantage of reduced competition next year.

On Snowdon, above the Miner's Track, *Lycopodium clavatum* (Stagshorn Clubmoss) appears to have produced more spore-bearing cones than usual this summer. The hot summer season will probably have as many botanical winners as losers, and among the winners are the many active botanists we have recording the Welsh flora and monitoring scarce plants.

Local Botany groups in Wales go from strength to strength, some having almost weekly and *ad hoc* meetings, while others meet monthly through the late Spring to early Autumn. See the local botany section on the BSBI website for contact details, past meeting reports and programmes for some of them. Highlights include a productive week in May for the Anglesey Flora Group, led by Nigel Brown, which Ian Bonner, no longer living on Anglesey, was able to join. New monad records were made or updated for species such as *Hypochaeris glabra* (Smooth Cat's-ear), *Moenchia erecta*, *Botrychium lunaria* (Moonwort), *Empetrum nigrum* (Crowberry), *Asplenium obovatum* (Lanceolate Spleenwort), *Cephalanthera longifolia* (Narrow-leaved Helleborine). In Carmarthenshire, the Glynhir week of recording was primarily focused on Bramble recording and identification, with help from expert Batologists David Earle and Rob Randall.

The Welsh AGM took place in the middle of August in Aberystwyth. Some outstanding plant habitat is within easy reach of the city, and the long weekend involved three excursions to plant-rich sites. There were also workshops, exhibits, some excellent speakers and a trip to the University herbarium and botanic garden. Friday afternoon included a brief excursion to IBERS fields to look for arable plants such as *Polygonum* species (knotgrasses). Interesting species seen included *Kickxia elatine* (Sharp-leaved Fluellen), spotted by Steve Chambers, and *Lamium hybridum* (Cut-leaved dead-nettle). On the Saturday we took a narrow windy route ultimately into the cloud to Esgair Fraith lead mine. Some excellent ferns and fern allies, including *Equisetum* x *dycei*, were showing well. On the Sunday, senior reserve manager Justin Lyons led a visit to a slack at Ynyslas, where control of the invasive *Crassula helmsii* (New

Left Andy Jones (left) with a group at the excursion to Esgair Fraith at the Welsh AGM at Aberystwyth.
Right *Equisetum* x *dycei*. *Julian Woodman*

Zealand Pygmyweed) seems to be going well. Here, *Baldellia ranunculoide*s (Lesser Water-plantain) and *Hydrocotyle vulgaris* (Marsh Pennywort) were doing well, colonising the previously bare ground, and we saw some *Centunculus minima* (Chaffweed).

John Poland's enjoyable workshop on the Saturday was followed by a short ramble led by John around some of the grounds of the university, looking at some of the more exotic trees.

Andy Jones, the AGM organiser, gave a fascinating and well-researched talk, 'Arrowheads and Weasel's Snout: Arable Weeds as Archaeology in Wales', on Friday evening, addressing the cultural significance of our arable 'weed' heritage. On Saturday evening, Ray Woods provided the star billing, giving an inspirational talk: 'A Plant's Life in a Changing World'. Ray gave us a selection of worrying and important facts from his research and observations over the years and from the research of others.

Lastly, BSBI is now recruiting for a Welsh Officer; see bsbi.org/vacancies for details.

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COUNTRY ROUNDUPS – IRELAND

MARIA LONG

I had to laugh when I re-read my opening line in the last *BSBI News*, 'Greetings from a currently very snowy Ireland!' I can match that by now saying 'Greetings from a currently very warm and dry Ireland'. What a year we are having in terms of extreme weather. It has certainly made the botany challenging at times.

We have had a busy and productive summer here so

Lynda Weekes speaking to attendees at the aquatic plant workshop in Kilkenny. *Maria Long*

far, with emphasis on two main strands: education and training, and gap-filling and recording for *Atlas 2020*.

In terms of the first, we have had a range of exciting and well-attended courses. In mid May, we held two two-day charophyte courses, each lead by two top botanists. Cilian Roden and Nick Stewart worked as an excellent team and provided second-to-none training to almost 20 people during each of the courses. Attendees had access to very many of our charophyte species as fresh specimens, as well as all known species from Britain and Ireland as pressed specimens. Fieldwork also played a part, allowing valuable experience to be gained in terms of where and how to sample, as well as tips on field characters.

The courses were generously funded by the National Parks and Wildlife Service (NPWS), and the top class location on the shores of Lough Owel, in Co. Westmeath, was provided free of charge by Inland Fisheries Ireland (IFI). We are very grateful to both organisations for their support. Visit the new Charophytes webpage to learn more: bsbi.org/charophytes.

We have also continued our very successful programme of joint training events with the National Biodiversity Data Centre (NBDC). This year we re-ran (twice!) a very popular and highly useful one-day course on using *Webb's Irish Flora*. This book is the 'bible' in Ireland, but can be intimidating to beginners. as well as improvers. Under the expert tutoring of Richard McMullen, each course has seen ten to 15 botanists gain invaluable experience and confidence in keying out plants. This is hugely significant to my mind, as frustration with using keys can be a big deterrent for some people.

Here is some feedback from two attendees of the most recent run of the course:

'Fantastic course. I learned loads. Richard and [Paula] were amazing tutors. I'd recommend anyone to do it if it's run again'

'Totally agree. Great tutors and they chose great plant samples to help us get the most out of the keys. And there was good company. Fab day! I would do another one tbh to keep practising. Learned a lot from others around the table too.'

Another joint workshop with the NBDC was held in late July and focused on aquatic plants. Lynda Weekes led this workshop, which was hosted by the Vice-county Recorder Roger Goodwillie in Kilkenny, and she really outdid herself. She developed a most useful key for aquatic plants, and had samples of a huge number of species. There were over 20 people in attendance at this, and all were absolutely delighted with the training received.

In terms of gap-filling and recording for *Atlas 2020*, our field-meetings programme is more full than ever, with 34 days in the core programme alone, and that does not include the Rough Crew (who are tackling a wide range of islands this year) and local group trips! All of these events are targeted at generating records for *Atlas 2020*, and most are located in places where there are few records. We have had a great attendance at all events so far, and are, just this week, looking forward to our biggest event of the year: five days recording in Co. Mayo, including a few days on Clare Island. It is going to be great – so watch this space for photos and feedback next time!

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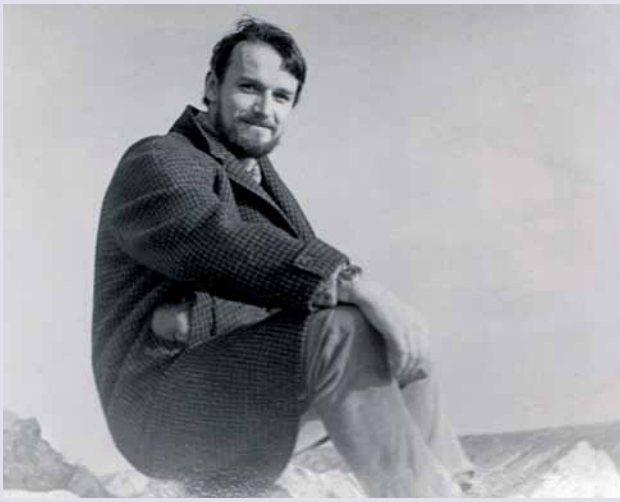
OBITUARIES

QUENTIN OLIVER NEWTON KAY (1939–2017)

Quentin Kay was born in Reading, on 29th March 1939, where he and his three elder brothers, John, Robin and Graham, grew up in an academic atmosphere. His father, Herbert Davenport Kay, was a distinguished biochemist and a Fellow of the Royal Society, while his mother, Beatrice, was a botanist. Both parents had separate and significant influences on him during his formative years, but his early interest in plants was undoubtedly nurtured by his mother who introduced him to the British flora. Among other things, they went on holidays together, cycling from youth hostel to youth hostel and exploring the natural history of the English countryside.

Quentin was educated at Leighton Park, a small, independent Quaker boys' school with a reputation for high pupil entry into Oxford and Cambridge Universities, although the Kay family was not Quaker. The success of Leighton Park then was due largely to the energy, vision and ambition of John Ounsted, its young headmaster. Ounsted was a man of great intellect and a good field botanist, well known in the BSBI, and his infectious enthusiasm for natural history, particularly birds and plants, was an inspiration to Quentin and many other boys who passed through the school at that time. Quentin often spoke fondly of Ounsted and the influence he had on him, not only as a naturalist but also as a committed pacifist. Like his mentor, he was soon able to travel independently and widely in the English countryside and indulge his passion for plants, birds and geology. Robin Kay recalled the time when as a young man Quentin became 'fixed on botany like his mother and went quartering the countryside on his Corgy motorcycle looking for interesting specimens'.

Quentin excelled at school and gained entry to Magdalen College, Oxford, initially to study biochemistry. However, he switched his interest and eventually became an exhibitioner in Botany from 1957 to 1960. While at Oxford he became a supporter of the Campaign for Nuclear Disarmament, undoubtedly influenced by his education at Leighton Park. He also developed a keen interest in archaeology and became an active member of the university's Archaeological Society, fostering an interest in ancient history which stayed with him throughout his life.



Quentin Kay.

He stayed on at Oxford as a postgraduate research student and completed his D.Phil., *Experimental studies of selected weeds*, under the supervision of Stan Woodell. The rather vague title belies a thesis that describes a detailed investigation of the origin, variation and distribution of the mayweeds, *Tripleurospermum inodorum* (Scentless Mayweed) and *T. maritimum* (Sea Mayweed), the main results of which were published later in two separate papers in *Watsonia* (Kay, 1969; 1972). Nearly 40 years on, these accounts remain fresh, clear and relevant to British botany. He became an established authority on the Anthemideae, particularly mayweeds and chamomiles, and was for many years the BSBI referee for these difficult taxa, never underestimating how puzzling they were to recorders. I remember asking him for useful tips for separating the two mayweeds in the field. He replied, mischievously: 'if it's near the sea it's probably *Tripleurospermum maritimum*!'. His three separate accounts of *T. inodorum, Anthemis cotula* (Stinking Chamomile) and *A. arvensis* (Corn Chamomile), which were published in the *Journal of Ecology*'s Biological Flora of the British Isles series (Kay,

1971a, b; 1994a), are the standard points of reference for these species.

After leaving Oxford in 1964 he secured a post as Assistant Lecturer in Botany in the Department of Botany, University of Wales, Swansea, replacing Tony (A.J.E.) Smith who had moved to Bangor. Judy Cassells (née Harrison), who was an undergraduate student in the department at that time, remembers a youthful Quentin arriving in fell boots and shorts, which endeared him immediately to the students who were only a few years his junior. During those early years, he lived in the west of Swansea with his first wife, Hilary, which allowed him easy access to the university and to the flora of Gower which he came to know so well. He seized the opportunity to study the ecology and reproductive biology of *Draba aizoides* (Yellow Whitlowgrass), which in Britain is confined to the south Gower cliffs. Surprisingly, little had been written about this relict population until he and Judy published their account in the *Journal of Ecology* (Kay & Harrison, 1970). However, these were difficult years for him. Tragically, and not long after moving to Swansea, Hilary died as a result of a serious heart condition.

Quentin assumed responsibility for the department's herbarium and took on Smith's undergraduate teaching duties in cryptogamic botany, plant taxonomy and systematics. His practical classes were often ingenious and refreshingly different to the typical lab classes run by his colleagues. Chemotaxonomy usually figured somewhere in his courses, no doubt influenced by his background in biochemistry. But lecturing was not one of Quentin's strong points. He had a rather quiet speaking voice and a distracting habit of walking around energetically while he spoke. However, he had a strong empathy and a genuine rapport with his students who found him approachable and friendly, traits that were not common among university staff in those days. Under his supervision, many undergraduate students completed excellent research projects. Notable among these was the Biological Flora account of *Draba aizoides* he wrote with Judy Harrison and two projects that investigated floral morphology, nectar production and insect interactions in *Silene dioica* (Red Campion), whose results were published in *New Phytologist* (Kay *et al*., 1984).

For many years Quentin organised and ran all the botany field courses at Swansea, many of which were excursions to botanical hotspots in Gower and the Brecon Beacons, but also to various venues in Ireland, Mid Wales, the Isles of Scilly and Spain. He was an outstanding field botanist and, for those who could keep up, a day in the field with him was inspirational. Whether they had been with him on the edge of Lady's Island Lake in County Wexford at 4am to see *Achillea maritima* (Cottonweed) or had paddled down the River Llia to see *Trollius europaeus* (Globeflower), his students left university with indelible memories. He had an unfailing belief that students needed a well-rounded appreciation of the British flora. I well remember one group gasping for air as they followed him up a steep, scree-filled gully in the Brecon Beacons to an outcrop where a tiny, nondescript patch of Purple Saxifrage was clinging to a rock. Pointing to a withered flower he exclaimed '…and here it is, *Saxifraga oppositifolia*, at its southern limit in Britain'. Quentin had an encyclopaedic knowledge of the British Flora and his excursions were punctuated with historical, archaeological and geological detail. He had little faith in illustrated floras, so his classes were weaned on the *Excursion Flora* and when we took students to southern Spain, he insisted that they use *Flora Europaea* to identify their specimens.

Quentin's academic interests were firmly embedded in ecological and population genetics and in his early years at Swansea much of his research concentrated on the weedy species with which he was so familiar. He supervised a steady stream of Ph.D. students on topics that ranged from genetic variation in herbicide resistance in mayweeds to self-incompatibility in *Sinapsis arvensis* (Charlock). Later, he developed a broader interest in the ecology of flowering, particularly in relation to resource costs, insect-flower interactions and pollination. His review article *The comparative ecology of flowering* (Kay, 1987) illustrates the classic, rounded approach he took to population genetics, where morphology, biotic interactions and ecology are all included in the model. He also became interested in the biophysical properties of petals that influence pollinator choice and, using techniques such as ultraviolet photography to study flower colour characteristics, he went on to describe and classify patterns of pigment distribution, light reflection and cell structure in petals in that context (Kay *et al*., 1981).

The British flora was always at the heart of Quentin's interests and in the later years of his

academic career his research concentrated more on genetic variation in natural populations. The catalyst for this was the successful use of isoenzyme analysis to study heterozygosity in *Polygala vulgaris* (Common Milkwort), which he undertook with Andrew Lack (e.g. Lack & Kay, 1988). Soon after this he was approached by the Countryside Council for Wales (now part of Natural Resources Wales) to establish a research programme on the reproductive biology, population genetics and demographic ecology of rare plants in Wales. The investigation, which he carried out with Rosemary John, focused on 32 rare species of threatened lowland habitats in Wales, particularly those endemic to oceanic western Europe, which are endangered or declining, such as *Carum verticillatum* (Whorled Caraway), *Chamaemelum nobile* (Chamomile), *Cirsium dissectum* (Meadow Thistle), *Vicia orobus* (Wood Bitter-vetch) and *Wahlenbergia hederacea* (Ivy-leaved Bellflower). He stressed that species like these, which have recently become rare, are much more seriously threatened than 'old' rare species that have always been rare and whose populations are relatively stable. The reports that describe this investigation and its results (Kay & John 1993; 1994; 1995) are exemplary studies in conservation genetics. He believed, strongly, that if a conservation programme was to have any prospect of success then the population biology, breeding system and patterns of genetic variation of the species involved must be taken into account and should inform and guide the conservation policy in statutory UK agencies.

Clarity of thought, meticulous preparation and a lucid writing style are evident in everything Quentin wrote. Good examples include his account of *The history, ecology and distribution of the flora of Glamorgan*, one of the chapters that prefaces the county flora (Kay, 1994b), the review he wrote with David Stevens on *The frequency, distribution and reproductive biology of dioecious species in the native flora of Britain and Ireland* (Kay & Stevens, 1986), which drew attention to the surprising lack of information available on dioecious taxa in our flora, and a fascinating account of the evolution and ecology of endozoochory in the European flora (Kay, 1992). He maintained that the best way to learn something was to discover it for yourself, so there was never a hint of imitation in his words, just the uncomplicated fluency that comes with understanding.

Quentin became a member of the BSBI in 1964 and was the Recorder for West Glamorgan from 1983 to 2004. He was a meticulous recorder with high standards, which he also expected from those who submitted records to him. In 1969 he began a collaboration with Gwynn Ellis and Arthur Wade to produce a new *Flora of Glamorgan* and in the following 20 years he worked tirelessly on this project. It was during this time that I came to know him as a friend and colleague, accompanying him and Blodwyn, his faithful Labrador, on many fearless car journeys in his red Renault 4 to all corners of the county. There were only a few active field botanists in South Wales in those days and Quentin was responsible for a huge amount of the data published in the *Flora of Glamorgan*, which he co-authored with Gwynn and Arthur in 1994. He made numerous contributions at BSBI meetings, led field meetings and published in *Watsonia*, *BSBI News* and the *BSBI Welsh Bulletin*. He also contributed regularly in meetings of the Ecological Society's Ecological Genetics Group, gave plenary lectures at international meetings and ran the occasional course on bryophytes and lichens for the Department of Adult and Continuing Education at Swansea.

Quentin travelled widely as a botanist but he had a special fondness for the Mediterranean flora. Equipped with a copy of Lieutenant Commander C.T. Stocken's *Andalusian Flowers and Countryside* and one or two carefully chosen volumes of *Flora Europaea*, he made several trail-blazing trips to Spain in the 1970s. There were no useful pocket guides to the Mediterranean in those days, but he got around this with an impressive, almost intuitive grasp of the Mediterranean flora which I witnessed on excursions with him in Spain and Crete. These were not species-ticking trips, but expeditions with purpose driven by curiosity, scientific observation and specimen collections. Much of the data that formed the basis of his work on the ultraviolet reflection patterns of petals was collected on these expeditions.

Quentin took early retirement from academia in 1994, after 30 years of service. He was only 55, but I think he had had enough of the stressful, academic rat race which had become normalised in modern, university life. Furthermore, he had become actively involved in the project to establish a National Botanic Garden of Wales at Llanarthne, Carmarthenshire, and retirement allowed him to spend more time on this. He was an influential member of the original steering

committee that established the Garden and his expertise inspired and guided the instigation and development of the 'Conserving Welsh Plants and Habitats' project. His time in retirement also allowed him to record and map the flora of Gower on a detailed scale, with a view to producing a definitive flora of the region.

For most of his life Quentin lived in a Gower cottage in Cwm Ivy, near Whiteford National Nature Reserve. He was an obsessive collector of second-hand books, particularly local floras, and the shelves in his cottage were stacked with volumes that would have provided most BSBI members with hours of browsing entertainment, with a complementary glass of homemade elderflower wine in hand and a Haydn quartet playing from a gramophone in the background. His garden was a botanical wonderland, complete with an eclectic assortment of plants that he had collected on overseas trips, fruit trees that always seemed to produce too much fruit, various experimental plots and Swallows that returned to the outbuildings every year.

Quentin Kay belonged to that post-war school of academic botanists who lived through a golden age of British botany and who enriched the BSBI with knowledge and understanding, which they shared freely. He was a gentle, calm, rather shy man, but courageous in his beliefs and full of confidence in what he knew. Always modest, he had an extraordinary intellect and was good at everything he put his mind to. In order to construct distribution maps on his old Amstrad word processor, he learned a variant of the computer language BASIC, and reprogrammed the computer. Once I found him installing new windows to the front of his cottage, all the more impressive when I discovered that he had made the windows himself. He also fitted his own kitchen, did the plumbing and made the gates. He was an accomplished scuba diver who kept detailed records of all his dives. He was an excellent photographer, he enjoyed sport, played a bit of golf and he was a big fan of the Simpsons. He was fascinated by maps and his navigational skills were uncanny. I never heard him speak ill of anybody.

Quentin shared the last 30 years of his life with his wife Eileen, who survives him and whom he adored. He had no children of his own but he had a close, kindred relationship with Eileen's son, Nick.

Quentin died on 18th December 2017, after a long illness. He leaves a great vacuum in Welsh botany.

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Charles R. Hipkin

WALTER SCOTT MBE (1940–2018)

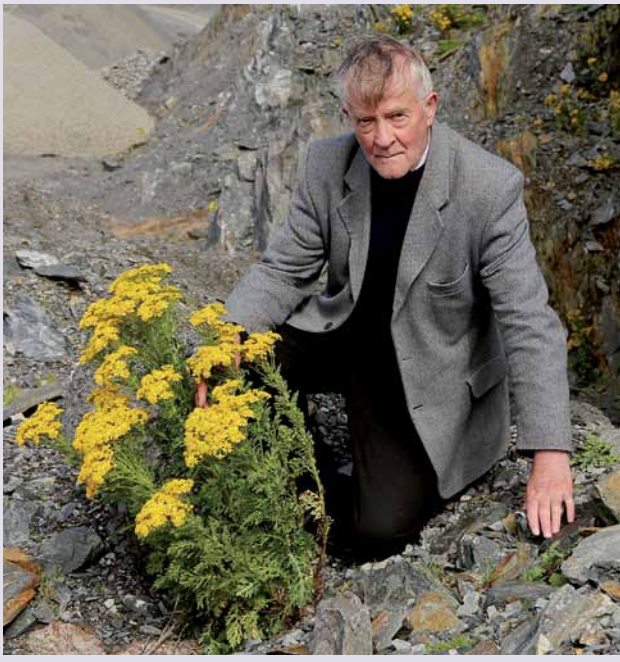
Walter Scott was born on 3rd March 1940 at Easterhoull, a small crofthouse overlooking Scalloway Harbour in his beloved Shetland. His family made frequent trips to his mother's parents' croft at South Nesting, where Walter and his young cousin, Jean, would seek out as many different flowers as they could find. His neighbour, the scholar E. S. Reid Tait, gave him a little book about the subject and Walter began to collect plants, pressing them in an old family encyclopaedia. A more formal interest in botany began in 1955. That year Walter observed his first hawkweed – a group that would come to hold a special fascination for him that would last the rest of his life, and he joined the BSBI. Just six years later he became its V.C. Recorder for Shetland, a post which he retained until 2015.

One day in September 1955, the son of the proprietor of the Scalloway Hotel told Walter that they had a resident who had arrived in Shetland to study wild plants and suggested that Walter meet him. So began a friendship with Richard Palmer that would endure for a lifetime. Walter wrote later 'That evening we met; he was 20 and I was 16…..The first meeting included a walk around the outskirts of Scalloway during which Richard showed me several plants new to me. I think he was a trifle surprised to find someone little more than a schoolboy and living in the village he had chosen for his holiday, who was as passionate about plants as he was and with no fear of Latin names. He was shy, so was I, but we became good friends.' (Palmer 2006).

Richard was to return to Shetland many times and in the summer of 1958 Walter and he decided to write a flora for Shetland. By now Walter had left his job in a lemonade factory and moved to Hay & Co. in Scalloway, a general ironmongers selling hardware and ship chandlery. The new hours allowed him more time for botanising, and reading and fieldwork for the flora began in earnest. Although Walter never learnt to drive, close friends took him to various parts of the islands; he also became a familiar figure on Shetland's buses. He visited 348 of Shetland's 350 island holms (islands in Shetland's freshwater lochs) and all the offshore islands and stacks with any vegetation upon them. Walter and his friend Arnold Duncan must be two of very few Shetlanders to have set foot on the precipitous Muckle Ossa, an island off Esha Ness thought to be a remnant volcanic plug. In 1970 they sailed out from Hamnavoe on the *M B Mayflower* with a small boat and lifebelts; 20 minutes on the isle was enough to reveal that there wasn't 'the least bit of vegetation' there.

Walter left Hay & Co. shortly after they shut their Scalloway operation down and got a job with Alex Fraser, fish processor and shipping agent, where he became renowned for the same meticulous, painstaking approach he applied to his botanical studies, and enhanced his interest in boats.

In 1969 Scott & Palmer published a small booklet, *A Check-list of the Flowering Plants and Ferns of the Shetland Islands* as a precursor to the main flora. It proved popular, with all 500 copies sold in less than two years.



Walter Scott. *Jim Nicolson*

This list was the most complete record of Shetland's plants at this time. Walter commenced the manuscript for the new flora in 1976 and began the typescript in 1981 using a Remington 'Fleetwing' typewriter that had been purchased specifically for the job in 1965! With grant-aid assistance from the Shetland Amenity Trust, *The Flowering Plants and Ferns of the Shetland Islands* was finally published by the Shetland Times in December 1987. All 1,200 copies sold out within a year of publication.

It is instructive to look at the list of acknowledgements at the front of this book. As well as expressing gratitude to many academics, the authors also thanked the 'numerous local people (crofters, farmers, boatmen, bus drivers, taxi operators, boarding-house keepers)'. Chrissie Williamson, in whose comfortable home the two authors spent many an evening discussing botany and their plans for a flora, received special mention.

Walter's botanical studies didn't stop after publication of the flora – he was subsequently lead author on *Rare Plants in Shetland*, published by Shetland Amenity Trust in 2002, and then self-published *Some aspects of the botany of the Shetland Islands* in 2011. The latter comprises an updated annotated species list, a dichotomous key to the 27 species of *Hieracium* in Shetland, scanned images of all of Shetland's 22 endemic Asteraceae and a comprehensive bibliography of the Shetland flora.

Walter's last major botanical work was fitting, given his passion for hawkweeds. With Tim Rich, he wrote BSBI Handbook No. 15, *British Northern Hawkweeds: A monograph of British* Hieracium *section* Alpestria. Walter, along with Richard Palmer, had described three new species of hawkweed for science while another, *Hieracium scottii* P. D. Sell, was named after him for his large contribution to the flora of Shetland. Walter also managed to establish a few individuals of all Shetland's endemic hawkweeds, along with other plants rare in a Shetland context, in specially constructed wooden frames at his home in Scalloway. As well as enabling him to study the plants more closely, his foresight ensured that one species, *H. hethlandiae*, did not become extinct when its only known site disappeared as part of road construction. These plants were critical in Shetland Amenity Trust's successful efforts to establish populations of between 25 and 50 adults of each hawkweed species at their horticultural unit in Lerwick, some of which have been returned to the wild. In 1996 Walter was 'pleased, embarrassed and surprised' to get an MBE for his conservation efforts.

Walter's love of Shetland's hawkweeds was in part due to the attractive surroundings that they grow in: rocky cliffs, ravines, island holms and hay meadows all share a luxurious and diverse flora, being the only areas in Shetland that are not subject to sheep grazing. Walter witnessed firsthand how the impact of development and the intensification of agriculture reduced the diversity and abundance of Shetland's flora. In recent years he became frustrated with the conservation bodies and BSBI, which he felt spent far too much time recording and far too little actively conserving.

During the last few years, Walter had carefully prepared his botanical archives for transmission to the Shetland Archives. He once took me aside to show me how all the manuscripts, letters, records, etc., were cross-referenced; the ease with which any historical record and related correspondence could be traced was truly staggering. He also turned his attention to other projects, more details of which can be found on his website, Shetland by Numbers www.shetlandbynumbers.com. Among them, he managed to visit every ruined croft house – all 2,467 of them, 2,238 out of 2,248 1km squares, all 527 freshwater lochs and 115 hill summits above 150m.

Walter was a shy man who felt distinctly uncomfortable in groups, yet all those who were lucky enough to meet him were greeted with courtesy and kindness, and his enthusiasm and scholarly approach were abundantly clear. Once a rapport had been established, Walter's quick wit and sense of humour were very entertaining. His sudden death on 23rd February 2018 came as a great to shock to friends in Shetland and beyond, and has left a huge void in botanical recording in the islands. Walter always described himself as a 'local boy who never went on to further education', which makes his contribution to botany all the more remarkable. As Shetland archivist Brian Smith observed – Walter was Shetland's greatest self-taught scholar.

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Paul Harvey

OBITUARY NOTES

I must apologise for the omission of the full names of two of the subjects of the obituaries in *BSBI News* no. 138 (April 2018), Eric Richard Meek and Michael Charles Faraday Proctor. Neither Andrew Branson nor I remember reducing their names, leading to the inescapable conclusion that gremlins were responsible.

Since the publication of the last issue, we regret to have to report the death of the following members, some of extremely long standing. We send our sympathy to all their families and friends. An obituary of Walter Scott is included in this issue and we hope to publish obituaries of Charles Gimingham and Rob Wilson in the future.

Mr K.A. Beckett, a member from 1958 to 2014, Vice-county Recorder for West Norfolk jointly with his wife Gillian from 1988 to 2010 (see the obituary of Gillian in *BSBI Yearbook 2017*: 78–80), as well as a prolific writer on horticultural subjects.

Mrs P.F. Braithwaite of Hawick, Roxburghshire, a member for 46 years. Paddy was a familiar figure at the Society's meetings, especially in Scotland, and the wife of Michael Braithwaite, former President and Treasurer.

Mrs A.A. Butcher of Worthing, West Sussex, a member for 42 years.

Mr O.T. Cairns of Devizes, Wiltshire, a member for 37 years.

Mr & Mrs T.H. Fowler of Chalfont St Giles, Buckinghamshire, members for 28 and 27 years respectively.

Mr P.H. Gay of Canterbury, Kent, a member for 44 years.

Prof. C.H. Gimingham of Aberdeen, a member for 66 years.

Mr M.G. McFarlane of Heathfield, Sussex, a member for 64 years.

Mr W. Scott MBE of Scalloway, Shetland, a member for 63 years (obituary in this issue).

Dr R.M. Veall of Romsey, Hampshire, a member between 1982 and 2017 and Recorder for Sark from 1996 to 2014.

Mr R. J. Wilson of Rothwell, Northamptonshire, a member for 30 years and Vice-county Recorder for Northamptonshire.

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assisted by the Membership Secretary, Gwynn Ellis

CURATION AND CONSERVATION OF PHOTOGRAPHS

Some time ago the modest world of railway enthusiasts became worried that collections of old photographs were being lost as their owners died or lost their interest. The same is at risk of happening to many botanical images taken over the years. The collection of a prodigious and published botanist I knew is probably lost; I certainly don't know of its whereabouts. Oleg Polunin left his slides to his old school, but so far as I can tell they are not easily accessible. Similarly, a huge, undreamed of, number of images are being created now with the advent of digital cameras, which simplify a lot of the technical aspects of photographing small objects such as the details of plants.

All of this material seems doomed to die with its originators. It is not difficult, however, to digitise old film images, and images in digital form are easy to review, edit, and store securely. It does, however, need labour and expertise and the tacit support of an organisation that would give it intellectual respectability. With this we could create a collection of images that is botanically and technically good, as well as aesthetically pleasing. Would many of us join in such a project? We cannot save everything, but finding and preserving the best is manageable.

If you are interested in being involved in this project, please contact me.

Andrew Skinner
photoflora2018@eiderduck.co.uk

REVIEWS

The Orchid Hunter

A young botanist's search for happiness

Leif Bersweden
Short Books, 2017
364pp. £12.99 hbk; £8.99 pbk
ISBN 978-1780-72334-1 hbk;
ISBN 978-1780-72352-5 pbk

The first thing to say about *The Orchid Hunter* is that the hunter was only 18 years old. He devoted his gap year, before going to Oxford to study natural sciences, to finding all the wild British orchids, 52 species in all. It is quite something for a man still in his teens to have the will to spend all summer plant-hunting, and then to write it up in 364 pages and find a publisher. Short Books could be criticised for over-filling the page, and for some rather wishy-washy colour plates. Also, perhaps, for not persuading the inexperienced author to trim the fat and write a slimmer book. But, having tried to see all the orchids during my own gap year, long ago, and failing miserably, I have nothing but admiration for Leif Bersweden's achievement.

The second thing to say is that he is lucky. It took a bit of luck, coupled with good research, to find all the orchids bar one: the Ghost Orchid would defeat anybody since it has flowered only once in 30 years. He wasn't helped by the weather; 2013 was a late year, with a lot of summer rain, and orchids were even less predictable than usual. He was lucky, too, in publishing the book ahead of a similar orchid quest published by Bloomsbury in April. I should also, in all modesty, mention that my own plant-hunting book, was published earlier this year. Three different plant-quests, all published at about the same time, is an extraordinary coincidence.

The Orchid Hunter is a botanical road trip beginning in Dorset in April with an encounter with the Early Spider, and ending five months later in almost the same place with 'spirals by the sea', the Autumn Lady's-tresses. In between he manages to get to the west coast of Ireland *three times*, as well as a trip to Jersey to see the Loose-flowered Orchid. His rattletrap car broke down on the way to the Coral-root. Long distance orchid-hunting is lonely work. He longs for a friendly, attractive girl to share the passion. He nearly finds one.

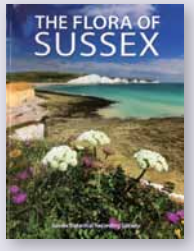
The style is eager, anecdotal, detailed in its topography, with many digressions on orchid heroes such as Jocelyn Brooke, Francis Rose and, of course, Charles Darwin, and short lessons in plant ecology and pollination. Species are sometimes given personalities such as the Lesser Twayblade, 'the court jesters of the orchid world. They seemed to congregate in groups and I imagined them telling stories, jokes and tales of mischief.' He gives you a good sense of 'being there'.

Leif Bersweden is a natural communicator, an enthusiast keen to share what he knows and learns, and what he finds. He has had a thing about British orchids since spotting a Bee Orchid at the age of seven.

He and his publisher believe that he is the first person to have seen all bar one of the orchids in a single season. If so, one can see why. Orchids have the bad habit of all flowering at once and at opposite ends of the country. When I hit the plant trail three years ago, I found the travel involved inexpressively wearisome, but Leif seems to take it in his stride. He has the energy and optimism of youth. All the same, some orchids have become quite tricky. The Dense-flowered Orchid seems harder to find in its Burren heartland than before. Ditto the Fen Orchid in South Wales, while to find the Red Helleborine in flower you need to have a polite word with its wardens. To find the Lady's Slipper, on the other hand, all you need to do is go to Gait Barrows and follow the sign saying 'Slipper this way', and then wait in the queue.

Among experienced botanists there is a kind of inverse snobbery about orchids: 'orch-yawns'. But they are undeniably fascinating and glamorous, and a good entry point to a lifelong love of wild plants. There is nothing yawn-enforcing about this book: it is earnest, modest, observant, engaged and engaging, sometimes funny, and imbued with the spirit of the hunt. Leif Bersweden is currently studying for a doctorate on that majestic trio, the Lady, Monkey and Soldier Orchids. His obsession has a while to run yet.

Peter Marren



The Flora of Sussex

Sussex Botanical Recording Society
Pisces Publications, 2018
428 pp. £45 hbk
ISBN 978-1-87435-781-0

When I was invited to review this book I thought long and hard – Sussex is over 250 miles from my home in North Wales. However, I have, in the past, enjoyed botanising in the Weald and on the South Downs, and the book looked far too attractive to ignore. When I saw the name of Francis Rose and the photo of Mary Briggs, there was no turning back. I well remember being taught with amazing enthusiasm in the field by Francis Rose, and I received many kindnesses from Mary during my early days as a Recorder for the BSBI, and even reviewed her *Guinness Book of Wild Flowers*.

The work was done by the Sussex Botanical Society, which first met in 2004, and the book was published 14 years later – good going by county flora standards. This is a tribute to the organisation and hard work of the team, and also reflects the very large number of active botanists in the county. At the end of the book we have a list of the 'recorders and determiners' involved in the work – I counted about 120.

The authors have experienced the usual difficulties caused by changes to county boundaries over the years. This Flora covers vice-counties 13 (West Sussex) and 14 (East Sussex), as well as small portions of Kent, Surrey and Hampshire, which are in their respective vice-counties, but which are also in the present administrative county of Sussex. The plants are recorded on a 'tetrad' basis, of which there are 1,053. The highest number of taxa recorded in a single tetrad was an amazing 818. Virtually all species growing 'in the wild' have been included, and the scientific and English names follow the third. edition of Stace (2010).

I was impressed by the in-depth account of the history of botanical study in the county, from the early pioneers, such as William Turner, John Gerard and Thomas Johnson, to the work of Mary Briggs, Alan Knapp and the Sussex Botanical Recording Society in our day. There are detailed accounts of the geology and soils; land management is considered, with particular attention to agriculture and the wetlands of the county; and there is a section on the conservation of the flora, with a special word of praise for the Sussex Biodiversity Record Centre. There is a useful analysis of the changes that have taken place, both in species and habitats, since the publication of the *Sussex Plant Atlas*, some 40 years ago.

I must make special mention of the section entitled 'The Habitats and Vegetation of Sussex', which was originally written by Francis Rose, and has been edited and updated by David Streeter. This is an extensive and detailed account, covering The South Downs, The Weald, The Upper Greensand, Ashdown Forest and Amberley Wild Brooks. We read that the Weald of south-east England is the most heavily wooded part of the country, with 19.8% of Sussex under trees, and that well over half is classified as 'ancient woodland'. Sussex is also famous for its heaths, both wet and dry, and their development, vegetation and ecology receive a fascinating treatment.

Most of the *Flora* is devoted to the species accounts, with their accompanying distribution maps. These give the basic information about status and habitats, and many give us an interesting insight into the ecology of the plants and their history in Sussex. Dot maps show the distribution of the species by tetrads, except for those which are 'very rare, or virtually ubiquitous, or of which the occurrence appears to be entirely random'. This is a subjective choice; some readers might wish to see the distribution of all the species. For selected species the dot maps show some of the geological features as well. This can be very helpful. Unfortunately, one has to refer back to page 15 to find the key to the colours of these maps, and there are seven different shades of green used to denote different bedrock formations, which can be difficult. There are many very good photographs in the book – both plant portraits and habitat shots, for example, the rare *Adonis annua* (Pheasant's-eye).

This is an impressive book, which fully maintains the tradition of modern, large-format county floras. It is a large book (13"x10");

the maps and illustrations are well printed and the text, which is laid out at two columns to the page, is easy to read. *The Flora of Sussex* is highly informative, attractive to the eye and very readable, and the ten editors can feel proud of their achievement.

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Flora of Great Britain and Ireland

Volume 1. Lycopodiaceae – Salicaceae

P. Sell & G. Murrell
Cambridge University Press, 2018
lxii + 787pp. £125 hbk
ISBN 978-0-521-55335-3

BSBI members can receive 20% off all five volumes of the *Flora*. When ordering go to www.cambridge.org/flora and enter FLORA at the checkout.

This is the final volume of a five-volume set and covers ferns and allies, conifers and 44 families of Magnoliophyta (from Magnoliaceae to Salicaceae). The classification for families follows that of Cronquist (1981) and is based on morphology, not on molecules, so Chenopodiaceae and Tiliaceae are treated as families distinct from Amaranthaceae and Malvaceae respectively. Lower taxonomic ranks (mainly genera) are treated in very different ways. Based on recent molecular studies, rather unfamiliar genera such as Acetosa, Acetosella or Amblygonon (Polygonaceae) are accepted and *Lavatera* is included in *Malva*. *Chenopodium*, by contrast, is conservatively treated as a catch-all genus, although molecular data strongly support its segregation.

As in previous volumes, apomictic genera are dealt with in an extraordinary, unprecedented way. This applies, for instance, to the *Ranunculus auricomus* complex (with 58 species) and the genus *Limonium* with 52 species, many of them very narrow endemics or newly described. For critical genera like *Polygonum s.s.*, several new species are described, based on habit rather than on floral characters. Likewise, a very narrow species concept has been adopted in the *Chenopodium album* aggregate, where many of Murr's old names are recovered (all with helpful line drawings of leaves). *Ulmus*, with not less than 62 accepted species in the area under study, is another example of a genus that has been thoroughly re-examined, in close collaboration with J.V. Armstrong. Also, *Hypericum perforatum* appears to include four different species rather than a single variable one.

As before, numerous infraspecific taxa are recognized and keyed out, for instance in *Fumaria* (*F. muralis* is divided in three subspecies and six varieties) or *Viola* (especially in section Melanium). *Viola tricolor*, for instance, has four subspecies and not less than 15 varieties (*V. arvensis* has ten varieties). The author's taxonomic viewpoint in this respect often considerably deviates from that of Stace and other contemporary flora writers. However, the authors apparently did not skate on thin ice and always decided after very careful examination. As in previous volumes, in addition to native and naturalised taxa, numerous rare aliens are also included, as are taxa that are widely (or sometimes only locally) grown as ornamentals. Some accounts are therefore extremely helpful, for instance, that of *Betula* that includes 23 species (all of them with illustrations of leaves).

The first author died in 2013 so this volume (as well as volume 2) was edited and fine-tuned by A.O. Chater, R.G. Ellis, P.H. Oswald and C.D. Preston. In general, the manuscript was constantly kept up-to-date in the course of the (long) writing and editing process. New, recently described taxa such as *Dryopteris lacunosa* (2011) and *Salix euxina* (*S. fragilis* auct.) (2009) are included. In this context, it is odd to see that the authors refer on several occasions to 'Czechoslovakia' or 'Yugoslavia', countries that no longer exist.

From the viewpoint of a botanist from the Continent, it is surprising to notice that some taxa are missing, albeit probably correctly so. For instance, *Equisetum hyemale* ssp. *affine*, a robust exotic vicariant of the native ssp. *hyemale*, is much grown as an ornamental these days and has become a local invasive weed in parts of western Europe. It may have been overlooked in the wild in the area under study. Also, a much-grown

and regularly escaped variant of *Malva sylvestris* (var. *mauritiana*) is lacking.

It is clear that Sell & Murrell's *Flora of Great Britain and Ireland* is a masterpiece, nothing less than a life's work (or, in the words of the first author in the preface: 'My life has been almost a hundred per cent devoted to the flora…'). It will probably stand for many decades and is the main reference for anyone studying apomictic taxa. Also, it is an excellent back-up for those willing to go beyond species level into subspecies, varieties and forms. It is, for obvious reasons, impossible to replace Stace's more practical field flora. However, it is an invaluable and very helpful companion to it and should be in the library of every serious botanist, whether professional or amateur.

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Professor Daniel Oliver

Botanist, Artist and Quaker

Stephen Oliver
Privately published, 2016
32 pp. pbk
ISBN 978-1-36-621672-4

In Great Britain, each generation of serious young botanists buys the best available Flora of the country and usually also the county in which they live. At the suggestion of Mr. A.E. Wade at the National Museum of Wales, I went out at the age of 15 and bought a second-hand copy of the two volumes of Bentham & Hooker, along with the illustrations volume. At the same time, Mr. H.A. Hyde, the Keeper of the Herbarium, suggested that if I ever saw a copy of the *Illustrations of the Natural Orders of the Vegetable Kingdom* by Professor Daniel Oliver, I might purchase that as well, as it was so valuable to understand the structure of flowers. Luckily, very soon I was the proud possessor of this volume. To this day, they have been faithful companions, although a train of modern Floras has followed them onto my bookshelves.

Stephen Oliver, a great-grandson of this hard-working taxonomist, has brought together what little there is to give us a very caring and proud image of a man who was a key member of a very small team that set Kew's Herbarium on the road to international greatness. In a short section on his boyhood and Quaker background, one sees a keen self-taught amateur being encouraged by academics in and around Newcastle upon Tyne. In 1847, he joined the Botanical Society of London, a fore-runner of the BSBI.

Born in 1830, he began his professional career as a lecturer at the Newcastle Medical School, but was soon 'picked up' by W.D. Hooker, Director at Kew, to join the herbarium staff in 1858 at the age of 28. He was appointed Keeper in 1864, retiring in 1890. He was a very productive 'naming machine' dealing with the piles of material arriving from all over the Empire, whilst coping with many wide-ranging questions from correspondents from all over the world. The author particularly identifies the letters with Charles Darwin, who constantly sent requests for information and material to Oliver, as the Darwin Correspondence Project shows. Oliver's lecturing experience was also put to good use as he volunteered to teach the young gardeners at Kew, which led eventually to him successfully applying to become Quain Professor of Botany at University College, London, in 1860. To fit this in with his poorly paid role on the Herbarium staff, he had to start his lectures at 8am!

A hidden side of Oliver, certainly to me, was his very strong artistic talents, recognised and appreciated by John Ruskin, who became a friend. Sadly, most of his works have disappeared, as he was apparently very productive both in watercolour and, in later life, in oils. Luckily there are still some examples of his work at Kew, and so it has been possible to include some delightful examples throughout the book. He brought all his talents together when he sought to turn W.H. Fitch's wall posters into a volume that was a guide for students in his *Illustrations of the Natural Orders* in 1874, which is still relevant more than a century later.

I hope this fine booklet may yet become available to a wide audience, as it is a fine memorial volume to a great, hardworking botanist of the past.

Gren Lucas
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NOTES

FROM THE MEMBERSHIP SECRETARY

Please take note of the following do's and don'ts

Address changes When sending change of address details remember to give your membership number or your old address, especially, postcode, and include your new phone number if you are content to have it on file.

Cheques *NEVER* make a cheque payable to R.G. Ellis. Always assume it should be made payable to BSBI or Botanical Society of Britain and Ireland, unless clearly stated otherwise.

PayPal Do not send PayPal payments to the personal account of Gwynn Ellis; always use the buttons on the BSBI website.

Pre-publication offers Please do not combine payments for different offers (including subscriptions) on one cheque. It makes accounting that little bit more difficult.

Eyebrights of Britain and Ireland All copies ordered through the pre-publication offer were sent out in June. If you have still not received a copy, contact the Membership Secretary.

Field key to winter twigs – Publication was due in September 2018 (check website for confirmation). If you have not received your copy by the end of October, contact the Membership Secretary.

The discovery of the native flora of Britain & Ireland A very few copies of this superb book are still available at the discount price of £18, incl. P&P, for UK & Ireland or £22 elsewhere, from the Membership Secretary or the BSBI Website (https://bsbi.org/members)

Gwynn Ellis
BSBI Membership Secretary
gwynn.ellis@bsbi.org

BSBI IS SEEKING TO FILL TWO VOLUNTARY ROLES

Treasurer

As members can see in the *Annual Review* circulated with this edition of *BSBI News*, BSBI is taking great strides towards its aim of achieving financial stability and securing sustainable funding. To help fully achieve this, BSBI is seeking to appoint a Treasurer, who will join the Board.

Whilst the fully qualified Finance Manager will continue to carry out the day-to-day financial tasks required to keep the Society functioning, the Treasurer will provide support and advice where appropriate and will report on financial matters to the Board and membership.

Company Secretary

BSBI is seeking to appoint a voluntary Company Secretary to help it comply with various statutory and administrative duties. This includes returns to statutory agencies and producing Board and AGM agendas and minutes. This vacancy has arisen as the current post holder wishes to retire.

Further details on both these roles can be found at bsbi.org/vacancies or can be posted as hard copy if this is requested.

If you, or someone you know of, might be interested in either of these positions, please get in touch with either: Jane Houldsworth (Head of Operations – jane.houldsworth@bsbi.org, 07584 250 070) or Ian Denholm (Chair of the Board – i.denholm@herts.ac.uk).

PANEL OF VICE-COUNTY RECORDERS

I am very sad to report the death of Rob Wilson, VCR for Northamptonshire since 2004, and co-author of two county Floras. An obituary will be published in the next *BSBI News*, but I wanted to say here how much Rob will be missed, and what a pleasure it was to be with him in the field. Alyson Freeman and Brian Laney, who are both very well versed with the county's flora, have volunteered to take over from Rob as co-Recorders. Alyson can be contacted at alysonfreeman0@gmail.com, and Brian at brianlaney@gmail.com. Many thanks to both for their help and enthusiasm.

East Gloucestershire has a new VCR, Chris Dixon, four years after the 'retirement' of Clare and Mark Kitchen (although they are as busy as ever and generously continue to provide their records to the BSBI). Chris's name may ring a bell as author of the recent *A Guide to Britain's Rarest Plants*. Many thanks to Chris for stepping into the role, and please do get in touch with him if you wish to get involved in surveying within the county. Chris's email address is

stemonitis@gmail.com. For those who wish to contact Clive Lovatt, VCR for West Gloucestershire, via his postal address, be aware that he is now at 32 London Road, Stroud GL5 2AJ.

In North-east Yorkshire, David Barlow has joined Vincent Jones as co-Recorder, following the retirement of Jill Magee. We send our best wishes and thanks to Jill for all her help and hard work as co-Recorder over the past five years. David becomes the first point of contact for the county and can be reached at davebarlo@gmail.com. Matt Berry and Nick Sturt are holding the fort admirably in Sussex, but the vacancy for a Recorder in both the East and West of the county is still open, so please do get in touch with me if you wish to learn more about what is involved. Finally, for England, John Durkin (County Durham) has a new email address: johndurkin@mail.com.

After being sole Recorder for 41 years in North Aberdeenshire and 25 years in Kincardineshire, David Welch now has a co-Recorder, David Elston, to share the joys of north-east Scotland. In Stirling, Matt Harding has become co-Recorder alongside Phil Sansum. Thanks to David and Matt for volunteering their time and expertise.

There remain vacancies for six vice-counties: **East/West Sussex**; **Berwickshire**; **Co. Longford**; **Co. Leitrim**; **Co. Louth**.

Pete Stroh
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VOLUNTEERS REQUIRED FOR EDITING *ONLINE ATLAS* CAPTIONS

The species captions written for the ***New Atlas*** (Preston ***et al***. 2002) have been an invaluable source of information for nearly 20 years, and with the publication of a new ***Online Atlas*** on the horizon, we now require your help to bring many of these captions up-to-date. If you are interested in helping, please contact either one of us, and we will outline what is required, and by when. We plan to start this major piece of work this autumn, and look forward to hearing from members of the Society.

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BSBI PHOTOGRAPHY COMPETITION

If you are a keen photographer and are planning to enter this year's BSBI Photographic Competition, remember to send your entries to Natalie Harmsworth (natann29@freeuk.com) by **19th October 2018**. Full details of the competition appeared in *BSBI News* 137 and are online at https://bsbi.org/bsbi-photographic-competition. To recap briefly, the 2018 competition has two categories: 1) Plants and People and 2) Plants and Pollinators. There is, however, a limit of two images per category per entrant. Winners will be selected by a popular vote by those attending the Scottish Botanists' Conference (the Scottish Annual Meeting).

Good luck!

Jim McIntosh, BSBI Scottish Officer
jim.mcintosh@bsbi.org

BSBI DIARY 2018–19

A reminder that this year's BSBI Recorders' Conference takes place in Shrewsbury on 12th–14th October; you can find out more and make a booking at bsbi.org/recorders-conference. This year's BSBI Annual Exhibition Meeting and AGM will be held at Edge Hill University, Lancs. on 17th November, details here: bsbi.org/annual-exhibition-meeting and on the flyer inside this issue of *BSBI News*. The dates for the 2019 New Year Plant Hunt will be announced on 1st December at: bsbi.org/new-year-plant-hunt.

BRITISH & IRISH BOTANY

The new website for *British & Irish Botany*, the successor to *New Journal of Botany*, is now live: www.britishandirishbotany.org. Ian Denholm, Editor-in-Chief, is keen to receive your contributions or hear your suggestions for papers or notes on any aspect of botany in Britain and Ireland (see *BSBI News* 138, p.78).

Louise Marsh, BSBI Communications Officer and B&IB Editorial Assistant
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bib@bsbi.org

A NEW WAY TO PAY BSBI MEMBERSHIP ENTER OUR COMPETITION

Enter our competition to win one of two prizes worth £100/€125 by starting to pay your annual BSBI membership by Direct Debit and, *new for BSBI members in Ireland and other Euro-zone countries*, by SEPA in Euros.

Choosing to pay your annual BSBI membership subscription by Direct Debit is quick and easy for you and is very cost effective for BSBI. We're delighted that so many of you – almost two-thirds of our membership – have already chosen to pay in this way.

We think that all of you who live in Ireland and other Euro-zone countries will now be delighted to learn that you can soon have the same convenience and peace of mind as UK members by paying in a similar way: by SEPA in Euros.

SEPA is a new Euro-zone system which we've been implementing in BSBI over the summer months and we'll tell you more about it on BSBI's website as soon as it is up and running.

To celebrate this exciting new development and encourage even more members to pay in one of these two ways, we are running a competition with two fabulous prizes to be won: €125 for new SEPA applicants and £100 for new Direct Debit applicants.

Winners can choose from the following:

- Books and more at: www.summerfieldbooks.com/ or
- Payment towards a special interest activity at: www.naturetrek.co.uk/ or
- RHS Gift vouchers at: www.rhs.org.uk/shop/vouchers

To make sure you have a chance of winning, simply sign up to Direct Debit or SEPA to reach us before 31st December 2018 and your name will be automatically entered in the competition.

How to sign up to Direct Debit:
Complete the Direct Debit mandate enclosed with this issue of *BSBI News* or go to: bsbi.org/subscriptions

How to sign up to SEPA:
After 15th October 2018 go to: bsbi.org/subscriptions

The winners will be contacted in February 2019 and then (with their permission) announced on our website and in *BSBI News*.

Thank you and good luck.

Julie Etherington, BSBI Finance Manager
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LETTERS

County Floras and topographical maps

The new *Flora of Sussex* has just arrived – beautifully presented, fantastic coverage and really interesting to read. It is many years since I lived anywhere near there, so I looked for a map to refresh my memory of locations. There is one small map, showing the major towns. There is a gazetteer, but surely a decent, full-page map is a prerequisite of a county Flora?

I'm not alone in purchasing a Flora, but living elsewhere, and a map, locating many of the places, would be so useful. We held a Flora Writers conference at Liverpool some years back, and I canvassed many colleagues on their 'ideal flora'. A decent map featured in every list. In the 19th and early 20th centuries most floras had a fold-out map, or a loose one in a pocket. Presumably economics have meant that this is expensive to replicate today, but some – not many – recent Floras have a perfectly adequate map, sometimes as part of the inside cover.

Of the 24 Floras produced since 2010, all but two had a map of sorts (how can you produce a Flora without any topographical map?). Of the remaining 22, nine maps were poor, eight just about muster, three were good and only two were excellent. Of course, there is a question of cost. If you wanted an up-to-date map, I imagine that an Ordnance Survey licence is essential, and chargeable, although anything older than a few years would be free, and it might be possible to use that of, say, the Local Record Centre. But with a total production budget of possibly around £20,000 or more, I venture to say that this is peanuts.

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An achlorophyllous variety of *Epipactis purpurata* (Violet Helleborine), photographed 20th July 2016, near Christmas Common, Oxfordshire, in the v.c.23 part of the Chilterns. The plant was growing in *Fagus–Ilex* (Beech–Holly) woodland on alkaline clay-with-flints, and it really was this colour! I visited it a few days later with Terry Swainbank, and he also took a generous suite of photos. It did not appear in 2017.
Tim Harrison

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