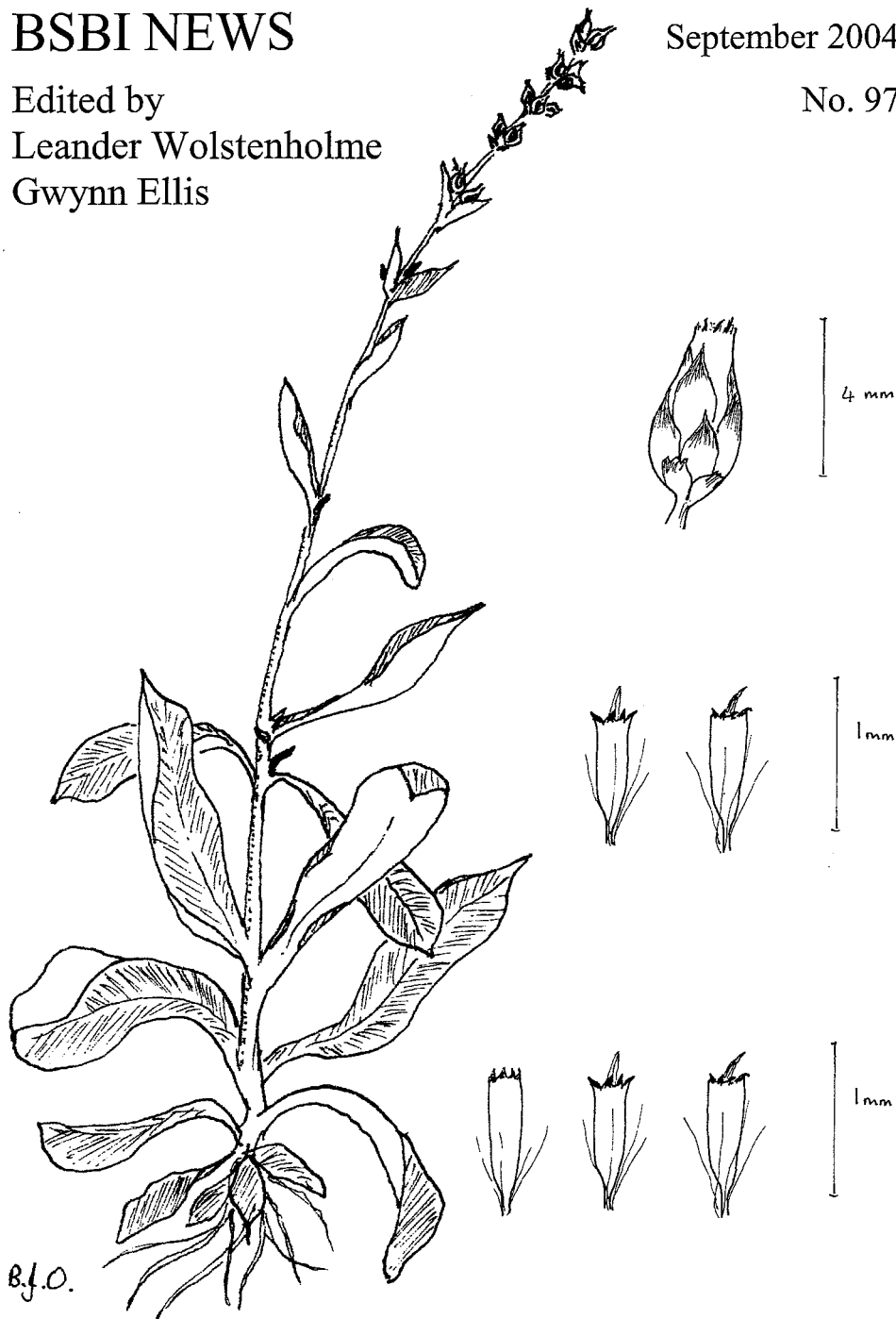


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IMPORTANT NOTICES

FROM THE PRESIDENT

I will leave the reporting of progress on the Society's Development Plan to David Pearman as he has been dealing with it at first hand and updates us in his piece printed below. I would, however, wish to report that the production of County Rare Plant Registers is now advancing apace with the recent publication of another two (Dorset and Co. Down) and more about to come from Wales. I hope that soon every county will embark upon their own local compilation as these are just the sort of documents that the BSBI is well qualified to provide and by which it can make an enormous contribution to the conservation of our wild flora.

Recently I have been lucky enough to be able to survey extensive areas of land in the more urban parts of my own Carmarthenshire, land often unused or post-industrial sites earmarked for redevelopment. It was a revelation to me to discover small 'pockets' of natural habitats – fens, brackish marsh, ponds – as well as secondary, developing habitats – neutral grassland, alder carr, birch woodland – all interposed with derelict buildings, old railway sidings and thickets of Japanese Knotweed and Himalayan Giant Blackberry. But the areas of recently disturbed ground I found to be of greatest interest as they supported a most perplexing number of non-native species which included several new vice-county records and several species which await determination. I suppose that members living in the more urban parts of the country are well used to this situation but having done most of my botanising in a rural county it came as a refreshing, if not completely welcome change. *Agrostemma githago* (Corn-cockle) and *Centaurea cyanus* (Cornflower), presumably persisting from recent introductions, *Datura stramonium* (Thorn-apple), *Hyoscyamus niger* (Henbane), *Lamium amplexicaule* (Henbit Dead-nettle), I assume from long-established soil seed-banks, but where do species such as *Scirpoides holoschoenus* (Round-headed Club-rush) and *Conyza bonariensis* (Argentine Fleabane) originate from? It also seems that on each repeat visit to a site, something new has sprung-up!

Few of these new discoveries were located within any of my ten Local Change tetrads but this is not surprising as only one is in an urban area. What I have been finding though, is that despite thorough searching, often along the 1986-7 routes, about $\frac{1}{4}$ to $\frac{1}{3}$ of species recorded previously have not been re-found and yet we have achieved similar totals in each square overall. Other Recorders to whom I have spoken have reported similar results and all are of the opinion that the plants themselves are dynamic and the subject of constant change resulting in losses and gains from year to year. Jean Green, Recorder for Denbighshire, commented from her own experience that there is a real shift of species with time, a change which we should expect and not be surprised by: even hay-meadows have new/lost species every year. So will the final analysis of the Local Change results reflect this perception? Perhaps there is scope for a future network research project to address this apparent phenomenon.

Kath and I have very much enjoyed visiting and recording at new sites this year, both locally and further afield. Particularly memorable was the recent BSBI Irish AGM based in Fermanagh where we were made particularly welcome and were taken to some outstanding places. I hope that you have all enjoyed this field season and have managed to achieve your own objectives in addition to the completion of the Local Change work! And a particular thank you for all the hard work you have put in so far!

RICHARD PRYCE, PRESIDENT

4 Sept 2004

INTERACTIVE FLORA OF THE BRITISH ISLES

The *Interactive Flora of the British Isles* has been a joint project of the BSBI and ETI (Amsterdam). Thanks to the hard work of our Dutch colleagues it has been completed on time. The final product is a unique electronic publication, presenting a wealth of information on nearly 3800 plant species on a single DVD Rom containing over 3 gigabytes of data.

This magnificent digital encyclopaedia is based on the *New Flora of the British Isles* (CUP) and *New Atlas of the British and Irish Flora* (OUP). It also includes:

- Complete taxonomic inventory: hierarchy, scientific and common names
- Species descriptions
- About 8000 drawings and colour photographs
- Computer guided identification system to families, genera and species
- Interactive geographic information system with searchable distribution information
- Hyperlinked reference and glossary sections

The *Interactive Flora* is now available from Summerfield Books for £32 incl. p&p (see their new catalogue (back page) enclosed with this mailing).

Having used it for two months, it is, in my opinion (RGE) a most significant advance in botanical identification and Flora production and if you have a computer that can read DVDs you just have to get it.

EDITORS

FIRST RECORDS OF BRITISH FLOWERING PLANTS

Jon & Sue Atkins of Summerfield Books have just reprinted a facsimile of the 2nd Edn of W.A. Clarke's book published in 1900, together with the supplement that appeared in the *Journal of Botany* for 1909. They hope that readers will contribute corrections and additions that will form the basis of an entirely new edition which will be prepared by themselves, David Pearman and others.

The sort of information they are seeking is:

1. Amendments and changes to the 'first records' as listed by Clarke.
2. Reports of omissions in records made up to 1900.
3. Information on the first records, and published source, of native plants added to the British flora since 1900.
4. First records of aliens in the British flora, with note of published authority.

This is an excellent opportunity for all members to take part in a project that does not involve strenuous exercise! Available from Summerfield books for £7.99 plus p&p (see their new catalogue page 13).

EDITORS

PROFILES OF NEW HONORARY MEMBERS

DECLAN A. DOOGUE PH.D., F.L.S.

Declan joined the Society in 1971. He has served on the Committee for Ireland (Cfi) at all levels and perhaps most notably as Field Secretary. He also survived a stint on Council. The Recorders' Conference of 1972 marked the commencement of his singular and influential impact on the Society, botany in Ireland, and on other biological recording schemes. He has been described as the Society's pillar in Ireland!

I first met him in the field in 1988 at a meeting in North Tipperary organised as part of The Monitoring Scheme. David Allen, if my memory serves me correctly, was present. We were all organised into groups at crossroads and duly scattered to the four winds, returned to the rendezvous point before moving on. This was my first introduction to systematic recording and to bramble microspecies! At one stage I felt that perhaps my identification skills were under critical examination. However I must have passed the test, as some months later I was offered the Vice County Recordership of H10.

Declan joined The Dublin Naturalists' Field Club as a junior member in 1964 and subsequently served the Field Club in all offices, including two terms as President. In 2004 he was elected Honorary Vice President, marking 40 years of continuous and dedicated service. Since the Club's foundation in 1886 only four people have been so honoured. His most illustrious predecessor was perhaps Robert Lloyd Praeger. On the publication of the latter's *Irish Topographical Botany* (ITB) in 1901, W.F. de

Vismes Kane stated: 'Truly only a modern Mannanán Mór MacLir [the Celtic god who was said to circumnavigate Ireland in twenty-four hours], could so swiftly traverse the country and sample its productions.' A century later this tribute to Praeger could equally be applied to Declan Doogue, but those who know him would consider it to be a very inadequate acknowledgment of both the quality and quantity of his contributions to Irish botany and natural history.

As an organiser and motivator of naturalists Declan is without peer. It is almost impossible to describe his influence in the encouragement and motivation of others. I give just one indicator. Some years ago, an analysis of the 'origins' of the Society's Vice County Recorders in the RoI showed that almost all of them were either present or past members of the Dublin Naturalists' Field Club and thus had been nurtured and encouraged by him.

His interests in natural history are very diverse. Perhaps his multiskilling is partly due to the relative scarcity of naturalists in Ireland. Invertebrates have always been one of his special interests. He became organiser of the Isopoda Recording Scheme in 1975 and together with Paul Harding he produced the material for the *Distribution Atlas of Woodlice in Ireland* (1982). Over a period of six years he built up a team of 'woodlousers' using his unique skills in leading and teaching relatively inexperienced naturalists in field craft and identification. He traversed the country like a Praeger on four wheels. With Fairhurst, Blower and Harding *A review of Irish millipedes* was published in the *Bulletin of the Irish Biogeographical Society* (IBS) in 1995. Declan is also a founder member of the IBS launched in c.1976. Many of his protégés have and are making their mark on Irish natural history. His own interest in molluscs, millipedes and ladybirds have left a lasting impression on many former pupils of his school where is now Vice Principal – surely an onerous responsibility in itself.

His first known publication was a report of *Ulex galli* and *Lathraea squamaria* in Finglas, Dublin, not far from his home, in the *Irish Naturalists' Journal* in 1968. The tip of the 'iceberg' is noticeable in acknowledgments of his contributions in many publications, such as, *Atlas of Ferns of the British Isles* (1978), *Areas of Scientific Interest* (An Foras Forbartha 1981) and the Society's *Rose Handbook* (1993). Arthur Chater judged his contribution to the *Flora of Inner Dublin* (1984) in the following words: 'The history of the flora is brilliantly covered in a long chapter by D. Doogue ...' For the *Flora of County Dublin* (1998), he organised a network of co-recorders who surveyed the county on a one kilometre grid. He led the identification of critical species, as well as carrying out his editorial and writing activities which included a substantial chapter on the history of the study of the flora and also an overview of one of the botanical districts in the county.

While masterminding the latter project, amongst many other schemes, Declan was also working on his doctorate in the Botany Department of Trinity College where the late David Webb held him in the highest of esteem and worthy of inheriting his mantle. His 1994 thesis, a two-volume document, was wide ranging and entitled the '*The Composition of the Hedges of Leinster, Ireland, with particular reference to the Taxonomy and Ecology of the Genus Rosa Linnaeus*'. It is worth noting that Declan was accepted as a doctoral candidate without the need to have the normal perquisite of a cognate honours primary degree. One of his supervisors has remarked 'Declan proved adept at detecting signs of hybridisation and of variations at varietal level, so that he left the taxonomy of Irish roses considerably more complex than he found them!' Certainly *Rosa stylosa* has never since been the same!

To date, his contributions to biological recording and conservation have been immense, especially as the major contributor of data to the now defunct Irish Biological Recording Centre. Happily these records appear to still exist! Declan has been to the forefront in effort to recreate a National Centre from its ashes and has persevered in his efforts despite bureaucratic obfuscation and the peculiarly asymmetric nature of the flow of data across the Irish Sea.

It is an impossible task, and certainly premature, to put Declan's contribution to Irish botany in perspective, especially since those of us who know him can confirm that he still has undiminished energy, enthusiasm and ideas – as he should have at his young age! His most recent and Herculean effort has been the co-ordination of the work for the *New Atlas* in the Republic of Ireland. There can be no argument that without his very positive single-minded and 'can do' approach the project would not have succeeded. We await with relish the *Flora of County Kildare* (H19).

It is difficult to know whether or not Declan has any hobbies given the diversity of his activities. He is alleged to be a quiz grandmaster. He does collect books and has an unparalleled library with many volumes, of interesting provenance, related to Irish natural history.

I am very pleased to propose Declan as an honorary member of the Society.

DAVID NASH June 2004

ROSALINE MURPHY

When I was asked to write a paragraph or two in appreciation of Rose Murphy I greeted the idea with trepidation lest I failed to do justice to the enormous impact she has made on Cornish botany, but also reacted with pleasure at the chance to remember the many years of field work we have enjoyed together.

I first met her in a lane in 1987 when, as a total stranger she came up to me and said ‘Your husband is tall. I wonder if he will get that grass for me from the top of the bank?’ And that was my introduction to this supremely focussed and dedicated botanist. The following year and for many years after that we met regularly to botanise in East Cornwall, first on the Monitoring Scheme and then working on the Flora of Cornwall, the Tetrad Atlas.

There is a long and honourable tradition of botanical recording in Cornwall and for 20 years Rose has continued and developed it as Recorder for v.c. 2. Her rigour in identification and meticulous records, enhanced by annotated notes and supplementary notes is legendary. She takes enormous pains to teach and explain points of identification both to one as an individual, or when leading an outing or a training day for a group. Indifferent health at times may well have led a less focussed person to lay down her lens and recording cards much sooner, but in fact it was only this year that she relinquished the task of BSBI Recorder.

However, she continues with her enormous work load encompassing Cornish ferns, fumitories, arable weeds, rare and scarce plants ... Rose has left a huge legacy to botany in Cornwall, including the *Flora of Cornwall*, the *Botanical Cornwall* publication which she has edited annually for over 12 years and her inspiration and encouragement to others has led to the formation of a very active Botanical Cornwall group of field botanists. I know I speak for all of us to say it is a pleasure and an honour to work with her.

MARY ATKINSON. April 2004

EDITORIAL

We regret to report that Mrs Joan Hall of Poole, Dorset, died on Saturday August 28th following a short illness. We extend our sympathy to her husband Peter; both joined the Society in 1952 and were very active members for many years.

Plant Records, *Watsonia* - Mike Porter (Cumbria) has taken over responsibility for ‘Plant Records’ in *Watsonia*. All being well, the records for 2003 will appear in the February 2005 edition of *Watsonia*.

New email address - Ailsa Burns’ email address has changed to Ailsa5th@aol.com

Urtica dioica: New member Keith Wheeler has just published the first ever book on nettles; *A Natural History of Nettles* and full details can be found on the website www.Trafford.com The 312 page book includes 142 coloured photos or drawings which, although in black and white in the book are reproduced in full colour on the accompanying CD. The book (incl. CD) is a snip at £14.99 [ISBN 1-4120-2694-6].

Colour section (centre pages): Plate 1: Violet and white flowered Pansy (p. 29); *Tuberaria guttata* (p. 19); *Epipactis helleborine* pollinia on *Agrostis capillaris* (p. 20); Double flowered *Ranunculus acris* (p. 19). Plate 2: *Dictamnus albus*, *Dracocephalum austriacum* & view nr Prague (p. 55); *Saxifraga media*, *Campanula persicifolia* & view of Catalan Pyrenees (p. 55). Plate 3: *Primula farinosa*, 7 life phases (p. 23); *Gnaphalium coarctatum* (p. 53). Plate 4: Algal endophytes in roots of *Lemna minuta* (p. 34).

Diary – moved to p. 70 to accommodate some Important Notices that one editor (RGE) forgot about!

EDITORS

NOTES FROM THE ACTING HON. GENERAL SECRETARY

Development Officer and Scottish Officer: At the Meeting in March, The President, the Treasurer and myself were authorised to try and progress the two new posts then in train.

By the end of May we had received and accepted an offer from SNH for 50% funding of the Scottish Officer post and more or less 100% offers from CCW and EN, with some funding from SNH, for the Development Officer Post and support. We have held the first meeting of the Scottish Steering group in Edinburgh, suggested amendments to the contract with them, and advertised in the *New Scientist* (24th June). Interviews took place on August 17th and we are delighted to say that we have chosen Jim McIntosh as the BSBI Scottish Officer. Jim currently works for SNH as an Area Officer; is our joint Recorder for v.c. 88; and carried out a considerable amount of montane botanical recording in Scotland for the *New Atlas*. He will be based at the Royal Botanic Garden, Edinburgh and takes up his new post on November 1st.

We have to arrange a Development Officer Steering group, and do quite a lot of work in refining the work programme – hopefully most of this can take place after the field season! We did advertise for this post too, but we and the agencies have points to resolve over the base and commitment for the three year period, so we have written to the applicants putting matters on hold. Again, as I mentioned in *News* last time, will any member who would like to know more please contact me. (None did then!)

New books from BSBI: Most of you will recall the flyers that went out with the January *News* for the new Bramble Atlas and the Cumulative Index to *Watsonia*. They have both now been published, and I feel that a note here might tempt those who hesitated to buy such apparently off-beat titles! The Bramble book is extremely well produced, and covers all the mainstream species, but it is the introductory chapter on Phytogeographical analyses, covering also species endemic to Britain, that is really interesting.

The *Watsonia* Index is an unexpected joy too! I wish it included issues up to now rather than ending in 1995, but that just shows how many years it has been in gestation! Open it at any page, and you think, gosh, that's interesting, must go and look at that article or book review. But as the index is by my bedside (some botanists have strange habits) and the back issues are downstairs.... It really is a *vade mecum*, and I must congratulate Chris Boon on a super and huge task completed.

Membership Secretary: John Swindells, known to many members, has agreed to assist Gwynn Ellis in both welcoming new members and putting them in touch with their V.c. Recorder (and their V.c Recorder with them) and the like and trying to retain those who forgotten to renew or who are haver-ing!

Notable plant records: Our dramatic findings are listed in *Watsonia*, x months or years after the event, and only occasionally in *News*. Many of you will be aware of other exciting discoveries, but some that have come my way include *Tuberaria guttata* (Spotted Rock-rose) found in Coll – previously this was only known from the Channel Islands, North Wales and Western Ireland, so this is a very notable extension of range (see page 19). Another is *Hierochloa odorata* (Holy Grass) from a river bank in Northumberland, the first record for the British Isles outside Scotland. *Damasonium alisma* (Starfruit) was discovered in Surrey at a new site, though seed had been scattered in the vicinity in past years.

Cypripedium: This attraction to most members has been in the news again. There was an excellent article in the *Independent* (22nd June, 2004) on the mystique and secrecy around the one remaining site. Members will recall that there has been a long-running and costly breeding and re-introduction programme involving EN and Kew (albeit with private funding), and that our member, Margaret Lindop, sits on the committee responsible for this.

Around July 22nd many newspapers carried lurid articles on the theft from a quarry near Silverdale golf course, where it had 'flourished for 80 years'. I note that the Red Data book mapped it as alien

there (which we followed in the *New Atlas*), and heard rumours that it was actually cut off by a local resident, fed up with people parking outside his door, and that it might not have been the British native anyway, but a closely allied American variety planted out there. There are always several versions of any story about this plant!

Bluebells and Plantlife: Plantlife have produced (and widely trailed in the Press) a report '*Bluebells for Britain*', based on a survey by Plantlife members of 4500 sites across England and Wales, with less in Scotland and only a very few in Ireland. Press reports were (predictably) almost entirely gloomy, but the report itself found that one in six broadleaved woodlands recorded had a mixture (*i.e.* native alien and/or hybrids) of bluebells present.

My personal view is deep scepticism. I have seen very many hybrid populations, near habitations or on road verges. I have surveyed, with colleagues, over 600 woods containing bluebells in Dorset, and never saw a single hybrid. Colleagues whom I have consulted know of no spread by seed of the hybrid – or even if this is likely – and no data on gene flow from the hybrid (via pollen). Plantlife have now asked the Royal Botanic Garden, Edinburgh to investigate these points, and I do feel that although it is as well to be on the alert for a possible threat, it is premature to be party to such doom and gloom.

The report does recommend licences for collection of native seed so as to meet the growing demand for bluebells – marginally ironic as it was Plantlife who were largely responsible for getting bluebell collection put on Schedule 8 in the first place.

Of equal interest to me and other colleagues is the apparent spread of native Bluebells, both in woodland and in hedgerows, and into open grassland, by the sea and inland. A re-survey in 2002 by Nick Button of 350 hedges in Dorset, originally recorded by Prof. Good in the 1930s, found a massive loss of native plants, but a significant increase in records of *Arum maculatum*, *Mercurialis perennis*, *Allium ursinum*, *Brachypodium sylvaticum* and *Hyacinthoides non-scripta*. This is not the place for conjecture as to the reasons for this – I could offer quite a few thoughts and some hard evidence – but to ask if any member would like to explore this more fully.

Stoneworts and Plantlife: Plantlife have published a report, produced for them by Nick Stewart, on important stonewort areas in the UK, which is excellent and timely. This is available from Summerfield Books. There is also a much fuller report with detailed maps and sites, but I am not sure how widely available this is.

British Bryological Society Bulletin: Many BSBI members are BBS members too, and will have seen the beautifully produced new format of their Bulletin, filled with interesting articles. I would be interested in the economics too.

Extinction of botanists: The late Franklyn Perring organised a meeting at the Linnean on this widely held view (I dissented). I see a note in *The Garden*, June 2004, by our member Phil Gates, from Durham University that 'Changes caused by global warming could be missed because of a serious decline in field botanists' caused as funding for some of the more traditional skills in plant sciences, such as taxonomy and systematics declines in many universities. According to the Higher Education Statistics agency, only 55 people received a first degree in Botany in 2003, compared with 337 in 1974.

Linnean Society Bloomer Award: Ro FitzGerard, known to many of us through her rare plant work for NCC and for Plantlife and the National Trust, and still our joint Recorder for Wexford, though currently 'resting' from membership, has won this prize for 2004.

Address: A recent letter received addressed to Davod Perm, Fock, Turd, Cornwall!!

DAVID PEARMAN, Acting Hon. General Secretary, August 2004.

BSBI PROJECTS

BSBI Local Change

I am pleased to report that fieldwork is progressing well and that a number of recorders have continued to send in data, even during the peak of the field season. There are now over 143,000 Local Change records on the BSBI hub. Of course, there are many taxa with more than one entry per tetrad. The actual number of distinct records is over 84,600 and this is already over half the number recorded for the Monitoring Scheme in 1987 and 1988.

I have managed to do a little fieldwork myself. I was particularly pleased to be able to join two of the Scottish Local Change field meetings – in East Sutherland and in Wester Ross. It was a great pleasure to meet all those who attended and it was very instructive to do Local Change in areas very different from my own in East Anglia. I'm sure this will be most helpful when it comes to interpreting the data and producing reports. To see species such as *Pinguicula lusitanica* (Pale Butterwort), *Orthilia secunda* (Serrated Wintergreen) and *Carex limosa* (Bog-sedge) was a delightful bonus.

Many thanks to everyone involved in the project so far and in particular to all those who organised Local Change meetings during the summer.

MapMate:

Many BSBI members are now using MapMate to record their data on computer. I have had several requests to include hints and tips for MapMate in *BSBI News*. As it is not really appropriate to fill up *BSBI News* with MapMate information, in future I am considering sending out an email newsletter for BSBI MapMate users. If you would like to subscribe to such a thing, please let me know (and let me have your email address). In the meantime, here are just a few to be going on with:-

Website and User Group:

It is well worth visiting the MapMate website (www.mapmate.co.uk) on a regular basis and registering for the User Zone. Here you can acquire updates and request the email newsletter, 'Alerts', which announces the release of patches and gives useful advice. There is also a MapMate Users e-group, which you can join by invitation – if you would like details, please let me know.

Data Entry:

I find it very useful to 'Save Common Settings' (Records menu) when I get the first record for a field card set up. Invariably some interruption ensures that I can't complete a card in one go, and 'Get Common Settings' means I don't have to repeat the set up process.

Locking fields prevents them being blanked out after every save. When entering a field card, I usually keep them all locked except the taxon in order to save re-entering anything other than the species. However, Roy Sherlock points out that leaving one additional field unlocked (e.g. Determiner) can help to prevent duplicate entries.

There are a number of shortcut keys available as alternatives to using menu options and it is worth getting familiar with several of these. For example Ctrl+L will lock all fields and Ctrl+U will unlock them. These shortcuts are shown against the name of the option in the menu list.

It is always best to press Enter (or Return) after entering data in a box. This will ensure the value is validated there and then, whereas Tab will simply move on to the next box. This is particularly important when entering dates. Also, if you press Enter on a blank Stage or Status, 'not recorded' will automatically be entered. Similarly, with the Determiner box blank, the Recorder name(s) will be copied.

Defaults:

The majority of users probably do not need to be concerned with defaults. However, if you are entering data in more than one vice-county, you should be aware that the default sites group will need to be changed to the relevant vice-county or set to 'All' so that existing sites can be selected. Use 'Change Defaults' on the Records Menu or the 'Defaults' tab on the properties window. For a vice-county or area to be available on these drop-down lists it needs to be added to your areas of interest in 'My Configuration'.

Changing defaults also affects Analysis. For the technically minded, MapMate creates a second table, Sites/Default, that is a subset of the full sites list. The majority of queries use this subset rather than the full sites table. It is also worth noting that if you open an atlas, the default sites group will be automatically changed to the group defined for that atlas. The same principles apply if you are recording more than one taxonomic group, such as charophytes as well as vascular plants.

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CO-ORDINATOR'S CORNER

Information on introductions

In our newsletter to county recorders earlier this year we sent out details of all known introductions of rare plants, with a request for more records. The response was fabulous (thank you, all) and has greatly increased our knowledge of this often secretive activity. Do please keep the records coming, and I shall continue to document the progress of each introduction on the TPDB. Less impressive was the information on any follow-up to the original plantings, and I am not sure whether this is because many failed within their first year, or simply because no-one has monitored them. It seems to me that the most important thing for any introduction is to document the process. This should include notice of the intent to introduce, followed by an assessment of the project afterwards; perhaps after three years or so. The precise location does have to be given in these publications or they are effectively useless. BSBI News has been a good forum for such items in the past and seems to me to be the most suitable journal for the purpose. Ron Porley's note in the last issue of *News* (96: 27) is an example of good practice.

Images of the Hull Herbarium

I was impressed with the latest offering from Dick Middleton at the University of Hull. He has produced a CD with images of all the specimens of pteridophytes in the herbarium which, like his web site, sets a new standard. The main problem with images of herbarium sheets has been that to get them at a sharp enough resolution to identify the plants or read the collector's handwriting the files were so big that they were very slow to use. The Hull CD makes use of new technology to display the images at different resolutions as you zoom in – making it much more user-friendly. Until now I have not been an advocate of making images of herbarium sheets, and I still think one should catalogue a collection of a database first, but this is an interesting advance. There is guidance on managing collections at www.bsbi.org.uk.

Wild *Gladiolus* research

Last winter Geoff Toone, Martin Rand & I spent some time compiling all the data we could find on Wild *Gladiolus* (*Gladiolus illyricus*), and now have an extremely good account of the species in Britain. But we can't really explain what it is doing here, and feel we need research into its genetics to elucidate its origins.

The books say it is a native species, but you have to ask yourself what that really means. By and large, rare native species in Britain are confined to the north and west, because our climate used to be much colder, and this is where they have retreated to. But the gladioli are Mediterranean plants, and would seem to fit much better into the category of archaeophyte. The story of the Wild Glad is quite intriguing. It was not discovered until 1851, by which time its introduced relatives had been cultivated in this country for hundreds of years. This didn't stop the indomitable William Bromfield from declaring that it was undeniably a native plant, and he did have a manner that came rather close to challenging anyone to a duel if they dared to suggest otherwise. Watson, of course, thought otherwise, and he was usually right, but Bromfield's view seems now to be the accepted one. But he never explained quite how he thought it got here without human help, and we have discussed three possible mechanisms: firstly, the classic bird's foot method, which is uncomfortably close to admitting that it is an introduction secondly; the 'continuous garrigue' theory, which postulates unbroken arid habitat through which

it spread from the Med to Hampshire across the land bridge. That one has serious consequences for archaeology. Thirdly, there is the 'alternative habitat' theory, which is that the Wild Glad is really a woodland plant, only all its trees have been cut down, both here and in the Med. This is tempting, but there is not a lot of evidence for it.

If you reject these, then the only real case for the Wild *Gladiolus* to be considered native is if it is a genuinely new species – a hybrid or a polyploid, perhaps, that arose *de novo* from cultivated plants. That would give it the same status as Welsh Ragwort (*Senecio cambrensis*), a truly native plant with foreign ancestry. We clearly need geneticists to help sort out this one. It doesn't really matter if a plant is native or not, but it certainly helps us to understand its ecology, and that in turn would be useful if we want to conserve it.

County Conservation Lists

County RPRs are now widely accepted as a useful publication. They force us to concentrate on one of the most important groups of plants, and make sure our records are in order and fully up to date. It is easier to produce an RPR than an entire Flora, and in some ways more satisfying, because you can go into more detail.

For those who have finished their RPR, or are well under way, there is a logical next step: county conservation lists. Several counties have them already, but I must admit that I have only come across two or three that were done well. The idea is that for each county there is a list of about 300 or 400 plants that are indicators of the best habitats – species-rich grasslands, ancient woodlands, etc. It is not an easy thing to define because, for instance, the indicators of good quality sand dune habitat might be early colonisers, whereas the indicators of good grasslands or woodlands are of course poor colonisers. Serious thought has to go into this process but, as I mentioned, some counties have already done it quite well.

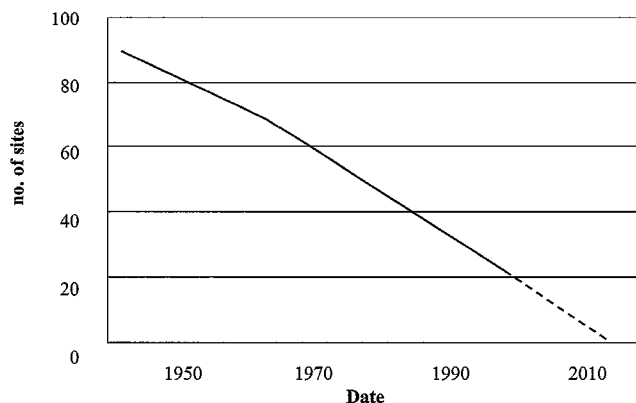
A conservation list can be used, for instance, in grading wildlife sites and SSSIs, and it should be the plants on the CCL that are cited in the reasons for designation. This matters, because the site condition monitoring needs to focus on the plants of conservation importance. In the longer term, it is the CCL plants that should be used to monitor the state of the environment, not the rarities on the Biodiversity Action Plan. We need to start thinking about building up good data on these species.

I would be very grateful for a copy of any county list so far prepared, and it would be good if county recorders could start thinking about the plants that are most appropriate for their area. If you want to know more, keep an eye on the BSBI web site or have a look how we did it for Shropshire at www.shropshirebotany.org.uk

Evidence-based Reviews

At our Science & Research Committee meeting earlier this year we heard from Dr Andrew Pullin of the University of Birmingham about the evidence-based review process, and how it is being used in nature conservation. The idea is very simple: find out what empirical data there is about the consequences of any particular action – the effects of burning on moorland, for instance – and then reconsider your actions in the light of this.

I would love to see an evidence-based review of the effects of canal redevelopment on water plants. It seems that almost nothing has been published on this, and the only really good canal survey that I have come across is the one that Jonathan Briggs and colleagues did on the Montgomery Canal in the 1980s. Almost uniquely, that one was published and made widely available. Almost everything else to do with canal ecology is purely experience-based, and it seems that you can say anything and get away with it. Take, for example, the UK BAP's position on Floating Water-plantain (*Luronium natans*). According to the web site (www.ukbap.org.uk) this species is fluctuating, with no clear trend. According to the TPDB, however, there is something of a trend, which I have extrapolated into the future in the graph below. At the current rate of decline, it will soon become extinct in canals, and if you look at the known threats and proposed 'restorations', there is good reason to believe that the prediction is reasonably accurate.

Luronium natans in canals in Britain

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RECORDERS AND RECORDING

PANEL OF REFEREES AND SPECIALISTS

We are sorry to report the death of **Dr Stan Woodell**, who was Referee for *Primula* for many years.

Cameron Crook, our referee for Introduced and Cultivated Trees has sent the following note:

Due to an uncommonly busy season, I would like to apologize to all members who have sent me tree samples for determination and are still awaiting a response. It is my intention to deal with all outstanding determinations at the close of the field season (from the end of September onwards) so all will hopefully have received a response by Christmas! Sorry for the delay and I hope it hasn't caused you any undue problems'.

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PANEL OF VICE-COUNTY RECORDERS

No changes since those in *BSBI News 96*

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THE DAFOR SCALE AND TETRAD RECORDING ON THE ISLE OF RUM, INNER HEBRIDES

Angus Hannah (*BSBI News 95*, 11-12) and Christopher Lowe (*BSBI News 96*, 11-12) raise a number of interesting points regarding the use of the DAFOR scale (Dominant, Abundant, Frequent, Occasional, Rare) to augment standard field recording. We recently used this method whilst recording the flora of Rum and found it to be a very efficient approach which, for very little extra effort, allowed us to calculate the relative abundance of species for the island as whole.

As part of a survey of the Isle of Rum in 2003 we asked pairs of recorders to classify the abundance of common taxa found in each tetrad using the DAFOR scale. Although this increased the time taken to complete each tetrad (an 'average card' of between 150-200 species took approximately 15 minutes)

feedback on the method was generally positive. However, a few recorders felt the distinction between the 'occasional' and 'frequent' categories was unclear and, as a result some species were classified as 'locally frequent'. In addition, one or two felt that the system was too onerous after a long day in the hills (and that it removed some of the fun!) and so a small number of tetrad cards were not completed. In addition, aquatic species were excluded as these had been recorded in a previous survey.

Once inputted the field DAFOR scores were then used to calculate an overall 'index of abundance' for each species for inclusion in the text of the flora currently in preparation. To do this we converted each category into a numeric score (i.e. R = 1, O = 2, LF = 2.5, F = 3A = 4, D = 5) and then calculated an 'average' score for the tetrads in which the species had been assigned a score. For ease of comparison abundance scores for infraspecific taxa were combined. This allowed us to calculate average abundance scores for 298 species and then compare these with the tetrad frequency of the species on the island (Figure 1).

The species which were most widespread (in terms of tetrads) and abundant (in terms of DAFOR) are presented in Table 1. Only *Pedicularis sylvatica* (Lousewort) was recorded from all 39 tetrads whereas *Festuca vivipara* (Viviparous Fescue) was recorded in 37, five species from 36 and ten from 35. Not surprisingly the majority of these species were associated with the blanket bog and moorland which dominate extensive tracts of the island (e.g. *Eriophorum angustifolium* (Common Cottongrass), *Calluna vulgaris* (Heather), *Narthecium ossifragum* (Bog Asphodel)), whereas others, such as *Plantago lanceolata* (Ribwort Plantain), *P. maritima* (Sea Plantain), *Potentilla erecta* (Tormentil) and *Thymus polytrichus* (Wild Thyme) are virtually ubiquitous on the island in a variety of habitats ranging from coastal grassland and saltmarsh to ultrabasic 'debris' on the highest mountain peaks.

Species which were both widespread and abundant included *Calluna vulgaris*, *Eriophorum angustifolium*, *Festuca vivipara* and *Thymus polytrichus* whereas *Molinia caerulea* (Purple Moor-grass) (the most abundant species on the island), *Anthoxanthum odoratum* (Sweet Vernal-grass), *Carex echinata* (Star Sedge), *C. panicea* (Carnation Sedge), *Deschampsia flexuosa* (Wavy Hair-grass), *Erica cinerea* (Bell Heather), *Succisa pratensis* (Devil's-bit Scabious) and *Trichophorum cespitosum* (Deergrass) were all equally abundant but slightly less frequent. Once again the majority of these species were associated with blanket bog and mire (e.g. *C. echinata*, *E. cinerea*, *T. cespitosum*) as well as acid grasslands (e.g. *A. odoratum*, *C. panicea*, *F. vivipara*, *P. erecta*, *S. pratensis*), which although more localised occur across a wide range of environmental conditions on the island (e.g. coastal cliffs, sand dune, rock outcrops, mountain slopes, summit debris, etc).

In general, there was a strong positive relationship between the frequency and abundance of species on Rum with rare species tending to occur in small numbers and widespread species being abundant where ever they occurred (Figure 1 $R^2 = 42.8\% F_{1,297} = 222.87 p < 0.001$). However, as Figure 1 shows, there were a few exceptions to this general rule. For example, there were a small number of species which although occurred in only a few tetrads were 'frequent' to 'abundant' in the specialised communities which were widespread (e.g. *Alchemilla filicaulis* (Hairy Lady's-mantle), *Ammophila arenaria* (Marram), *Arabis petraea* (Northern Rock-cress), *Dryopteris oreades* (Mountain Male-fern), *Minuartia sedoides* (Cyphel)). Conversely, there were a number of species with scattered distributions (Table 2) which were always recorded in small numbers (i.e. were always recorded as 'rare'), the most notable being *Cirsium arvense* (Creeping Thistle), *Eleogiton fluitans* (Floating Club-rush), *Equisetum sylvaticum* (Wood Horsetail), *Rhynchospora alba* (White Beak-sedge) and *Rumex acetosa* (Common Sorrel).

As Hannah and Lowe point out, dominant species rarely occur in nature. This is borne out by the results presented in Figure 1 as very few species (on average) were recorded as dominant within tetrads. However, one of the main advantages of the DAFOR system is that it provides a *relative scale* which allows us to 'measure' abundance in relation to the extremes of rarity and ubiquity. We would therefore argue to maintain the 'D' in DAFOR for those few monotonous tetrads (or other recording units) where *Molinia caerulea* or *Calluna vulgaris* really do stretch for as far as the eye can see. One improvement might be to formalise these categories into a (semi-)quantitative scale to be applied subjectively (and rapidly) by recorders. The black and white images used to train vegetation surveyors to record % cover in quadrats would probably suffice and could be elaborated to cover much larger scales (as well as abundance categories).

In addition, we may also need to refine the DAFOR scale to better cover the midpoints between the categories. Lowe suggests using a 'local' category (as we did here) as a prefix to specify the clumped distribution of certain species (e.g. 'locally abundant') whereas Hannah divides abundance into three categories (plentiful, never numerous, very few plants). An alternative method which has been widely used in vegetation surveys is to imagine two separate DAFOR scales: one widespread and the other local. Species which have the same DAFOR at each scale fit the traditional categories (i.e. DD, AA, FF, OO, RR) whereas those that are more abundant at the local scale (i.e. have clumped distributions) can be assigned accordingly (e.g. RF, RA, OF, OA, FA, FD, AD, etc.). Although some of these combinations are rarely encountered (e.g. RD, AD) it does provide a very flexible system which, although requiring slightly more effort on the ground, can give a very accurate picture of a species' abundance. One final point should be made regarding estimates of frequency. Although Hannah proposes a three point scale (plentiful, never numerous, very few plants) we suggest that the number of recording units (i.e. compartments, sites, grid squares) from which a species is recorded is probably a much more efficient measure of frequency in most recording schemes.

Whether or not a standard DAFOR procedure is practical or indeed desirable remains to be seen, but we hope that these preliminary analyses from Rum will provide recorders with a little food for thought and stimulate further discussion and experimentation along similar (or other) lines.

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Table 1. The most frequent and abundant species recorded on Rum in 2003.

	Freq.*	Abund.		Freq.*	Abund.
Most frequent			Most abundant		
<i>Pedicularis sylvatica</i>	39	2.6	<i>Molinia caerulea</i>	34	4.1
<i>Festuca vivipara</i>	37	3.1	<i>Minuartia sedoides</i>	1	4.0
<i>Eriophorum angustifolium</i>	36	3.0	<i>Calluna vulgaris</i>	35	3.7
<i>Narthecium ossifragum</i>	36	2.6	<i>Trichophorum cespitosum</i>	32	3.2
<i>Pinguicula vulgaris</i>	36	2.5	<i>Festuca vivipara</i>	37	3.1
<i>Polygala serpyllifolia</i>	36	2.5	<i>Erica cinerea</i>	34	3.1
<i>Plantago lanceolata</i>	36	2.1	<i>Potentilla erecta</i>	35	3.1
<i>Calluna vulgaris</i>	35	3.7	<i>Eriophorum angustifolium</i>	36	3.0
<i>Potentilla erecta</i>	35	3.1	<i>Dryopteris oreades</i>	1	3.0
<i>Thymus polytrichus</i>	35	2.7	<i>Alchemilla filicaulis</i>	1	3.0
<i>Blechnum spicant</i>	35	2.6	<i>Anthoxanthum odoratum</i>	33	2.9
<i>Carex pulicaris</i>	35	2.6	<i>Succisa pratensis</i>	34	2.9
<i>Carex viridula</i> ssp. <i>oedocarpa</i>	35	2.5	<i>Carex echinata</i>	34	2.9
<i>Plantago maritima</i>	35	2.5	<i>Deschampsia flexuosa</i>	33	2.8
<i>Viola riviniana</i>	35	2.4	<i>Pedicularis sylvatica</i> s.l.	18	2.7
<i>Primula vulgaris</i>	35	2.3	<i>Thymus polytrichus</i>	35	2.7
<i>Luzula multiflora</i>	35	2.2	<i>Carex panicea</i>	34	2.7
<i>Molinia caerulea</i>	34	4.1	<i>Ammophila arenaria</i>	3	2.7
<i>Erica cinerea</i>	34	3.1	<i>Narthecium ossifragum</i>	36	2.6
<i>Succisa pratensis</i>	34	2.9	<i>Carex pulicaris</i>	35	2.6
<i>Carex echinata</i>	34	2.9	<i>Pedicularis sylvatica</i>	39	2.6
<i>Carex panicea</i>	34	2.7	<i>Blechnum spicant</i>	35	2.6
<i>Gallium saxatile</i>	34	2.5	<i>Carex binervis</i>	32	2.6
<i>Drosera rotundifolia</i>	34	2.3	<i>Hypochaeris radicata</i>	32	2.6
<i>Prunella vulgaris</i>	34	2.2	<i>Plantago maritima</i>	35	2.5
<i>Trichophorum cespitosum</i>	33	3.2	<i>Carex viridula</i> ssp. <i>oedocarpa</i>	35	2.5
<i>Anthoxanthum odoratum</i>	33	2.9	<i>Galium saxatile</i>	34	2.5
<i>Deschampsia flexuosa</i>	33	2.8	<i>Pinguicula vulgaris</i>	36	2.5
<i>Festuca rubra</i>	33	2.4	<i>Polygala serpyllifolia</i>	36	2.5
<i>Carex nigra</i>	33	2.4	<i>Dactylorhiza maculata</i>	32	2.5
<i>Juncus bulbosus</i>	33	2.3	<i>Arabis petraea</i>	2	2.5

*Some of the frequencies given above (e.g. *Minuartia sedoides*) are underestimates as DAFORs for some tetrads were not completed.

Table 2. Species with an average DAFOR of 1 (rare) but recorded from more than 1 tetrad.

	Freq.		Freq.
<i>Achillea ptarmica</i>	5	<i>Eleogiton fluitans</i>	6
<i>Alopecurus geniculatus</i>	4	<i>Equisetum sylvaticum</i>	7
<i>Botrychium lunaria</i>	4	<i>Glyceria fluitans</i>	5
<i>Cirsium arvense</i>	6	<i>Hymenophyllum wilsonii</i>	4
<i>Conopodium majus</i>	4	<i>Pinguicula lusitanica</i>	5
<i>Corylus avellana</i>	5	<i>Poa pratensis</i> s.l.	5
<i>Cystopteris fragilis</i>	5	<i>Rhynchospora alba</i>	6
<i>Dactylorhiza purpurella</i>	4	<i>Rumex acetosa</i>	9
<i>Draba incana</i>	5		

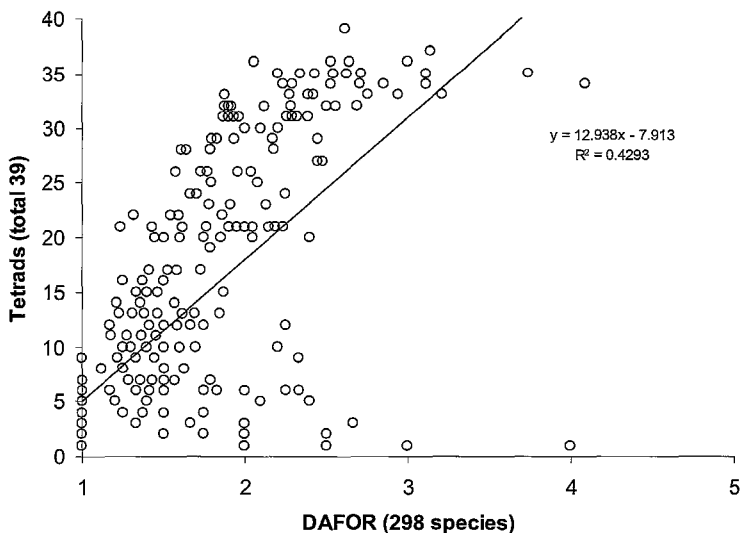


Figure 1. The relationship between the abundance and frequency of species recorded on the Isle of Rum, Inner Hebrides in 2003. See text for explanation.

AREAS AND SPECIES RICHNESS OF BRITISH VICE-COUNTIES

One spin-off from the *Vice-county Census Catalogue* (Stace *et al.* 2003) is that for the first time ever we can calculate the number of vascular plant taxa recorded for each British vice-county. Another set of data not previously available is the area of each vice-county. We thought that this information might be of interest to many botanists, especially as estimates of both the above that have appeared in the literature over the past century show considerable variation. A few words of explanation are required.

The number of taxa includes only those species, microspecies, subspecies and hybrids that are listed in the printed VCCC, *i.e.* the taxa in Kent (1992) plus its two Supplements (1997, 2000), as well as the extra taxa included in Stace (1997). In other words the extra casuals and extinct neophytes in Clement & Foster (1994) and Ryves *et al.* (1996) are excluded. If very precise numbers are required it must be remembered that in a few vice-counties a very small amount of double-counting has occurred. For example: if two subspecies of a species are recorded pre-1970 only, but the undivided species is recorded post-1970, three rather than two records will be counted; or if a species is recorded pre-1970 as native and post-1970 as alien,

two rather than one record will be counted. Gametophytes and sporophytes of *Trichomanes* are also scored separately. But these considerations will make very little difference to the overall figures.

The areas of the vice-counties have recently been computed following the digitisation of the vice-counties by Landmark/RMSI in connection with the NBN Watsonian Vice-county Digitisation Project, and the results have been kindly conveyed to us by Charles Copp. The vice-counties were first devised to produce units that were far less variable in size than the political counties. The latter varied from 141.36 square kilometres (Clackmannanshire) to 15,733.97 square kilometres (Yorkshire), a ratio of 1 : 111.3. The vice-counties vary from 325.8 square kilometres (West Lothian) to 4,835.46 square kilometres (Easternness), a ratio of 1 : 14.84. If the eight smallest vice-counties (with areas below 700 square kilometres) are disregarded the ratio drops to 1 : 6.72. The Channel Islands, by far the smallest vice-county, are omitted from these calculations and were not included in the digitisation project, but we have utilised the area attributed to them in the *Times Atlas of the World*.

In the accompanying table the vice-counties are listed in their traditional sequence, but the position of each in terms of their numbers of taxa and their areas is given alongside each of those two columns. In terms of the total number of taxa the 'poorest' vice-county turns out to be Orkney, and the 'richest' Surrey (788 and 2,409 respectively, a ratio of 1 : 3.06). The richest Scottish vice-county is Midlothian, and the richest vice-county north of the West Kent/Worcestershire axis is South Lancashire. Probably very little can be deduced from these statistics, because the vice-counties vary not only in area but also in the number of aliens (especially casuals) and the number of agamospecies (notably *Rubus*, *Taraxacum* and *Hieracium*) recorded, as well as the inclusion of areas of coastline, limestone, mountain, etc. Perhaps the effect of having a coastline can be best gauged by comparing the totals for North and South Hampshire, and the effect of having a rich alien flora by comparing the totals for East and West Kent.

The agamospecies and aliens (archaeophytes, neophytes and/or casuals) could be eliminated easily enough. In our table the total number of taxa in each vice-county is broken down into natives and aliens. Actually, counting only native species, Shetland (473) has a lower total than Orkney (541), and Surrey (1182) is only the sixth highest vice-county behind South Hampshire (1265). The VCCC data are now available on the BSBI website, and it is possible for vice-county lists to be generated and for anyone to manipulate the figures as they wish. We leave these possibilities for others to indulge their preferences.

We seriously doubt whether it is feasible to offset the effects of the different sizes of vice-counties, because it is of course not the case that an area twice the size of another will have twice as many taxa, nor even that there is a common correction factor that could be used, because an increase in area might take in more very similar territory or add highly contrasting habitats. Nevertheless, in order to support our doubts, we have calculated the taxa/area ratio in the final column of the table, and have added the position of each vice-county on that criterion. It is hardly surprising that the smallest of the 112 vice-counties possesses the highest taxa/area ratio, or that the largest possesses the third from lowest. Nor that the Channel Islands, much smaller than any of the British vice-counties, has a much higher ratio than any of them. It would serve no useful purpose to devise some 'ideal' correction factor that would result in all the vice-counties being awarded a very similar result, rather as the organisers of a horse-race seek to handicap so that a blanket finish is produced.

We are most grateful to Charles Copp for arranging for the vice-county areas to be calculated by Landmark/RMSI, and for informing us of the results and allowing us to publish them, and to Arthur Chater for commenting on a draft.

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Vice-county	No. of taxa	Native	Alien	Posn	Area Sq km	Posn	Ratio taxa/area	Posn
1 - W Cornwall	1963	1022	941	16	1278.34	89	1.536	12
2 - E Cornwall	1811	1008	803	37	2291.38	42	0.790	60
3 - S Devon	2136	1199	937	8	3626.68	7	0.589	85
4 - N Devon	1743	1055	688	43	3156.04	16	0.552	91
5 - S Somerset	1949	1056	893	21	2042.71	52	0.954	42
6 - N Somerset	2149	1198	951	6	2241.49	45	0.959	27
7 - N Wiltshire	1479	886	593	68	1561.76	80	0.947	43
8 - S Wiltshire	1530	944	586	63	1993.9	54	0.767	61
9 - Dorset	2141	1221	920	7	2573.65	32	0.832	54
10 - Isle of Wight	1421	902	519	73	392.33	111	3.622	2
11 - S Hampshire	2193	1265	928	4	1959.79	56	1.119	25
12 - N Hampshire	1959	1067	892	18	1906.48	61	1.028	33
13 - W Sussex	1834	1101	733	31=	1799.14	67	1.019	34
14 - E Sussex	1958	1118	840	19	2001.73	53	0.978	38
15 - E Kent	1952	1120	832	20	2594.47	30	0.752	64
16 - W Kent	2252	1104	1148	3	1538.24	81	1.464	15
17 - Surrey	2409	1182	1227	1	1960.35	55	1.229	20
18 - S Essex	1843	997	846	30	1703.92	73	1.082	28
19 - N Essex	1827	1019	808	33	2480.62	34	0.737	66
20 - Hertfordshire	1915	960	955	23	1634.92	76	1.171	23
21 - Middlesex	2049	935	1114	13	735.73	103	2.785	3
22 - Berkshire	2071	1041	1030	11	1867.31	62	1.109	26
23 - Oxfordshire	2051	1068	983	12	1944.81	58	1.055	31
24 - Buckinghamshire	1919	979	940	22	1929.19	59	0.995	36
25 - E Suffolk	1909	1062	847	24	2172.1	49	0.879	51
26 - W Suffolk	1584	958	626	57	1696.15	74	0.934	44
27 - E Norfolk	1817	1059	758	34=	2458.77	35	0.739	65
28 - W Norfolk	1853	1109	744	28	2949.44	22	0.628	83
29 - Cambridgeshire	1792	1003	789	39	2213.52	46	0.810	56
30 - Bedfordshire	1817	942	875	34=	1209.22	93	1.503	14
31 - Huntingdonshire	1186	754	432	93	944.68	100	1.255	17
32 - Northamptonshire	1439	870	569	71	2578.25	31	0.558	90
33 - E Gloucestershire	1718	981	737	45	1716.41	72	1.001	35
34 - W Gloucestershire	2158	1205	953	5	1598.09	78	1.350	16
35 - Monmouthshire	1801	1073	728	38	1445.06	86	1.246	18
36 - Herefordshire	1550	1011	539	61	2156.72	50	0.719	69
37 - Worcestershire	2264	1138	1126	2	1830.7	64	1.237	19
38 - Warwickshire	1694	975	719	47	2370.94	40	0.714	71
39 - Staffordshire	1997	1025	972	15	3036.81	19	0.658	76
40 - Shropshire	1669	1022	647	49	3464.62	10	0.482	95
41 - Glamorgan	2087	1181	906	10	2172.7	48	0.961	39
42 - Brecknockshire	1568	1092	476	58	1913.99	60	0.819	55
43 - Radnorshire	1304	876	428	82	1216.34	92	1.072	29
44 - Carmarthenshire	1683	1090	593	48	2435.89	37	0.691	73
45 - Pembrokeshire	1434	961	473	72	1618.7	77	0.886	49
46 - Cardiganshire	1774	1048	726	41	1799.86	66	0.986	37
47 - Montgomeryshire	1320	893	427	81	2055.07	51	0.642	81
48 - Merioneth	1401	960	441	76	1765.54	69	0.794	59
49 - Caernarfonshire	1814	1179	635	36	1499.44	83	1.210	22
50 - Denbighshire	1618	1062	556	55	1847.28	63	0.876	52

Vice-county	No. of taxa	Native	Alien	Posn	Area Sq km	Posn	Ratio taxa/area	Posn
51 - Flintshire	1555	985	570	60	576.64	110	2.697	4
52 - Anglesey	1413	941	472	74	743.64	102	1.900	9
53 - S Lincolnshire	1471	897	574	69	2926.81	23	0.503	93
54 - N Lincolnshire	1639	958	681	53	4171.95	3	0.393	102
55 - Leicestershire	1650	987	663	50	2549.24	33	0.647	79
56 - Nottinghamshire	1727	913	814	44	2180.29	47	0.792	58
57 - Derbyshire	1845	1040	805	29	2625.13	29	0.703	72
58 - Cheshire	1780	1040	740	40	2742.34	27	0.649	78
59 - S Lancashire	2096	1053	1043	9	3041.03	18	0.689	74
60 - W Lancashire	1769	1083	686	42	1457.16	85	1.214	21
61 - SE Yorkshire	1641	981	660	52	3081.18	17	0.533	92
62 - NE Yorkshire	1859	1069	790	27	3332.13	13	0.558	89
63 - SW Yorkshire	1962	916	1046	17	3398.09	11	0.577	86
64 - MW Yorkshire	2036	1070	966	14	3531.83	8	0.576	87
65 - NW Yorkshire	1536	978	558	62	2399.93	39	0.640	82
66 - County Durham	1706	1043	663	46	2637.66	28	0.647	80
67 - S Northumberland	1621	1009	612	54	3496.2	9	0.464	97
68 - N Northumberland	1528	977	551	64	1756.85	70	0.870	53
69 - Westmorland	1834	1212	622	31=	2816.88	26	0.651	77
70 - Cumberland	1865	1146	719	26	4027.85	4	0.463	98
71 - Isle of Man	1485	680	805	66	582.35	108	2.550	5
72 - Dumfriesshire	1288	909	379	85	2834.87	25	0.454	100
73 - Kirkcudbrightshire	1487	977	510	65	2432.42	38	0.611	84
74 - Wigtownshire	1210	845	365	89	1320.63	88	0.916	46
75 - Ayrshire	1225	830	395	87	2958.99	21	0.414	101
76 - Renfrewshire	1140	693	447	94	651.78	106	1.749	10
77 - Lanarkshire	1644	779	865	51	2291.86	41	0.717	70
78 - Peeblesshire	952	644	308	103	921.63	101	1.033	32
79 - Selkirkshire	1105	635	470	95	658.66	105	1.678	11
80 - Roxburghshire	1393	761	632	77	1734.21	71	0.803	57
81 - Berwickshire	1346	810	536	80	1197.4	94	1.124	24
82 - E Lothian	1409	791	618	75	719.79	104	1.958	8
83 - Midlothian	1887	860	1027	25	949.01	99	1.988	7
84 - W Lothian	1203	675	528	90	325.8	112	3.692	1
85 - Fife & Kinross-shire	1612	855	757	56	1522.49	82	1.059	30
86 - Stirlingshire	956	713	243	101	1252.55	90	0.763	62
87 - W Perthshire	1253	872	381	86	1408.09	87	0.890	48
88 - M Perthshire	1391	1024	367	78	3653.19	6	0.381	103
89 - E Perthshire	1297	926	371	84	1790.81	68	0.724	68
90 - Angus	1558	1016	542	59	2290.2	43	0.680	75
91 - Kincardineshire	954	728	226	102	999.1	98	0.955	40
92 - S Aberdeenshire	1077	841	236	96	2895.81	24	0.372	104
93 - N Aberdeenshire	1069	720	349	98	2262.79	44	0.472	96
94 - Banffshire	1197	834	363	91	1585.43	79	0.755	63
95 - Moray	1484	832	652	67	1652.53	75	0.898	47
96 - Easternness	1381	920	461	79	4835.46	1	0.286	110
97 - Westernness	1191	895	296	92	4457.51	2	0.267	112
98 - Argyll (Main)	1302	945	357	83	3696.81	5	0.352	107
99 - Dunbartonshire	1443	837	606	70	614.87	107	2.347	6
100 - Clyde Islands	891	699	192	108=	580.5	109	1.535	13

Vice-county	No. of taxa	Native	Alien	Posn	Area Sq km	Posn	Ratio taxa/area	Posn
101 - Kintyre	1076	814	262	97	1222.84	91	0.880	50
102 - S Ebudes	1033	746	287	99=	1082.93	96	0.954	41
103 - M Ebudes	1033	764	269	99=	1119.56	95	0.923	45
104 - N Ebudes	896	730	166	107	1950.46	57	0.459	99
105 - Wester Ross	925	761	164	106	3359.57	12	0.275	111
106 - Easter Ross	1218	829	389	88	3274	14	0.372	105
107 - E Sutherland	891	682	209	108=	2453.13	36	0.363	106
108 - W Sutherland	932	779	153	105	3025.98	20	0.308	108
109 - Caithness	880	673	207	110	1807.45	65	0.487	94
110 - Outer Hebrides	938	722	216	104	3249.42	15	0.289	109
111 - Orkney	788	541	247	112	1080.23	97	0.729	67
112 - Shetland	852	473	379	111	1491.89	84	0.571	88
MEAN	1568.13	940.48	627.64		2080.97		0.955	
Channel Islands	1725	878	847		194		8.89	

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NOTES AND ARTICLES

SPOTTED ROCK-ROSE ON COLL

On 23 June 2004, Alison and John Hawcroft from Derbyshire, were walking along the north coast of Coll with Simon Wellock, the RSPB warden for the island, when they found what they believed to be *Tuberaria guttata* (Spotted Rock-rose). Simon contacted me as the BSBI recorder, and although I was slightly dubious at first, Tony Oliver's excellent digital photo (photo 2, colour section plate 1) showed it to be correct. What a nice surprise – a new plant for Scotland! It is growing in a typical west coast 'rock garden' patch with open soil patches and with *Antennaria dioica* (Mountain Everlasting), *Calluna vulgaris* (Heather), *Dactylorhiza maculata* (Heath Spotted-orchid) and *Erica cinerea* (Bell Heather) nearby.

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AN ANOMALOUS BUTTERCUP

Countless meadow buttercups grow in the fields of St Faith's County Park (grid reference TQ585938), a public open space managed by Brentwood Borough Council comprising about 30 hectares of rough grassland. In 2003 I came across a double form of *Ranunculus acris* (Meadow Buttercup) with perfectly formed, rosette flowers 12 to 16mm in diameter. It was no longer there in June 2004, but I had taken photographs (see photo 4, colour section, plate 1). It resembles the garden plant *Ranunculus acris* 'Flore Pleno', but its flowers are smaller.

The site was formerly St Faith's hospital farm but has not been under cultivation since the National Health Service started in 1948. Apart from a small patch of Dog's Mercury (*Mercurialis perennis*) in the northern boundary hedge there is no evidence of former woodland; in particular there are no

bluebells. A striking plant, growing in profusion on the spoil heaps left over from the construction of the car park for the BT offices, is Goat's-rue (*Galega officinalis*) with white and lilac flowers on separate plants. This is presumably a fodder plant left over from the days of the hospital farm. Another fodder plant, growing close to the Goat's-rue, is Sainfoin (*Onobrychis viciifolia*).

It seems likely that the double buttercup was a spontaneous variation and not an escape from garden cultivation. It grew in marshy ground about 100 metres from the spoil heaps and was surrounded by numerous perfectly normal meadow buttercups.

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REMOVAL OF *EPIPACTIS HELLEBORINE* POLLINIA BY *AGROSTIS* *CAPILLARIS*

Whilst visiting the local churchyard to do my annual check on the state of the *Epipactis helleborine* (Broad-leaved Helleborine) growing around some of the gravestones, I noticed that an *Agrostis capillaris* (Common Bent) growing in association with the orchid was bedecked with pollinia (see photo 3, colour section, plate 1). A gentle breeze was blowing causing the slender *Agrostis* to sweep across the more rigid *Epipactis* and thereby removing the pollinia which became firmly stuck to the grass. Ants were also observed busily farming the aphids that are ever present crawling over the plants. Last year I witnessed an ant with a pollinia firmly attached to its back and wondered whether this too could be another pollinator as well as the more usually accepted wasp.

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APPARENT CYCLIC VARIATIONS IN MEADOW AND CREEPING BUTTER- CUPS

Monitoring of hay meadows at Fryent Country Park, Middlesex (v.c. 21) has revealed an intriguing pattern of apparently cyclic variation in the frequencies of two perennial buttercup species that occur in the meadows, *Ranunculus acris* (Meadow Buttercup) and *R. repens* (Creeping Buttercup). The purpose of this article is to enquire if this effect is widespread, and whether the underlying causal factors are understood?

The meadows are on London Clay and are generally harvested for hay once annually in about July. In the few years when harvesting was not practicable, meadows were flail cut or left uncut. Monitoring of the flora of the meadows has been undertaken annually since 1985. Surveying of the meadows is usually undertaken in the second half of June, ahead of the hay harvesting. The core sample consists of 23 meadows, and the plant species frequency is estimated from ten, one metre square quadrats in each meadow, giving a usual sample size of 230.

The cycles appear to have durations ranging from five to nine years, and the cycles for the two species generally coincide. The effect is also subjectively noticeable at the landscape level: in 'good' years the meadows have a luxuriant yellow display for a couple of weeks in spring, whereas at the low point in a cycle the yellow is dispersed amongst the other vegetation. The cyclic pattern appears to be independent of variations in the management of the meadows or of NVC grassland types.

Crothers (1991) in reporting on the Nettlecombe grassland experiment in Somerset has previously highlighted similar cyclic variations in buttercups between 1968 and 1990. Furthermore, for the years in which the two investigations overlapped (1985-1990), the Somerset and Middlesex cycles were apparently in synchrony (Williams and Fowler 1997). Crothers was unable to obtain any consistent correlation in a comparison with meteorological data to explain the cycles. Sarukhan and Harper (1973) found that there appeared to be an element of density-regulation in populations of some buttercup species, albeit in a thirty-month study where individual plants were mapped and recorded every few weeks.

Recently the Middlesex team have chanced across a possible similarity between the buttercup cycles and variations in ...the quantity of spawn produced by the Common Frog. It is obviously unlikely that there is a direct causal relationship between the two. Nevertheless, if not coincidental, this could provide a clue to an underlying causal factor that affects both buttercup frequencies and the populations of the Common Frog. Indeed, the pattern may not actually be strictly cyclic but be a delayed response to environmental factors.

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HEDGEROW HAWTHORNS DISCOVERED

Those of us who live away from the Midlands know a hawthorn hedge when we see one and think we know that we are looking at *Crataegus monogyna*. It is not as easy as that! I was drawn to an un-trimmed and remarkably early-flowering hawthorn in a hedge near Berwick on 26 April last year and found its flowers to have two styles and its leaves to be little divided. It was *Crataegus laevigata* (Midland Hawthorn). Walking down the lane at home a little later when the first few hawthorns were coming into flower here I idly took my lens to them and soon found to my amazement that there were a couple of Midland Hawthorns and several hybrids, *C. × media*, in a very ordinary hedge that I had known for years.

None of these records were from my v.c. (Berwickshire) where I had only a few records of Midland Hawthorn, all as specimen planted trees, and none of the hybrid. So this May I made a dozen or so stops along the lanes of Berwickshire where I spotted early-flowering hawthorns. Most of these were *C. monogyna* but I came home with five records of the hybrid from four different hectads and one record of *C. laevigata*. There was nothing obviously special about the hedges where the hybrids were found but *C. laevigata* was associated with *Acer campestre* (Field Maple) near the entrance to a 'big house'.

Only then did I turn to my library to note in the *New Atlas* the widespread occurrence of the hybrid in Northern Ireland. Opening Paul Hackney's *Flora of the north-east of Ireland* I read of *C. × media* – 'The presence of this hybrid in some quantity in our hedges, most of which date from the second half of the nineteenth century, suggests that they were originally planted with quicks imported from nurseries in the southern half of England, rather than from native local stock. Recent hawthorn plantings alongside the M1 motorway were made using Dutch plants and are also either *C. laevigata* or the hybrid *C. media*'. It seems that those of us in the rest of Britain have been slow to learn from these observations.

Hackney also records the spread of hybrid hawthorns into natural habitats and if the hybrid is really as widespread away from the Midlands as seems likely we may be on the way to losing pure stock of *C. monogyna* in Britain as a whole. This could be a pointer to what is happening in other frequently planted species such as roses and those where the planted stock differs from native stock at varietal level or provenance rather than at specific level, such as ash.

Plant Crib 1998 includes a good note on the determination of *Crataegus*. In practice I simplify this by recording bushes with a mixture of one and two-styled flowers as the hybrid. Where I find two styles on all flowers I look at the leaves to decide whether I think I have the hybrid or *C. laevigata*. Some of the early-flowering bushes have one-styled flowers but leaves suggestive of *C. laevigata*. I avoid recording these plants as the wide leaf-shape variation in *C. monogyna* makes determination unsafe. Survey becomes impracticable once the flowering of *C. monogyna* gets under way, so there is

a window of about a week for *C. laevigata* and a few days only for the hybrid when this particular recording game may be played.

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CARDAMINE BULBIFERA IN HARROGATE

In April 1998 a small group from the Harrogate & District Naturalists' Society was botanising along the banks of Oak Beck in Harrogate. Large colonies of an unfamiliar plant were found, the most obvious characteristic of which was small bulbils in the leaf axils. This quickly led to its identification as Coralroot (*Cardamine bulbifera*) (although identification has still to be confirmed it is likely that it is *f. ptarmicifolia*). This led to some discussion as to its origin as it was well outside its normal range. Suspicion soon fell on the Northern Horticultural Society's garden at Harlow Carr which is upstream. It is known that the America Skunk-cabbage (*Lysichiton americanus*) escaped from Harlow Carr and is now common along the banks of Oak Beck.

Enquiries revealed that about 20 years ago small bulbils were found in peat used as packing for a consignment of lily bulbs from Essex. The peat found its way on to the gardens and *C. bulbifera* made its appearance. Some of the resulting plant material was then grubbed out and put on the garden tip adjacent to Oak Beck. It is reasonable to conclude that rain and occasional flooding over the years have carried bulbils downstream and led to quite extensive colonies at least 3 to 4 kilometres from the point of origin.

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Addendum

During April of this year a small quantity of *Cardamine bulbifera* was found (by KJW and CEP) growing in a separate locality circa 4 miles downstream from the Oak Beck populations. This site was on the north bank of the River Nidd close to Scotton Banks, Knaresborough (SE3302857754) where flood deposits had created a large sandy bank adjacent to the river. Here a few plants of *C. bulbifera* were growing in an open, 're-colonising' community dominated by *Mercurialis perennis* (Dog's Mercury), *Allium ursinum* (Ramsons), and *Aegopodium podagraria* (Ground-elder), with lesser amounts of *Alliaria petiolata* (Garlic Mustard), *Hyacinthoides non-scripta* (Bluebell), *Arum maculatum* (Lords-and-Ladies) and *Silene dioica* (Red Campion).

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HOWITT'S WILLOW COLLECTION

The article by Mark Woods (*BSBI News* 96:16) could be read as implying that Leaver Howitt's collection at Farndon dates only from the late 1950s. However, it was evidently well established at least by 1949, the year in which his membership of the BSBI came about as a result of a letter he wrote to one of the gardening weeklies, in which he asked if there was any way in which he could get a collection of living willows expertly named and was recommended to try this Society, of whose existence he had up to then been unaware (so he told some of us on the Lake District field meeting in 1953). It is possible that the collection goes back a good deal earlier than that, for I seem to recall that it came to him as an inheritance (from his father ?)

Some of the bushes that are now without a provenance are likely to be products of the BSBI field meeting at Southport in June 1954. The report of that (*Proceedings* 1: 543-546) mentions *Salix purpurea* × *S. repens* subsp. *argentea* and *S. purpurea* × *S. viminalis* as well as *S. purpurea* var. *helix* as among the taxa seen by the party on that occasion. 'Some possible triple hybrids' (p.545), which I was responsible for pointing out, intrigued Leaver and his wife in particular and I recall their taking cuttings of those for growing on at home. At the time they certainly thought the suggested origins needed taking seriously, but unfortunately I forgot to follow the matter up in later years.

Apart from his expertise in willows and refreshingly distinctive personality, Leaver Howitt deserves to be remembered for two notable botanical 'firsts' as well. To the best of my knowledge his *Flora of Nottinghamshire* is the sole instance to date of a county having had two such publications from successive members of the same family - for Dr Godfrey Howitt, the author of the *Flora* of 1839, was Leaver's great-uncle (or great-great-uncle: accounts differ). Equally, Leaver's marriage to a fellow field botanist in Lincolnshire, Brenda Chalk, seems to be the only known instance of an inter-vice-county union - as the result of an introduction, what is more, by Lincolnshire's Recorder.

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A YEAR IN THE LIFE OF *PRIMULA FARINOSA*, SOME COMPARISONS WITH *PRIMULA SCOTICA*, AND SOME PHENOLOGICAL PESSIMISM

Phenology (dealing with the influence of climate on the recurrence of annual biological phenomena) is becoming a 'hot topic' in view of the current process of global warming. The editor of *BSBI News* 94 (2003) included a note entitled '*Nature's Calendar*' indicating the revived interest in the subject. The Woodland Trust and the Centre for Ecology & Hydrology have established a UK Phenology Network which gathers and collates seasonal records of first flowering *events* of herbs and woody plants, and leaf colour change, leaf fall, and fruiting of trees and shrubs. Recorders 'will be contributing to over 300 years of observations and helping scientists and conservationists to understand the impact of climate change on our favourite plants and animals' (Isobel Lang quoted in UK Phenology Network's undated '*Guide to recording spring & autumn events in Nature's Calendar*'). However, modern meteorology will better demonstrate, and measure, rapid climate change than will a complex uncalibrated 'instrument' such as a plant occupying a multidimensional niche, involving other species. Any 'impact' on non-generalist species of progressive change in even a single climatic variable (an impossibility) is likely to be severe, not necessarily 'understood', and irredeemable. And, as Grace (1987) explained, it is unusual to be able to observe failure 'in action'.

The value of *Nature's calendar* will surely be as a means to an end - to keep public and political attention focused on a serious threat to the biosphere. For the species discussed below - the two British farinose primroses of the sub-genus *Aleuritia* - the calendar may, eventually, just record their progress to extinction in the wild. Plant migrations such as those that took place (despite - and because of - Pleistocene climate changes) to distribute non-invasive species around the world, are over. In the built and cultivated landscape of Britain, species already relict have no future: the periglacial landscapes with melt-water streams, and mires permitting the *Primula* migrations, through their copious seeding, will not return, and the influence of *Homo sapiens* is overwhelming.

The emphasis, on plants, in *Nature's Calendar* is on abundant and easily recognised species whose seasonal changes in appearance are well known. What may be observed in the short term is natural history related to weather rather than climate, and reveals something of the plasticity of a given species - a plasticity with limits that may eventually be reached catastrophically. Grace (1987) suggested that distribution patterns of species are probably determined by failure at one part of the life-cycle caused by extremes of climate - either extreme values of specific variables, or unusual combinations which collectively uncouple the usual relationships between different parts of the life-cycle. Progressive, unidirectional changes in the weather at a given latitude, must thus be expected to thwart, eventually, vegetative and reproductive processes locked into daylength for millennia.

Most records suggested in *Nature's Calendar*, are spring and autumn *events* – budburst, first flower, first and full [autumnal] tint of leaves, and the beginning of autumn leaf fall. Each event portends a *phase* in the existence of the plant: for example autumnal colouration of deciduous trees and shrubs lasts while metabolites are translocated from leaves for conservation elsewhere in the plant. The remark of Walter (1979) seems pertinent: 'The factor responsible for setting off the change in colour of the leaves in autumn, even before the first frost occurs is unknown. It may partly be decreasing daylength'. The survival value of the deciduous 'strategy' for woody dicotyledons in temperate climates is evidenced by its ubiquity. Should climate change eventually thwart it in Britain considerable changes in the vegetation are inevitable, observable, but unstoppable.

Such an autumnal senescence phase was evident in *Primula farinosa* in Wharfedale, Yorkshire in 2003, but this aspect of its phenology seems not to have attracted notice, and its survival 'value' is, as yet unknown. Yellowing of the smallest early leaves of a rosette, shaded out by later growth, occurs throughout the summer, but the autumnal phase, when all expanded leaves are changing, might be more important to the persistence of a genet (an individual 'plant' grown from a sexually-produced seed) – with consequent effects on its ability to produce some hundreds of seeds (the only vehicle for dispersal, and the major means of reproduction) in the following year(s). The importance of high longevity to survival of *P. farinosa* has been indicated by Bradshaw (1978).

Recognition of the duration, and the maximum, of any seasonal phase for a perennial herbaceous species, both under cultivation and in the field, might usefully increase understanding of its ecology, and its 'strategy' (*sensu* Grime 1979). Here relevant observations on the natural history of *Primula farinosa* are presented, and photographs illustrate some key phases. Such phases are subjectively recognised; some merge or overlap, and each shows progression to a peak or plateau: for example, progress of a vegetative phase is towards a maximum *net* number of green expanded leaves per genet, followed by a reduction in this number through the phase of leaf-senescence discussed above. Should climate change invoke persistent reduction or eventual loss of this ability to conserve materials, by causing premature death of expanded green leaves, through either summer drought (see below) or damage by early frosts, the survivability of the species could be compromised.

If the ability of a species to complete a given phase, such as flowering, is genetically coupled to daylength, it will be compromised by progressive year-on-year alterations in the weather at a given latitude. Unfortunately, interpretation of quantitative field observations (intended to shed light on *relatively* gradual climate change) must be hampered by the 'noise', sometimes lasting for years, caused by stochastic weather events. An example illustrating effects of weather rather than climate on the flowering of *Primula scotica* is provided by Bullard *et al.* (1987): in Orkney, summer gales and low temperatures in May and August were shown to reduce [the amount of] flowering of *Primula scotica* in the *following* year. Should such weather become the norm (*i.e.* a real climate change) a terminal decline of *P. scotica* must be expected – it can hardly spread further north!

The relative timing of the flowering phase of each of the two British *Aleuritia* primroses under cultivation in Bradford (latitude 53°47' N) has remained predictable in an experiment over five years - with *P. scotica* always in advance, but sometimes producing new inflorescences over a longer period. Expressions of their inherited ability to sometimes split the flowering phase into more than one peak, and for occasional flowers to persist overlong, are undoubtedly linked to weather, and to microclimate. A disability recorded by Bullard (1976) of garden raised plants of *Primula scotica* – they 'flower themselves to death' – may also be related to a garden microclimate which jeopardizes the optimum timing of vegetative and flowering phases.

A key effect of climate change on the survival prospects of either primrose, wild, in Britain must involve alterations in (weather mediated) soil hydrology. A marked propensity for *P. farinosa* to occur in damp soil on north-facing hillsides in England suggests that soil water regime is of great importance. Although recovery, in autumn, of plants growing in black peaty soil which were 'dwarfed and almost shrivelled-up' in summer was recorded by McWatt (1923), such recovery does not always occur, and the autumnal leaf-yellowing phase is lost. Year-on-year repetitions of summer water-stress, and a reduction of recovery time, might be envisaged as potential, local outcomes of climate change unfavourable to *Primula farinosa*. The most vulnerable phase in the existence of a *Primula* genet is, of

course, the seedling phase (*P. scotica* illustrated by Ritchie (1954)*P. farinosa* illustrated by Hambler & Dixon (2003)) it is difficult to observe in the field, but climate changes affecting soil hydrology might be expected to influence the performance of seedlings at any one site.

Photographs (see colour section, plate 3) illustrate the history, in 2003, of a single shoot of *P. farinosa* sited on a vertical cliff in Wharfedale, North Yorkshire; the liverwort *Preissia quadrata*, and leaves of *Sesleria albicans* are also evident, as is a shoot of *Pinguicula vulgaris* whose spatial development suggests temporal interlocking rather than competition with that of the *Primula*. 'Phases' may be recognized as follows. The overwintering dormant phase is represented by the silver-farinose bulb (a 'modified [apical] bud - usually underground' (Hutchinson 1948)) with leaves imbricate to their tips shown in photo 1 (13 March). This monaxial 'plant', on a vertical surface, is partly shielded by its own litter of rotten and dried leaves. It is probably in its second year of existence as no old scape is present to provide evidence of previous flowering. The beginning of the leafy vegetative phase (photo 2, 9 May) is characterised by the expansion of the outer sheathing leaves of the bulb, which morph into apetiolate-spathulate-rounded entirely farinose (unless exposed to the weather) foliage leaves, followed by an initial *net* increase in leaf - number per genet until late July. New ramets may become evident after flowering, arising among the leaves of a rosette above the origin of any scape. Such ramets are initially part of 'the plant' (best defined as a genet), but they may progress to independence by the next growing season.

There is an eventual reduction in the number of 'active' leaves of a genet; as daylength decreases: the upper surfaces of exposed leaves become glossy and each leafy ramet may morph into a bulb through inactivation of its mature leaves (a genet, photo 3, 19 September) illustrates this phase.

The flowering phase (photo 3, 5 June) is represented here by a fully flowering rosette with one axillary, green entirely farinose, continually elongating scape; the leaves (some original bulb leaves) are all expanded and spatulate, their upper surfaces, now, with little or no farina. In the post-flowering phase (photo 4, 7 July) the flowers are over, but corollas are still attached and each calyx is becoming papery; the scape continues to elongate during this phase, and the density of the farina is thereby reduced; farina is now absent (removed by weathering) from adaxial surfaces of expanded leaves.

In the fruit maturation phase (photo 5, 19 September) the capsules become brown and shiny, and emergent from the calyxes and dehisce apically; the scape itself has become rigid, changing colour through yellow, to brown and shiny. In the senescent phase (photo 6, 10 November) the oldest leaves have rotted, the fully expanded leaves become shiny above, and are now bright yellow; the youngest leaves are imbricate and unexpanded and form the winter bulb which is entirely, and very densely, white farinose. The yellow leaves will change to dry litter, whilst the dead scape will become grey, and retain still seed-rich erect capsules through winter. The plant photographed remained as a single rosette throughout 2003, presumably retaining a single apical shoot meristem but new ramets became evident in 2004.

The phase of seed retention and shedding can be a very long one in both primroses, lasting into a subsequent growing season; the retention of some seeds, dry within capsules, could well be an important survival strategy for both species, with seeds available to exploit gaps over a long period.

A phase of adventitious root initiation and elongation reaches a maximum in late summer and autumn, and thick, white roots initiated by a ramet may persist for more than one year. Arching, recently produced, white adventitious roots are evident in the photograph showing the late vegetative phase.

In conclusion I would suggest that the kinds of *phase* observations, quantified and illustrated by an entirely notional graph (Fig. 1), might add a different dimension to the generality of seasonal phytometric recording in which phenological events may be, at first, related only to weather rather than to climatic trends. Careful observation of a given herbaceous species over a number of years at a given latitude, and *reference to meteorological data*, will enhance knowledge of its natural history, and might suggest which of its characteristic phases are likely to be most adversely affected by a given climatic trend. Nationally scarce, and endangered, perennial herbs, such as *Primula farinosa* and *P. scotica*, seem entirely appropriate for this attention, although the scope for conservationists to mitigate a climate-driven decline is non-existent.

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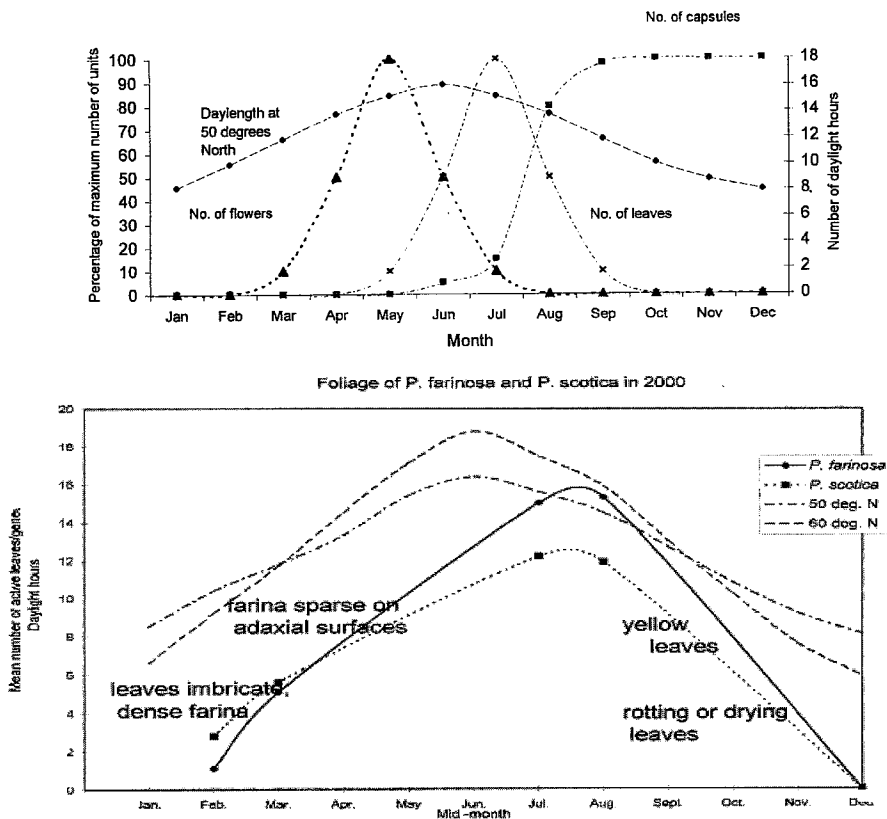


Fig. 1. (a) Notional graph showing some phases of a *Primula* species in relation to daylength. Percentages refer to the mean maximum (100%) number of leaves, flowers, etc., attained by a sample of clones in a year. Drawn by Dr Louise Hurley. (b) Vegetative phase of *Primula farinosa* and *P. scotica* cultivated (in pots) together at 54°47' N, with indications of daylength.

POLYPODIUM CAMBRICUM IN THE NEW FOREST

Polypodium cambricum was recorded growing as an epiphyte on oak (*Quercus robur*) from only two sites in the New Forest when *The Flora of Hampshire* went to press in 1996. It was also known from four sites in South Hants. growing on the ruins of medieval buildings at Beaulieu and Netley Abbey and at Christchurch. Since then it has been also found at Bishop's Waltham.

In 1997 Paul Bowman and I both found a further colony at Whitley Wood and it was while looking to see if this *P. cambricum* was still there in November 2002 that I found a number of other Polypodies which looked like good candidates for *P. cambricum*. Further searching in the same general area produced many more that appeared, superficially, to be broader in frond outline than *P. interjectum* which is the commonest Polypody in the south of the Forest.

Most of these plants were impossible to reach and because there appeared to be so many I assumed that I must be mistaken; so many could surely not have been missed in this highly botanised Forest. A very dry spring in 2003 put an end to Polyhunting and an equally dry autumn delayed the start. By this time I had the help of Robin Walls and then Martin Rand, long-handled pruners and some keen climbers to obtain specimens for identification. Robin did sterling work measuring the fronds and pinnae and we all looked at dozens of rhizome scales and frond outlines, hundreds of sporangia and spores. The indurated cells in the sporangia were counted, measured and compared. These features, together with the number and colour of the annulus cells, the presence or absence of branched paraphyses in the sori, and the number of basal cells to each sporangium are given as diagnostic characters when determining whether a Polypody is *P. interjectum* or *P. cambricum* by Jermy, Camus & Page. However, only the presence or absence of branched paraphyses and the number of indurated cells and basal cells in the sporangium (though variable) seem to be reliably useful.

Samples were sent to Rob Cooke, the referee, who confirmed most as *P. cambricum* and two as *P. × shivasiae*, the hybrid with *P. interjectum*.

In all there seem to be about thirty colonies of *P. cambricum* all growing on *Quercus robur* with the exception of one small plant on Field Maple – *Acer campestre*.

The biggest puzzle is why do the epiphytic plants appear to require sheltered, damp woods with low light levels when the plants growing on limestone ruins nearby can tolerate a situation exposed to the full force of the sun and wind?

Why do the fronds of *P. cambricum* in this situation appear identical in colour and texture to *P. interjectum* when the difference is stressed by Page?

P. cambricum has now been found in 5 distinct areas of ancient woodland all of which was extant in the 18th century or earlier. The typical conditions are in sheltered, mixed woodland with a damp floor on the basic clays which are found in the south of the New Forest. All but the first, found by George Peterken (this colony still exists), are within the mild band of climate which is found within a few miles of the Solent.

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IT'S NO LAUGHING MATTER! – BOTANY VS. HAY FEVER

Having read of Phil Budd's troubles with 'hay-fever' (*Personal observations on pollen allergy – BSBI News 96*), I decided to write in. I have suffered from hay-fever since the age of 8. However, I have been interested in botany since the age of 6, when I just had to identify what the flowers were that I saw when out on walks with my countryside-loving parents (sometimes much to their consternation after spectacular tantrums, when my Collins Gem Guide didn't include the flower I had seen!).

I started to take medication for hay-fever when I reached my early teens and I continue to take it now at age 26. I take anti-histamine tablets, steroid nasal sprays, eye-drops and an inhaler (I do get wheezy at the height of the pollen season). But whenever I go to my local surgery to get a prescription, there is invariably a new doctor that I get to see and they always dutifully run off a long prescription and then out of interest, they ask me what I do for a living. It's then that the laughing starts! After the doctor has dispensed with the advice not to venture outside when the pollen is high I

then explain that I must be a botanist because that's when the plants are growing and flowering and therefore can be identified easier. All I get then is 'good luck'.

Like Phil, I don't seem to suffer as badly with dense woodland habitats or heath habitats and I try to take my annual holidays near the coast (normally Cornwall). My symptoms start in mid-April and last until late-August with the worst month being June. I was interested to read that Phil finds *Holcus lanatus* to be one of the main culprits. I have found that *Arrhenatherum elatius* is the worst trigger for my symptoms. Indeed I do suffer during and after a walk through a field of *H. lanatus* and other meadow grasses but I suffer worse symptoms with *A. elatius* including skin rashes. Maybe it's because of the height of *A. elatius* and that the pollen cloud which is released with every slight breeze from this elegant grass can be up to (my) chest/neck height. Another plant that does get me if I get close enough is *Crataegus monogyna* in flower. I do carry out hedgerow assessments and have found that one whiff of this sweet-smelling shrub reduces me to fits of sneezing. However, I don't seem to suffer too badly from tree pollen.

I frequently wear a mask in the field which really helps. This is just an ordinary dust mask – I have been offered full chemical attack masks but I wonder how comfortable they would be on a hot day. Plus I get strange looks from passing members of the public when I'm only wearing my small dust mask – I hate to think what people would assume if they saw me on their local greenspace with one of those huge gas masks!

But I will never give up botany even though I get ill for a few weeks of the year. I just cannot stay indoors with the windows shut when I know that out there somewhere is a species-list to be made and a square to be bashed!

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MORE PLANTS AT VARIANCE WITH FLORAS

Ranunculus hederaceus

Floras use the reflexing or not of sepals as a recognition point, and say of this species 'sepals not reflexed'.

The truth is more complicated. Examination has shown that when a flower is fresh its sepals are close under the petals. But as it ages the sepals first become patent, and then turn down, and later drop off. There is of course a difference between turning down and reflexing, because the latter involves the sepals kinking, but that is a subtle point.

The silhouette below shows examples of downturned sepals, arrowed. (The petals being white do not show up on a copier-produced silhouette).

I am indebted to David White for drawing my attention to flowers of this species with downturned sepals.



VIOLET AND WHITE PANSIES

I have been given a new digital camera and have been trying out its settings on the huge palette of pansy colours to be seen at the moment.

Mentioning this to my father, he pointed out that some of the fancy ones in his garden had more than one flower type on a plant. I thought he had probably been given plants that were very closely intertwined, but, when I looked in my own garden, I found at least one self-sown plant that did, indeed, have both white and mauve flowers on the same stem (see photo 1, colour section plate 1).

Further observations on the pansies (*Viola ×wittrockiana*) have led me to offer a partial explanation. The effect is most pronounced in the paler violet colour flowered plants, though I think it also occurs on the paler parts of flowers on other colour combination plants also. On the former, in my plants at least, it seems that the flowers can be either violet or white coloured in the early stages but then on exposure to – presumably UV – light the ‘white’ colours are gradually ‘exposed’ and become violet.

I do have other plants where the flowers are all white and stay that way, so it seems possible that either, one of the colourants in Pansies is a light sensitive one and its effects are only observable if they are not masked by the more permanent darker purples and yellows, or: perhaps, that the plants have a limited capacity to make the pale violet colour and can only manage to ‘colour in’ one flower at a time, and do so more quickly in stronger light.

I would be interested to know what are the factors controlling pansy flower colour and why it is so variable: and how can colour genes be expressed differently in two flowers, side by side, on the same plant? I would expect somebody in the readership has already looked into this and would like to explain it to the rest of us!

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SCARBOROUGH MUSEUM HERBARIUM *REDIVIVUS*

In 1998 Scarborough Borough Council was awarded a grant from the Heritage Lottery Fund to facilitate the curation, conservation and documentation of their natural history collections. Liverpool Museum was awarded a contract for work on the botanical part of the collection, and following close liaison with Douglas Russell, project officer and temporary natural history curator at Londesborough Lodge, the work was carried out in Liverpool from 1999 to 2004.

Published information on the content of the herbarium was hitherto scanty; the purpose of this note is to highlight some of the more sizeable collections and to give a brief assessment of their importance. Further information should be sought from the Museums & Gallery Officer, Jane Mee.

The Walter W. Reeves herbarium. 5,270 sheets. Reeves (1819-1892) was a noted microscopist based in Surrey, who was one of the founders of the Quekett Club and served as assistant secretary of the Royal Microscopical Society from 1868 to 1884. In retirement he moved to Pickering, in North Yorkshire, and hence his herbarium was deposited in Scarborough Museum. It accounts for 50% of the Museum’s botanical holdings and is notable for its coverage of the flora of Surrey. It also contains interesting voucher material from the Howardian Hills, including a few local specimens collected by the eminent Yorkshire explorer Richard Spruce. Overall, it is one of the major British herbaria of the late 1800s and is comparable in coverage, if not in its content of critically named microspecies, with that of W.R. Linton. Table 1 lists the principal collectors, including Reeves’ co-collectors. It has been expertly conserved and remounted by Karen Backhouse, who also databased the majority of the specimen records.

The M.B. Slater herbarium. This consists of Bryophyte *exsiccatae*, one with 583 specimens collected by Slater himself and another totalling 551 specimens which includes B. Carrington & W.H. Pearson’s *Hepaticae Britannicae Exsiccatae*, a bound set of 200 British liverworts. This contains a few specimens collected by Slater, and is also of taxonomic importance as Carrington’s material included type specimens.

The Scarborough Boy’s High School herbarium. 884 plant specimens and 59 lichens. The compiler of this herbarium is unknown, despite the fact that the labels are written in a rather distinctive

hand. Many of the specimens come from Nottinghamshire, Derbyshire and Lincolnshire, suggesting that the collector may have been based somewhere near Ockbrook or Grantham. It also contains specimens from named collectors, notably 'Mr Hardy', E.S. Ridge, G. Ridge (including lichens) and Miss E. A. Woolley (England), and W. Gardiner (Scotland).

The T.S. Bedford herbarium. 579 specimens. Bedford, who was active in the late 19th century, compiled a herbarium from both his own collections (mainly from Yorkshire) and from others such as J.H. Tiffen (mainly from Cirencester, with a few from E. Yorkshire). Dates range from 1850 to 1884.

The L.B. Hall herbarium. 537 specimens. Laurette Bunty Hall, whose biography is unknown, compiled a set of 5 books of mostly unlocalised flowering plants. A few which have locality data, such as Hampstead (1951), Cotswolds (1954) and Dijon (no date) give scant information as to the sources of the collection, but it appears to be largely English.

Rev. W.S. Hore herbarium. 225 specimens. A collection of unlocalised marine algae; William Strong Hore (1807-1882) lived in Devon and was a correspondent of W.H. Harvey. The main part of his collection was destroyed by bombing during the second world war, making this surviving fragment of particular interest.

Smaller collections [numbers in brackets]. These include the F.J. Thompson herbarium [212], a 1960s Yorkshire collection ranging from Ayton to Spurn Point; an interesting collection of boxed pharmaceutical samples [200] from Harold M. Hirst; the D.H. Smith lichen herbarium [157], mainly from N. Yorkshire; a bound volume of pressed flowers titled 'Souvenir des Eaux Bonnes, Botanique' and thus presumably French, donated by James W. Craig; the Edward R. Cross herbarium [147], mainly from the Scarborough area but also Bristol and Bath; unlocalised seaweeds from Georgina Wise [70], donated by the Scarborough Field Naturalists' Society; the Emily Harrison herbarium [42], partly of Yorkshire provenance, donated by the Malton Naturalist & Scientific Society; the Sidney Pollard herbarium [37], 1960s and 19th century, mainly from Cloughton; the Silvanus Thompson fern herbarium [24] from the neighbourhood of Hutton Buscel; the J.A. Martindale lichen herbarium [16] from the Lake District; and D.J. Price's seaweeds [9] from the Isle of Man.

Table 1. Collectors in the Walter Reeves herbarium (co-collectors starred).

Allen, Mr; 1879-81; various localities	Fryer, A.; 1883-89; Cambridgeshire, Huntingdonshire
Andrews, G.; 1841-45; Ireland: Clare, Kerry & Sligo	*Glasspoole, H.G.; 1874-86; Norfolk
Bailey, C.; 1875-87; various	Grant, J.F.; 1882-87; Caithness
Baker, J.G.; 1878-84; mainly Kew	*Griffith, J.E.; 1882-90; N. Wales
Balfour, J.H.; 1844; Scotland	Groves, H.; 1874-89; mainly Surrey and Hampshire
Beeby, W.H.; 1872-89; mainly Surrey, Shetland	Groves, J.; 1881-90; mainly Essex, Kent, Perthshire
*Bennett, A.; 1873-89; mainly Surrey, E. Anglia	*Hanbury, F.J.; 1878-87; various
Boswell, J.T. (late Syme); 1874-83; Scotland, mainly Perthshire, Fife, Orkney	Holmes, E.M.; 1873-88; mainly Devon
*Briggs, T.R.A.; 1875-81; Devon, Cornwall	Jackson, B.D.; 1875; Forfar
Bromwich, H.; 1880-86; Warwickshire	Johnston, H.H.; 1878-84; Scotland
Brotherston, A.; 1875-77; Roxburgh	King, F.C.; 1880-88; mainly Lancashire
Burton, J.W.; 1875-77; Wirral, Cheshire	Kirk, K.; 1873-77; Switzerland
Craig-Christie, A.; 1878-80; Scotland	Kirkby, Mr; 1879-87; W. Yorkshire
Croall, A.; 1840-82; Scotland	Lees, A.; 1870-81; various
Cunnack, J.; 1872-82; Cornwall	Lees, F.A.; 1871-80; mainly Yorkshire
Curnow, W.; 1876-90; Cornwall, Devon	*Ley, Rev. A.; 1872-89; mainly Herefordshire, Wales
Davidson, A.; 1883-87; Dumfries, Caithness	Linton, Rev. E.F.; 1878-89; mainly Norfolk
Dawber, L.; 1880-90; Guernsey	Linton, Rev. W.R.; 1872-89; Various
De Crespigny, E.; 1878-88; Essex, Kent, Surrey	Lister, J.; 1887-89; Norfolk
Dod, Rev. Wolley; 1882-84; North Wales	Lomax, A.E.; 1879-87; various, mainly Cheshire, Kerry, Perthshire
*Dowson, Dr; 1876-78; mainly Surrey	Lomax, Mrs E.A.; 1875-87; Various
Druce, G.C.; 1871-88; various	*Marshall, E.S.; 1886-89; mainly Surrey, Scotland
Ewing, P.; 1882-89; Forfar, Perthshire, Strathclyde	Marshall, J.J.; 1888-92; N. Yorkshire
Foggitt, T.J. & Mrs J.; 1875-77; N. Yorkshire	Meldrum, R.H.; 1887-90; Perthshire
Fox, H.E.; 1877-86; Durham, Northumberland, Scotland	Melville, J.E.; 1873-88; various
Fraser, J.; 1874-88; Staffordshire	Mennell, H.T.; 1880-89; various
	Millar, D.J.; 1883; Cumberland

- Miller, W.F.; 1883-89; Scotland
 Mobong, Rev. T.; 1880-81; Massachusetts, USA
 Moiser, H.R.; 1879; N. Yorkshire
 Newbould, Rev. W.W.; 1871-1881; Cambridgeshire, Kent
 *Nicholson, G.; 1877-95; mainly Surrey
 Oakeshott, Mrs H.M.; 1875-1888; various
 Parsons, Dr H.F.; 1882-83; Channel Isles
 Piquet, Mons. F.; 1863-86; Jersey
 Powrie, D.J.; 1877; mainly Forfar
 Praeger, R.L.; 1886; N. Ireland
 Preston, A.W.; 1879-1889; mainly Norfolk
 Purchas, W.H.; 1879-1887; various
 Reed, J.W.; 1883; Cumbria
 Reeves, Miss; 1882; Sussex
 Reeves, W.W. & co-collectors (marked *); 1874-88; various
 Rogers, Rev. W.M.; 1873-87; S.W. England
 *Roper, F.C.S.; 1876-1883; various
 Salmon, J.D.; 1842-46; Surrey
 Scully, R.W.; 1887-1890; Ireland
 Searle, H.; 1883-84; Lancashire, Cheshire
 Slater, Rev. H.H.; 1872-1880; various
 *Slater, M.B.; 1881-93; mainly N. Yorkshire
 Soutter, J.P.; 1878-80; Co. Durham
 Spruce, R.; 1848-89; N. Yorkshire
 Steuart, Capt. J.H.A.; 1884-89; mainly Isle of Wight
 Straker, E.; 1880-85; Surrey
 Sturrock, A.; 1880-84; mainly Perthshire
 Syme, J.T.; 1848-80; Scotland
 Tatham, J.; 1840; W. Yorkshire
 Tatum, E.J.; 1889-90; Wiltshire
 Thwaites, G.H.K.; 1842-43; Somerset
 Towndrow, R.F.; 1885-88; Worcestershire
 Townsend, F.; 1861-1880; various
 *Trimen, Dr [H.?]; 1877-83; Hampshire
 Tugwell, W.H.; 1876-86; mainly Scotland
 *Turner, Rev. W.N.; 1877-83; mainly N. Yorkshire
 *Ward, F.H.; 1875-87; mainly Surrey
 Waterfall, W.B.; 1878-87; various
 Watkins, B.M.; 1876-80; mainly Herefordshire
 Watson, H.C.; 1832-80; various
 WaU, L.; 1885-87; Dumbartonshire
 Webster, G.; 1877-84; mainly Yorkshire
 Wheldon, J.A.; 1881-89; N. Yorkshire
 White, Mrs C.F.; 1876-77; Oxfordshire
 White, F.B.; 1871-89; Scotland
 White, J.W.; 1884-89; Somerset
 Winslow, Dr A.P.; 1877-81; Sweden
 Wollaston, G.B.; 1870-87; mainly Kent
 Wood, J.; 1882-83; Yorkshire
 Woodward, S.P.; 1835-48; mainly Gloucestershire
 Young, J.F.; 1839-42; various

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SKYES THE LIMIT – AN *ARABIS* SAGA

From my first interest in mountain flowers, the mystique surrounding *Arabis alpina* (Alpine Rock-cress) at its sole isolated British locality, a single corrie of the Cuillin Mountains on the Isle of Skye, has always been a source of much fascination. The accounts of its discovery by H.C. Hart in 1887 on his honeymoon, together with the evocative description in Raven & Walters (1956), served to arouse and sustain my interest for some thirty years. Whilst it is well known that its locality lies in a rocky cleft high in a corrie above Glen Brittle, many have searched to no avail; the Cuillins are rough, savage and uncompromising mountains affording few other botanical distractions to soften the slog up the endless mobile scree to the crags above.

It must be stated that my interest in plants, *A. alpina* being no exception, is twofold; the inherent pleasure in seeing them as well as to gain some insight into its ecology through seeing it in its natural habitat. Whilst plants are interesting for their own sake, how much more interesting they are as a component in a functioning dynamic habitat. In addition, how many botanists have found new localities for plants after having seen them at recognised sites only weeks before?

So why is *A. alpina* so rare and restricted in distribution in Britain and yet so widespread across Europe? Seeing the plant in the Alps served only to increase my interest, particularly when I first found it as a 'weed' on railway ballast at Kleine Scheidegg.

Fate works in strange ways; many years elapsed before I was able to visit Skye at the right time of year, finding another botanical friend to accompany me (for safety) proved difficult, as few seemed to share my enthusiasm.

In 1992 a short trip to Skye saw me clambering high in a particular corrie, only to be rained off by a storm that turned the cliff faces into waterfalls. As the plant is said to grow under an overhanging cliff, there is only so much water one can get down the back of one's neck before becoming thoroughly despondent and depressed. At such times mountain corries appear vast and the task enormous. The locals who invariably say 'you should have been here last week the weather was lovely, we had blue sky

every day', tend to make such failures even worse. None-the-less the section of the corrie I had searching appeared to be the most promising.

Time elapsed and my next effort was in 2002, this time with precise directions! Despite two days of search in the most hostile environment anyone could contrive for a plant, we failed. That is not to say *Saxifraga nivalis* (Alpine Saxifrage), *Saxifraga oppositifolia* (Purple Saxifrage) and *Cerastium arcticum* (Arctic Mouse-ear) were not a pleasure to see. Descending the mountains in glorious weather, with the early evening light casting the cliffs into deep relief, was enough to convince me that we would have been better to trust my instincts and continue where I had broken-off on the earlier trip. This I decided to do in 2003.

In the event my companion of 2002 was unwell and the trip was cancelled. Fortunately correspondence with Ian Green earlier in the year led to a joint trip in July – later in the year than I had intended. Ian had been contracted by Scottish Natural Heritage to assess the status of several rare species in the Cuillins, including *A. alpina*. Ian would be undertaking his fieldwork Monday to Friday and my wife had allowed me to 'play-out' over the same period. However, travelling from Lancashire I doubted even with an early departure that I could meet Ian on the first day. Arrangements were made to make telephone contact en route to review progress. In the event an early night lead to waking at two in the morning, and after a restless half an hour, a decision was made to set off there and then – more importantly I was keeping my wife awake! Words to the affect of 'get back to sleep or go' were uttered. By 8 pm the phone call came from Ian, 'I'm at Fort William where are you?' as it happened I was forty miles south at Bridge of Orchy. After an initial meeting at Broadford, for domestic arrangements, we met again in Glen Brittle – make the most of the good weather it may not last! 1.30 pm saw us crossing Glen Brittle, it gave me much comfort that Ian's grid reference matched my notion of where to look – although I have always found grid references on cliff faces somewhat problematic.

Working our way below the crags from where I had left off eleven years earlier, in an overhanging gully some five metres above was a plant that looked to have long narrow fruits. I cannot remember the scramble but there it was after thirty years, as a bonus one plant still in flower even in mid July. The time was 4 pm, when I departed home I had not expected to achieve my goal by the afternoon. For the rest of the afternoon, as required by SNH, we counted the population and continued to survey the corrie for other specified species.

Two days later we met again to survey two one-kilometre squares in another part of the Cuillin Mountains. First stop was, however, to buy sun cream – on Skye! The temperatures at 10 am had reached 28°C, so it was a slow and tedious climb to the heights. At one point I wondered what I was doing, after all Ian was working and I was doing this for fun! Eventually we reached the high cliffs and explored the first gully, from my point of view more to get some shade. It was not very productive and rather difficult, once up, to descend. At the second gully I suggested that Ian should climb up and I would stay below for safety reasons – age and all that. Ian did and soon found *Saxifraga nivalis* (Alpine Saxifrage), *Cerastium arcticum* (Arctic Mouse-ear) and *Draba norvegica* (Rock Whitlowgrass). The latter I had not seen for many years, so I climbed too. Being the optimistic sort, I had light heartedly said to Ian to look for *Arabis alpina*, the overhang higher in the gully looked eminently suitable – none was found. The *D. norvegica* seen and photographed, I descended, leaving Ian counting populations. But then as I carefully picked my way down, there in open habitat beneath the cliffs, amongst *Alchemilla filicaulis* (Hairy Lady's-mantle), was a clump of *Arabis alpina*. Ian was down in seconds, we could hardly believe our eyes and our luck, we were in a corrie about 2km from the classic site. If this was why fate had had me waiting thirty years, it was well worth the wait. (See photos, p. 34).

Back to ecology, have I gleaned anything into the species requirements and why the plant is so restricted in Britain? The new site offers the opportunity to make comparison. In most respects the new site is similar to that above Glen Brittle, the substrate is moist fine stone and grit and in many respects that found in glacial moraines in the Alps. However, the new locality is slightly better illuminated, as it appears to get a little direct sunlight, unlike the classic site. This, it is assumed, accounts for the healthy clump of *Alchemilla filicaulis*. In common with other mountain plants competition is undoubtedly a factor that restricts the plant to the open habitat found in gullies. Elsewhere the fine stony grit would soon be colonised by other more vigorous species or be eroded and lost in the block screens below.

Whilst the substrate is unstable at both localities, it is stable enough for colonies to be established. As both colonies appear to be regenerating freely from seed, the species is able to behave like a colonist or, dare I say it, a casual and take advantage of the open ground. However, open habitat in such situations is not infrequently met in most British mountains, so what makes Skye so special? The reasons may be purely chance, just as *Lloydia serotina* (Snowdon Lily) is restricted in Britain to North Wales. Yet, if I may speculate, the habitat of *Arabis alpina* is somewhat different, if only subtly so. The bare inhospitable screes of the Cuillins provide the moist competition-free habitat at a lower altitude than on many other British mountains. Given the relatively wet mild climate of Skye, the species has a longer growing season than would be available in the central highlands, where such gullies may remain snow filled later in the year. The infertile shady conditions may result in a slow growth rate; the season on other mountains may be just too short. This may be coupled with the possibility that *A. alpina*, whilst a perennial, may be relatively short-lived. Our observation of many seedlings points to this. A run of short seasons and bad weather in the central highlands could see no regeneration and populations becoming moribund.

We must also consider the impact of grazing. Over the years I have witnessed the extension of screes through over grazing – the loss of sparse vegetation resulting in the fine grit and soil components being washed outleaving the bare stone screes. Is this a historic scenario on the Cuillins, was *A. alpina* once found on open habitat beneath the gullies? I can imagine *A. alpina* being very vulnerable to sheep grazing. By our observations plants had certainly been attacked by slugs, the plant at the new locality had suffered partial loss of some of its fruits.

Where I have seen *A. alpina* in Europe it has generally been in the open, on stony habitat, often associated with glacial moraines or below snow patches where there is below ground water seepage. Such habitats generally suffer little grazing pressure.

As for conservation, at both sites seed production appeared good and the populations seemed to be quite viable with seedlings present. However, the habitat is extremely vulnerable, fine stone or grit accumulated in sheltered conditions supported by large unstable screes. Significant movement of these supporting screes, either through natural processes or recreational pressures, would inevitably result in the erosion of the fine material in which the plant grows. This must be the main threat to the British *A. alpina* population.

In terms of its localities, the past and current situation is unclear. H.C. Hart (in his letter in Kew) states, 'gathered in three distinct places in the north of the Cuillin range', whilst Francis Druce apparently claimed to have found it in another site. (T. Rich *pers. comm.*). It is open to interpretation what constitutes 'three distinct places' and 'another site'. An excursion of the Scottish Alpine Botanical Club (Adam 1938) reported observing 'two patches', in what appears from the text to be the classic locality above Glen Brittle. Currently there are reputed to be two localities in the classic corrie and now the new site found in 2003. Whether the Green and Jepson locality, by pure coincidence, is the same as that of Druce is perhaps worthy of further research, along with an extensive survey of the Cuillin corries to determine the true picture. Do we have to wait another hundred or so years for other localities to be found?

Acknowledgements:

I should like to especially thank Ian Green for his invitation to join him on Skye and his contribution in our partnership in finding the population of *Arabis alpina* elsewhere in the Cuillins. I would also like to thank him for his good companionship. Additional thanks go to R.D.S. Wilson and G.P. Morris for accompanying me on the unsuccessful searches in 1992 and 2002 respectively. I would also like to thank Tim Rich for historical notes and comments to the draft text.

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- PETER JEPSON, Rokeby, 61 Earnsdale Avenue, Sunnyhurst, Darwen, Lancashire, BB3 1JR
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Arabis alpina in new locality on the Cuillin Mountains with plant in flower at old locality in inset.

Photo P. Jepson © 2004

LEMNA MINUTA VI. DIVERSE ALGAL ENDOPHYTES WITHIN ROOT TISSUES

Malcolm Storey suggested that the greenness of the *Lemna minuta* (Least Duckweed) roots illustrated in my article (*BSBI News* 95: 31 (Jan. 2004)) was not (entirely) attributable to *Lemna* chloroplasts, but to **endophytic algae**. This applied particularly to one of the microphotographs, Fig. 2 (Jan. 2004). The size, shape and apparent intracellular distribution of the green bodies within the other 3 microphotos seem to fit the characteristics of vascular plant chloroplasts: but the green bodies *en masse* in the same Fig 2 illustration are different.

The main difficulties in pursuing further the idea of algal *endophytes* including my technical inability to cut good sections, the special questions surrounding the permeability of young *Lemna* root caps, and most of all the incredible diversity of the green bodies. Appearances varied immensely from colony to colony, at different depths of focussing on the living preparations, at different times, and especially at different ages of root when algal *epiphytes* could complicate the picture. It was no use giving in to tiredness, delaying examinations of living material until the ensuing day(s), as the green bodies could migrate or sporulate or cease to become green when the microscope was set up again.

Malcolm was undeniably right. Before giving the evidence for this, the special point of the root caps must be made. The *Lemna* root tips are often most green when young, when the root caps are firmly sealed (see diagrams 1 & 2). When older, looser and most easily removed, alga can also float in around the loose seal, forming sheets of green inside which might be better termed 'internal epiphytes' rather than true tissue-penetrating endophytes. However, as implied, algae also invade deep into the tissues of young sealed root tips (Fig. 2, *BSBI News* 95: 31). The majority of the invading green bodies appear to be Chlorophytes (Chlorophyceae) with starch reserves which stain black with iodine; but I

think that these *Lemna* root-invading endophytes also include at least one genus of Cyanophytes (Blue-green algae).

Explanation of colour photos (see colour section plate 4)

1. **Internal surface of Root Cap Sheath:** Mainly sheets of the 'Hot Cross Bun' algae (see diagrams 1 & 2 (p. 36), the inner surface of RC: also diagram 3 (p. 36), GHCB. The rectangular cells are very approximately 60-70 μ (microns) long, to give some idea of scale.
2. **Internal surface of Root Cap Sheath (younger root than preceding).** Sheets of dividing algae, 2 or more types. One algal cell gives the appearance of actual mitotic division, and many show the internal algal chloroplasts (see diagrams 1 & 2, the inner surface of RC).
3. **Root Shaft, Cortical Cells (approx. 40-60 μ long).** Green bodies mostly small and varied, 1-5 μ (see diagrams 1 & 2, within Calso diagram 3, mostly GSC).
4. **Root Shaft.** Green bodies (most approx. 2-5 μ) at different depths around cortical rectangular cells. The needles would appear to be raphides, possibly of Calcium oxalate, which are supposed to discourage water snails from eating *Lemna* tissues. If so, Wiltshire water snails are not put off (*BSBI News* 96: 31) (see diagrams 1 & 2, within Calso diagram 3, mostly GSC).
5. **Root Shaft, Stelar Tissues.** This microphoto image is focussed more deeply into the *Lemna* root than preceding, but with similar types of green endophyte. These seem to be clustered around the Stele (Central Vascular Cylinder) and most probably invaded the stelar tissues (see diagrams 1 & 2, around and probably also within S: also diagram 3, GSC, GP & GL).
6. **Older Root Shaft, lower magnification than preceding.** No cover slip, beneath the frond, under water. Although inferior to the 5 preceding microphotos, this illustrates the multiplying algal cellular plaques and lines on and between the cortical cells (diagrams 1 & 2, within C: diagram 3, GP & GL). Because of the greater depth of focus, the out-of-focus dark green clusters apparently inside the stelar (central) region are probably either within the near or far (or both) cortical tissues, only the algal clusters at the 2 sides being almost in focus. Even so, the central vascular cylinder (stele) is strongly and diffusely green.

Amongst the many puzzles, the greatest mystery of the occasional invasion of the meristematic region (diagram 1, M) by large algal cells 5-40 μ in diameter is scarcely credible: but I no longer think that this was an artefact of microphotography (digital camera) (*BSBI News* 96: 30). Young *Lemna* roots appear to grow faster, live longer, and resist *epiphytic* concretions better when they are colonized by green *endophytes*, than when they are colourless.

Summary: The green roots of *Lemna minuta* are more often, and mainly, due to green algal endophytes, rather than to intracellular chloroplasts. These microscopic green algae comprise 5 \rightarrow many types. The root tissues are invaded *before* the root cap loosens; but algal colonies *also* form as sheets and clusters inside loose root caps, on the inside surfaces, like green-lined test tubes ('internal epiphytes' vs 'endophytes'). Penetration of the cortical tissues by algal endophytes occurs along the shaft, from root tip and meristem to under the frond, and from the outer cortex to (and probably into) the central vascular cylinder. Green roots are the healthiest, giving the most vigorous and long-lived colonies, implying symbiosis. Most (or all) of this probably also applies to *Lemna minor* (Common Duckweed), but *L. minor* populations with non-green transparent roots are commoner than the *L. minuta* equivalents, and seldom occur in mixed populations. The endophytic algae may colonize from one *Lemna* species to the other.

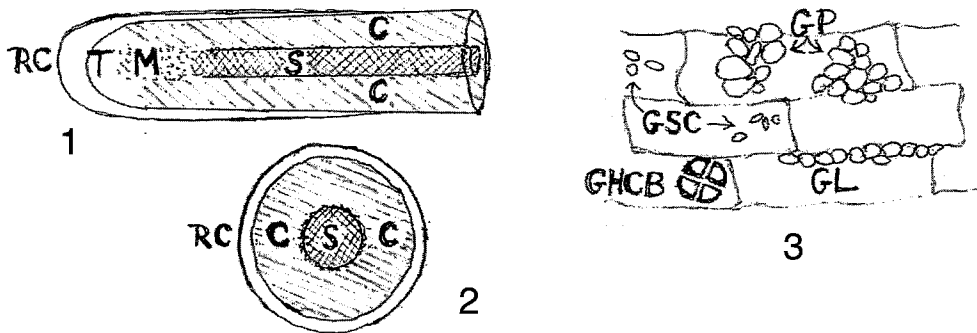
Acknowledgements: To Malcolm Storey (see text), and to Joan M. Davies for her selection, preparation and presentation of my colour microphotographs.

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OLIVER, J.E. 2004. *Lemna* mosaics and water snails. *BSBI News* 96: 31

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Lemna minuta root diagrams: longitudinal, transverse, and algal invasions of cellular tissues

RC = Root cap. T = Root tip. M = Meristematic tissue. C = Cortex. S = Stele

GP = Green plaques of dividing algal cells, face-on between rectangular cells

GL = Green lines of dividing algal cells, side-on between rectangular cells

GSC = Green scattered cells around rectangular cells

GHCB = Green 'Hot Cross Buns', mostly lining inner surface of RC, but occasionally within C

3-WHORLED *EPILOBIUM OBSCURUM*: FEATURES AND PROGENY

Near the edge of Coate Water, Swindon, we noted in Spring 2003, three Short-fruited Willowherb (*Epilobium obscurum*) plants with 3-whorled leaf arrangements. They were close together and probably derived from the overwintering stolons of one 2002 plant. One of us pulled up one of these for growing on, and further scrutiny (see photo, p. 37). Clapham, Tutin & Moore (1989) and Stace (1997) both mention this phenomenon in *Epilobium*, Stace emphasizing its rarity.

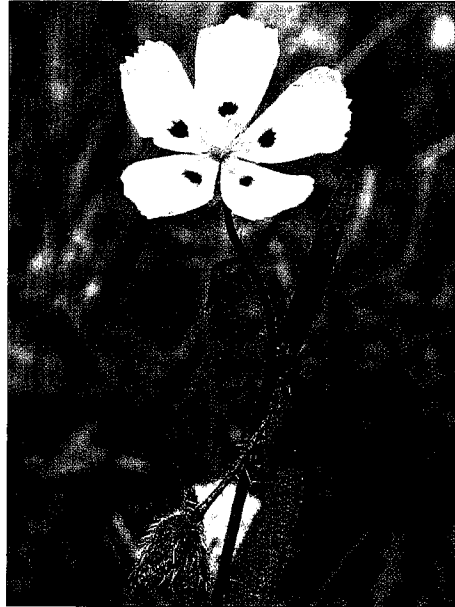
After the initial wilt and near death, the plant grew rapidly with the following series of characteristics:

1. The central axis continued to produce 3-leaf whorls, with elongating lateral shoots from each axil from July onwards.
2. The axillary shoots all had the normal paired leaf arrangements, the lower axils in turn producing further (tertiary) stems, again with paired leaves.
3. The plant grew to reach a height of nearly 150cm, twice the height of the maxima given in Clapham, Tutin & Moore (1989) and Stace (1997).
4. The combined effect of the rebranching (2 above) and height (3 above) created a bushy shrub-like effect, with profuse flowering in July, August and September. All the branches became woody, but so brittle that a touch could cause them to snap off where they joined the main stem. There were more than 30 flowering branches.
5. Notwithstanding the brittle branches, seeding was also profuse both gathered and naturally scattered seed produced massed healthy seedlings.

We grew on more than 100 seedlings. Disappointingly all turned out to be perfectly normal in the summer of 2004. This makes a somatic cell mutation (or other aberration) in the 2002 stolon more probable than a germ-line mutation, though the latter is not ruled out if caused by a double recessive gene. Despite this, the 2003 3-whorled plant could be considered a success in evolutionary terms: more, or many more, healthy progeny than a normal *Epilobium obscurum* would produce in one year.



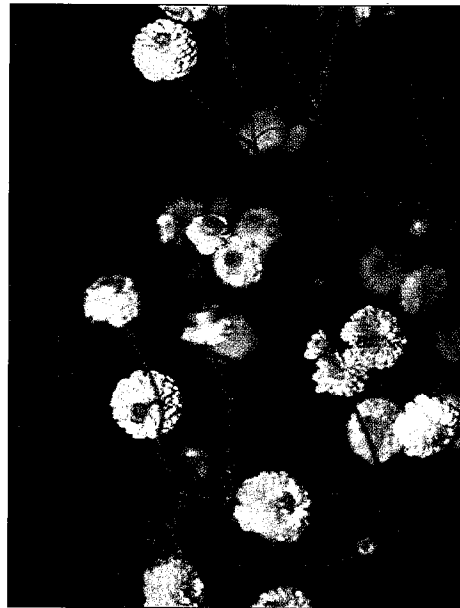
(1) Pansy with both violet and white flowers
Photo S. Hawkins © 2004



(2) *Tuberaria guttata* on Coll
Photo A. Oliver © 2004



(3) *Epipactis helleborine* pollinia on *Agrostis capillaris*. Photo A.G. Hoare © 2004



(4) Double flowered *Ranunculus acris* at Brentwood
(v.c. 18). Photo D. Winstanley © 2003



(1) *Dictamnus albus*



(2) *Dracocephalum austriacum*



(3) View from limestone outcrop looking down on surrounding woods possibly featuring *Quercus pubescens*

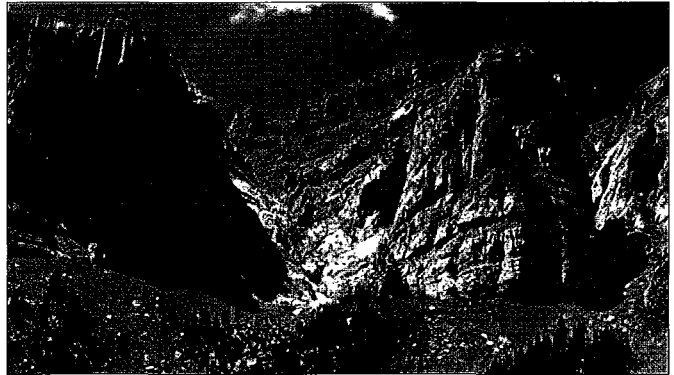
All three photos taken on the Bohemian Karst at Srbsko nr Karlstein about 30km SW of Prague. J. Bailey © 2003



(4) *Saxifraga media*



(5) *Campanula persicifolia*



(6) limestone buttress of the Serra del Cadí, Catalan Pyrenees

First two flower photos, J.L. Muddeman © 2004; landscape photo, T. Farino © 2004



(1) Late Vegetative Phase of *Pf* genet (on side of *Sa* tussock)



(2) Dormant Phase of *Pf* & *Pv*

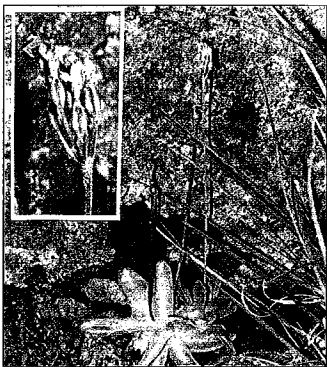


(3) Early part of Vegetative Phase of *Pf* (& *Pv*).



(4) Flowering Phase of *Pf* (& *Pv*).

Seven phases in a one-year life history of a plant of *Primula farinosa* (*Pf*) on a vertical cliff in Wharfedale, North Yorkshire, the liverwort *Preissia quadrata*, and leaves of *Sesleria albicans* (*Sa*) are also evident, as is a shoot of *Pinguicula vulgaris* (*Pv*). See text for details.



(5) Beginning of Fruiting Phase of *Pf* (& *Pv*): dead corollas still present; scape still elongating.



(6) Fruiting Phase of *Pf*: rigid scape and ripe capsules.



(7) Senescent Phase of *Pf*: oldest leaves dead, youngest leaves yellow; scape, calyx, and capsules persistent



(8) *Gnaphalium coarctatum*, new to Guernsey & BI.
Photo B. Ozanne © 2004

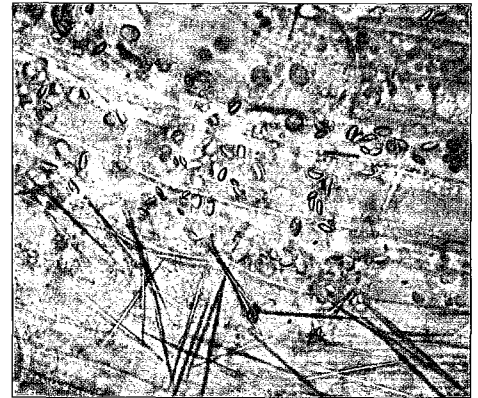
All 7 *Primula* photos, D.I. Hambler © 2003/2004



1. Internal surface of root cap sheath



3. Root shaft; rectangular cortical cells



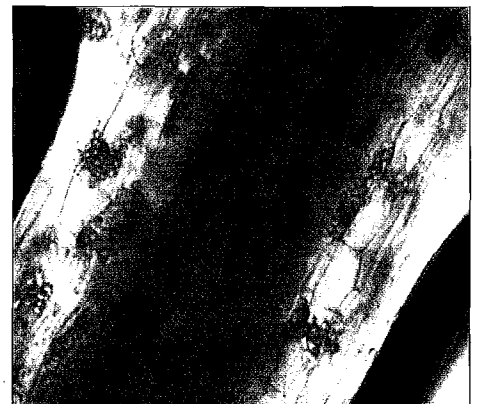
4. Root shaft; cortical cells, raphides & massed endophytes.



2. Internal surface of young root cap sheath



5. Root shaft; massed endophytes surrounding stelar tissues



6. Older root shaft; endophyte plaques between cortical cells.

Diverse algal endophytes within root tissues of *Lemna minuta*. Photos J. Oliver © 2004

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Acknowledgement: Our thanks to Joan M. Davies for the scanning reproduction of the photo.

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Three-whorled *Epilobium obscurum*.

Photo J. Oliver © 2003

BOTANY IN LITERATURE - 34

The genus name *Hyacinthus* L. (Hyacinthaceae), derived from the Ancient Greek Ὑάκινθος and thus pronounced in Classical Latin as Hūākinthus comes from two Greek myths: (1) The Fall of Troy (Bulfinch, 1993 [1796-1867]: 282) and (2) Apollo and Hyacinthus (ibid.: 83-84). The latter, which relates the story of a beautiful Spartan youth, son of Œbalas, beloved by Apollo, and accidentally killed by a blow from his quoit (possibly blown off course by jealous Zephyr), whereby from his blood sprang an eponymously named flower marked with an exclamation, is the better known (see also Ovid, *Metamorphoses* 10.162 sq; Hyginus, *Fabulæ* 272; Pliny, 21.11.38 §66; Virgil, *Eclogues* 3.63, 6.53, *Georgics* 4.183, *Aeneid* 11.69¹), but here, rescued from relative obscurity, is Bulfinch's re-telling of the first.

The body of Achilles so treacherously slain was rescued by Ajax and Ulysses. Thetis directed the Greeks to bestow her son's armour to the hero who of all the survivors should be judged most deserving of it. Ajax and Ulysses were the only claimants; a select number of the other chiefs were appointed to award the prize. It was awarded to Ulysses, thus placing wisdom before valour; whereupon Ajax slew himself. On the spot where his blood sank into the earth a flower sprang up, called the hyacinth,² bearing on its leaves the first two letters of the name of Ajax, Ai, the Greek for "woe".³ Thus Ajax is a claimant with the boy Hyacinthus for the honour of giving birth to this flower. There is a species of Larkspur which represents the hyacinth of the poets in preserving the memory of this event, the *Delphinium Ajacis* [sic]⁴ – Ajax's Larkspur.

Notes

1. Virgil: *Eclogues* 3.63: ... *suave rubens hyacinthus*... (sweet blushing hyacinths) 6.53: ... *mollis ... hyacintho*... (soft ... hyacinths); *Georgics* 4.183: ... *ferrugineos hyacinthos* ... (the dusky hyacinth); *Aeneid* 11.69: ... *languentis hyacinthi*... (drooping hyacinth).
2. hyacinth: (i) c.f. the genera *Hyacinthoides* Heist. ex Fabr., and *Hyacinthella* Schur., both also Hyacinthaceae. (ii) Freud's (1991:192) account of the poet Heinrich Heine's joke '... I sat beside Salomon Rothschild and he treated me quite as his equal... quite famillionairely' uses the word, the above remark being put by Heine into the mouth of a comic character, Hirsch-Hyacinth, a Hamburg lottery agent, extractor of corns, and professional valuer, the valet of the aristocratic Baron Cristoforo Gumpelino (formerly Gumpel). Various associations with people, especially a rich uncle called Salomon, relate the joke to events in Heine's own life, such as his rejection by wealthy relatives; obviously the persona of Hirsch-Hyacinth represents Heine (H.H.).
3. the Greek for 'woe': that is to say, αἰ or αἶ (authorities vary) an interjection of astonishment or grief, frequently doubled as αἰαἶ (Liddell & Scott, 1951) (c. f. (i) the 'Ah ah!' marked upon the petals of 'a flower of hue more beautiful than the Tyrian' in the above mentioned myth of Apollo and Hyacinthus, (ii) ὠὐ, an exclamation of admiration, also of alarm, sometimes uttered as ὠὐ ὠὐ. [Our apologies to Margot for being unable to reproduce correctly the accented Greek characters in this paragraph. Eds.]
4. *Delphinium Ajacis* [sic]: i.e. *Delphinium ajacis*, Rocket Larkspur, now a synonym of *Consolida ambigua* (L.) P.W. Ball & Heyw. (*Consolida ajacis* (L.) Schur.) (Ranunculaceae) of Mediterranean origin, although Lewis and Short (1879) consider it may also be either *Iris germanica* L., the Corn-Flag, or *Gladiolus*, *Gladiolus communis* L. (both Iridaceae).

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CONSERVATION NEWS & VIEWS

ARE SOME SPECIES MISSING FROM THE NEW PLANT STATUS LISTS FOR GREAT BRITAIN?

We are involved in a project to describe aspects of the ecology of weed species that are recorded early in the archaeobotanical record and for some of the measurements we need to collect a few leaves. As some of the species are quite rare in the British Isles, any collection of plant material needs to be carried out with the full permission of English Nature and other relevant conservation bodies. The Species Status Assessment Project at JNCC provides the most up-to-date thinking as to conservation designation of species and our first action was, therefore, to consult the new plant status lists produced for this project (Cheffings 2004). Species are designated according to the number of hectads in which they are recorded in the *New Atlas* and also according to their status. Only native species and archaeophytes, plants that became naturalised before AD1500, are included. 'Good', we thought, 'Our task of identifying vulnerable species will be simple.' Unfortunately, to our surprise the very first species that we looked up, *Rhinanthus angustifolius*, was not in the new list despite its Red Data Book status in Wiggington (1999). Stace (1997) gives the species as native but the *New Atlas* records it as a neophyte, an alien that did not become established until after AD1500. This new designation of *Rhinanthus* was counterintuitive. We, therefore, decided to take a brief look at how the status of a species was identified.

Classification of status doesn't seem that straightforward. According to the *New Atlas*: '*The separation of archaeophytes from natives and neophytes relies on a combination of palaeobotanical, archaeological, ecological and historical evidence. Both archaeophytes and neophytes are usually absent from the fossil record in the last glacial period, the late glacial and the early post-glacial. We have identified plants as archaeophytes if they are more or less confined to artificial habitats and are known or suspected to have been naturalised in our area before 1500, but these species were usually recorded before 1700. There is no evidence that plants classified as neophytes were growing in the wild before 1500 and many come from areas such as the Far East or the New World, which in itself virtually precludes the possibility that they arrived before that date.*' Thus status as defined in the *New Atlas* is as objective as the available records allow. We regard the classification, which is described in greater detail by Preston, Pearman & Hall (2004), as a major advance and have used it in the second edition of *Comparative Plant Ecology*. Nevertheless, we doubt whether status as defined in the *New Atlas* is a sound basis on which to judge the fate of an endangered plant.

Let us now consider the archaeobotanical and historical records and the ecological criteria, which are a key issue for identifying alien species and for separating archaeophytes (to be protected) from neophytes (not to be protected). If a species is present in the archaeobotanical or historical record, this may rightly be taken as proof positive that the species is a long-standing component of the British flora and, if threatened, is deserving of conservation. The absence of any record, however, means one of two things (a) it wasn't around before AD1500 and isn't worthy of protection or (b) it was around but wasn't present in the available samples (*i.e.* worthy of protection but not likely to get it). Only if the archaeobotanical and historical record is good can we be happy that we are protecting all the species that fit JNCC's criteria and are not excluding any type (b) species. The pioneering paper of Rich and Woodruff (1992), has identified the need to correct for recording bias in contemporary recording schemes. They state that '*Recording bias in botanical surveys arises primarily from the recording behaviour of individual botanists, sometimes coupled with the survey techniques and the types of plants being recorded. Recording bias is probably widespread in botanical surveys; it does not invalidate the records, but requires that care is taken with interpretation. Some generalizations are made to help to assess recording bias, ...*' We need to consider whether our assessment of past distribution needs to be similarly treated. Rich and Woodruff identify three types of bias related to (a) the quality and quantity of recording, (b) recording methods and (c) the types of plant being recorded. We have, therefore, looked for evidence of similar bias in the available data on past distribution.

Before this, however, it is important to understand where these past records come from. Ancient plant material in Britain is derived from two principal sources. Firstly, there are *soil/sediment cores from natural deposits*. These are taken with the aim of reconstructing past environments primarily using pollen (**palynological data**). Pollen is best preserved in anaerobic waterlogged conditions, and cores are generally taken from lake sediments and other naturally wet habitats such as mires and bogs. Usually, only small quantities of plant macrofossils (seeds, leaves, stems and roots) are present in the cores. The second source of information is *samples from archaeological sites*. These are collected to aid our understanding of how people lived and used the land in former times. The **archaeobotanical data** derived from these investigations relates to plant macrofossils. On British archaeological sites, most plant macrofossils are preserved in one of three ways:— anaerobic preservation (main source of material in waterlogged sites), replacement of plant tissues by inorganic minerals (where water percolates through mineral-rich deposits) and preservation through carbonisation after plant material has been deliberately or accidentally exposed to fire (this is usually the main source of preserved plant material at dry sites).

The extent and reliability of the evidence for past plant distributions is determined by the nature of these different material sources, and is dependent on a number of factors relating to mode of arrival, quality of preservation, accuracy of identification and geographic coverage. There is a large literature on the problems of interpreting such data. Rather than include a full literature review, which would be inappropriate for *BSBI News*, we refer readers to the general discussions of the problems by Green (1982), for archaeobotany, and Moore, Webb & Collinson (1991), for palynology, which consider some of the points raised below.

1. Biases related to mode of arrival.

The palynological record Non-local pollen arrives at potential coring sites primarily through airborne transport and, in the case of lakes, carried in rivers and streams. Species an identical distance from the sampling site may, however, have very different probabilities of appearing in cores. Those with small pollen grains (e.g. *Artemisia*) are more common components of the pollen record since they tend to be much more widely dispersed than species with larger pollen such as large Poaceae.

The archaeobotanical record The manner in which plant remains arrive on archaeological sites is more varied and, particularly in the case of charred (carbonised) plant remains, is often determined by human selection – for food, fodder, building materials, etc. Thus, records are heavily biased towards species with a practical use plus species, such as arable weeds, inadvertently collected with the utilised plants. Moreover, some species (e.g. those that require parching or cooking, and those whose remains are likely to have been disposed of on household fires) are more likely to come into contact with fire than others. Waterlogged deposits additionally preserve species growing in and around archaeological sites resulting in a species list biased towards disturbed habitats. The same applies to mineralised macrofossils and, in addition, cress deposits provide a rich source of minerals where there is a bias in favour of food plants.

2. Biases related to quality of preservation.

The state of preservation of plant macrofossils is very dependent on the method of preservation. In fully waterlogged conditions, a wide range of plant parts, including stem, leaf and root tissues may be preserved in addition to seeds, fruits and pollen. Preservation due to charring and mineralisation is largely restricted to fruits and seeds and so there is a strong bias against species which are not flowering or seeding at the time of deposition or which were brought onto archaeological sites when not in flower or seed, for use of their other plant parts. Varying degrees of waterlogging, soil mineral content and levels of disturbance can also affect the range of surviving waterlogged and mineralised plant material. With charring, the temperature and duration of heating as well as the atmospheric conditions and seed content, determine the likelihood of preservation: very high temperatures, an oxidising atmosphere and high water or oil content can all dramatically reduce the degree of preservation. Species with hard, robust seeds or fruits (e.g. Polygonaceae) are more likely to survive charring than species with fragile or oil rich dispersules (e.g. Poaceae). Even the pollen of some species is more fragile and less likely to survive than that of other species.

3. Biases related to accuracy of identification.

The taxonomic level to which plant material can be identified varies according to both the part of the plant preserved and the taxonomic affiliation of the plant itself. Pollen, for example can rarely be identified beyond the genus level (and often only to family). For many taxonomic groups, fruits and seeds are more readily identified to species but, for others, accurate identification beyond the genus or family is again not possible and inappropriate attempts at taxonomic precision have resulted in a few dubious identifications in the archaeobotanical literature.

4. Biases related to geographic coverage.

Pollen coring sites are restricted to areas with suitable preservation (lakes, etc.). Archaeological coverage is similarly patchy with excavated (and sampled) sites of different periods unevenly spread across the landscape.

The nature of the historical record together with the four types of sampling problems outlined above provide good grounds for treating the palynological and archaeobotanical records as biased and incomplete, and consequently unreliable as a source of evidence for the date of introduction of individual species. We cannot, therefore, claim to be able to objectively separate all native species from later colonists and, because the absence of evidence is not proof of absence, some species classified as archaeophytes, and even a few neophytes, may in fact be native.

Can we be any more certain about the more recent historical record? In the *New Atlas* it is stated that '*We have identified plants as archaeophytes if they are more or less confined to artificial habitats and are known or suspected to have been naturalised in our area before 1500 but these species were usually recorded before 1700*'. AD1500 is back in the 'Taxonomic Dark Ages', 250 years before Linnaeus's *Species Plantarum*, and even AD1700 represents a very early stage in the description of the British flora. The sampling issues discussed with respect to the archaeobotanical record appear equally relevant here. What proportion of our native species were recorded by AD1700? Unless the answer is almost 100%, how strong are the grounds for assuming that certain neophytes were not present before 1500? Are the historical and archaeological records complete enough to have detected scarce components of the British flora?

Preston, Pearman & Hall (2004) note that archaeophytes and neophytes are ecologically similar in that most occur predominantly in artificial habitats. They also state that the decision to classify a species as native or alien should ideally be based upon archaeobotanical and historical evidence and we agree with this. Ecological criteria should play little part in the separation of archaeophytes from neophytes. Preston, Pearman & Hall (2004) do identify differences between the two groupings. Archaeophytes are likely to have increased or decreased in response to changes in environment and land use but unlike neophytes are unlikely to have expanded rapidly into previously available habitats. Moreover, archaeophytes may be expected to have an uncertain native range and to be widely distributed elsewhere both in Europe and beyond. We have reservations about all of these three assertions and to their credit Preston, Pearman & Hall acknowledge that there are exceptions to these generalisations.

The abundance and long-term survival of an individual species is likely to be very much a function of the quantity of suitable habitat and the effectiveness of vectors of dispersal allowing colonisation of new sites. Since the archaeological record is fragmentary, our knowledge of quantities of suitable habitat and possible vectors of distribution is similarly deficient. The number of species making the crossover from native to artificial habitats could easily be greatly underestimated and as a result a number of native species may on ecological grounds be misclassified as archaeophytes or neophytes. Moreover, it is difficult to separate 'colonising of previously available habitats', a character for identifying neophytes from 'increased or decreased in response to changes in environment and land use', a feature more typical of archaeophytes (and native species). The spread of neophytes such as *Fallopia japonica*, a species initially from the other side of the world and more recently (1825 onwards) of gardens, may well fall into the category of colonising previously available habitats but where is the evidence for species such as *Rhinanthus angustifolius*, first recorded in 1724 and classified in the *New Atlas* as a neophyte? Despite these reservations, the use of these ecological criteria can be justified in the context of scientific investigation. Science is advanced through investigation and debate. Are these

ecological criteria, however, sufficiently robust and uncontentious for use in the context of implementing conservation policy?

The catalyst for this note, *R. angustifolius*, illustrates some of the problems above. The plant is not recorded in the definitive 'ABCD' archaeobotanical database for Britain (Tomlinson & Hall 1996) but it is recorded, albeit with a question mark, in RADAR, the comparable database for the Netherlands. The problem is that the plant remains detected in the Netherlands could not be separated from *R. minor* and an aggregate taxon, *R. angustifolius/minor*, is recorded. Perhaps *R. angustifolius* is in the archaeobotanical record for the Netherlands. If it was (doubtfully) present in the Netherlands, perhaps it occurred in Britain as well, perhaps even as a native species? It is easily overlooked, and the *New Atlas* cites modern examples of this happening, yet its first record in Britain is 1724 (Preston *et al.* 2002). Moreover, the *New Atlas* indicates that the plant is in the process of making the ecological changeover from being largely confined to artificial habitats (arable land) to an association with more permanent semi-natural vegetation (chalk grassland and scrub). Is this the reversal of a change in ecological distribution that happened in Britain many centuries ago? Is the plant really unworthy of statutory protection?

If you read the text relating to the separation of native species, archaeophytes and neophytes in the *New Atlas*, there is a clear 'health warning'. Archaeophytes 'are known or **suspected** to have been naturalised in our area before 1500 but these species were **usually** recorded before 1700... There is **no evidence** that plants classified as neophytes were growing in the wild before 1500.' [and no evidence that they weren't!]. Moreover, Preston, Pearman & Hall (2004) emphasise the indirect nature of the evidence used to identify archaeophytes and state that 'the suggestion that a species is an archaeophyte is best regarded as a hypothesis to be tested by further studies'. By inference, the same can be said of some neophytes.

The *New Atlas* team has done a terrific job trying to clarify the status of British species. Doubtless, there were discussions, and perhaps even arguments, about individual species. The team has made the most of inadequate data sources. Our interpretation of subsequent events, as illustrated by the species lists in Cheffings (2004), is that the designations in the *New Atlas* have been used unquestioningly to inform conservation policy (with the exception of the inclusion of *Bromus interruptus*, a neophyte and crop mimic). 'A little learning is a dangerous thing' and we think it would be preferable if conservation bodies forgot the term 'neophyte'. The concerns of Rich and Woodruff about sampling bias in recent surveys are equally relevant to the archaeological and historical record. By all means leave out Near Eastern and New World species, along with garden escapes and the like. We regard the protection of the natural and semi-natural habitats of our forbears and their constituent species as the key issue. Wouldn't it be better simply to protect all rare and declining species of these habitats? Such a view, incidentally, is very much in line with the more 'inclusive' approach adopted in *A Nature Conservation Review* (Ratcliffe, 1977) and in earlier editions of the *Red Data Book* (Perring & Farrell, 1977, 1983).

Given the various limitations of the palynological, archaeobotanical and historical records outlined above and of the ecological information available, we would argue that conservation bodies should be prepared to consider *any* rare and/or declining species as a candidate for conservation action – *whatever* its status in the *New Atlas*, provided that it is long established in Great Britain. *Fumaria reuteri*, for example, given as 'neophyte', is surely no less deserving of conservation action than *F. vaillantii*, listed as 'archaeophyte', or than *F. purpurea*, listed as 'native'. It was included, just like *Rhinanthus angustifolius*, in the 3rd edition of the *Red Data Book*, and it is listed on Schedule 8 of the Wildlife & Countryside Act. And yet, unlike *F. vaillantii* and *F. purpurea*, it is missing from the new JNCC lists (Cheffings 2004), despite being quite clearly the rarest and most endangered of the three!

We trust that through the Species Status Assessment Project, the conservation agencies will have an opportunity to consider again the wisdom (or otherwise) of using uncritically the status categorisations in the *New Atlas* when trying to decide which species are worth conserving, and which aren't.

Acknowledgements

We thank Dr Ken Thompson for constructive comments on the manuscript.

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[A draft of this article was shown to Chris Cheffings of JNCC whose comments are given below followed by a reply from one of the authors. Eds.]

The JNCC Species Status Assessment project continues to assess how native or non-native status should be used during Red Listing. The current Red Data Book (Wigginton, 1999) describes how species were selected according to their native status, and explains that thirty species were rejected at that time since they were almost certain introductions. Red Listing is only one tool in assessing conservation priorities, and since both *Rhinanthus angustifolius* and *Fumaria reuteri* remain listed on Schedule 8 of the Wildlife & Countryside Act, they continue to enjoy statutory protection whatever their native status.

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Unfortunately, Chris Cheffing's comments miss the main point. I am pleased that the species to which we refer in our note are protected. What happens, however, the next time that there is an assessment of a new batch of declining species not already protected by Schedule 8 of the Wildlife & Countryside Act? Will they be judged by the new rules or the old? In view of the inadequate nature of the historical record, I believe that conservation policy should be like the judicial system; there should be a presumption of innocence, or in this case, 'worthiness of conservation', until guilt, that the plant is a recent introduction, has been established. I hope that the JNCC Species Status Assessment project will consider our misgivings with regard to the present system of selection that relies so heavily on whether a species is, or is not, classified as a neophyte.

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ALIENS

INVADING ALIENS – OR INVADING NATIVES? – FEEDBACK

I have had just over 80 responses to this note in the last *News* (96: 41) – an unprecedented feed-back! Many extra invading natives were suggested, though none threatened the main three – Ivy, Bramble and Bracken. I am slightly concerned that every response was in support of what I had written – concerned because this is entirely at variance with received wisdom, and I am not sure what to do next, except to try and take a message to an ‘industry’ that will not want to hear it. I have asked our Science and Research Committee if they would consider it within their remit to see if the BSBI could make a formal response to DEFRA. BBC Radio 4 has suggested that we might care to make a radio programme in the ‘Nature’ series, on this point of view.

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INVADING NATIVES?

David Pearman’s thoughts were interesting, on rampant lowland plants (*BSBI News* 96: 41-2). The increasing boskiness may be due in part to climate change, recent agricultural practices, land managers not cutting back brambles and ivies as much as formerly and lowland domestic grazing domestic animals being scarcer (so less browsing). Agricultural run-off has enriched ditches, bogs, pools, streams and saltmarshes and has been detected in the sea. Old-style roadmen hand-cut verges, scooped out ditches and trimmed hedges – now, if your council doesn’t poison roadsides (and many do so less) the hedges are done with a mechanical flail, and that may be all. Perhaps bracken is being less attacked nowadays? I can remember the Isle of Arran in the 1950s with it increasing in the north onto short pasture in abandoned farms.

Here in v.c. 99 our *Petasites* are no more alarming than before, Japanese Knotweed is slowly encroaching in two areas of mown grass. Last summer’s heat-wave however, has suited the Giant Hogweed, it seems never to have been so green and tall, it’s managed to cross the railway at Dumbarton and looks set for a population explosion.

Should we worry? What is the answer? Our landscape is considerably altered and is no longer being manicured as it was in the 1950s and 60s. Two German students came here in the 1980s and commented on our rough areas, waste ground, species-rich verges and mixed woods – they were used to all their countryside ‘accounted for’, in use and neat.

Perhaps now that David Pearman is in Cornwall, he’ll be seeing our other native ivy species – the Atlantic, which is much more rampant than the Common. A recent volume of *Flora Iberica* with the *Hedera* account, follows Hugh McAllister’s classification and has the former at species rank – *H. hibernica*, this is the common ivy of Portugal and there seems to be more of it than *H. helix* in Spain. Atlantic ivy is not only more vigorous than Common, but it can happily grow in both very well-drained and quite moist soils, it does not need basic conditions either. (Common Ivy dislikes places too dry or wet, and requires some alkalinity) these characters allow Atlantic Ivy to romp merrily where the Common may grow poorly or be absent. Someone unfamiliar with the behaviour and tolerance of very acid soils by *H. hibernica*, could well, on seeing its rapid tendrils, conclude our ‘native’ ivy has gone mad! Another feature in the UK at least, is it enjoys full sun and in full light makes dense carpets seen on coastal rocks and sand or shingle above HWM, but in shade it goes ballistic. Probably trying to reach the light. My sister has moved to south Devon and has a conifer wood planted by a former owner. Strands of ivy cross the gloom below, but if a tree falls she gets some brambles, but the ivy takes off like a rocket. At the sunny edges outside however, it forms a neat border.

Her brambles seem no worse than Central West Scotland’s. In the 1960s the Pteridological Society had two excursions to Arran. In many places the Old Sea Cliff was fronted by a bog then at the base a rim of brambles and Clive Jermy demonstrated how to reach the cliff, a little stooped forward he entered backwards, wearing a thornproof jacket – this method really works. What had hitherto been a

look-only habitat, was now reachable. Similar tangles can form in woods if some trees fall or are felled and whatever comes up, is allowed to do as it may.

Is anyone aware of any small, slow rare/rarish British native being squeezed out, endangered or smothered by British rampers?

There is however, a menacing alien that maybe should go on some hit lists: the Tricoloured or Aluminium Archangel, *Lamium galeobdolon* subsp. *argentatum*, this makes the native subsp. *montanum* look like a feeble plant with its slow spread, deciduous shoots and need for slightly basic soil – in comparison it's (believed to be) Italian cousin, is rampant, evergreen, continues to grow in winter, revels in acid soils, and in a high rainfall area, can grow in full sun and quite good drainage. It can kill small shrubs by going over (as well as round) them and tacking its stolons down on the far side, depriving the victim of light, air and rain. I understand Cornwall is an area where this smotherer is being taken seriously.

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INVADING ALIENS – OR ILLOGICAL PERCEPTIONS?

In response to David Pearman's request for comments on alien species, I have the following thoughts. David takes issue with the tag of 'alien' species. Whether a particular plant occurs in a particular place at a particular time is governed by many variables, for example dispersal and reproductive strategies, nutrient requirements, the distribution of critical natural resources and pure chance. Humans can (and usually do) have an influence on the dispersal abilities of a plant and upon the suitability of a particular site for a certain species. When we have a substantial positive effect on the dispersal abilities of a plant, we often call these species 'alien' within the area to which we transported them (and consider them less worthy of existence within that area, sometimes to the point where we actively eradicate them).

This curious policy stems from a premise that 'natural' (without human influence) is good and 'unnatural' (influenced by humans) is bad. This 'badness' is then transferred to the plants whose dispersal abilities we have significantly influenced. This, of course, is complete nonsense. Humans, like any other organism, are not inherently good or bad, they just 'are'. And we are as natural or unnatural as any other species. If the seed of a plant reached a site via the foot of a human or the foot of a non-human makes no logical difference to any rights of existence we may (or may not) wish to impose upon the resultant plant. Therefore, I can see no good reason for labelling species' as 'alien', and hence of lesser worth, purely because their existence at a particular location was primarily aided by you and I.

Lastly, if some species (whether labelled 'alien' or 'native') become dominant over certain areas we may wish to reduce such dominance through active management. Reasons for such action are varied and range from economically based motives to, seemingly in the case of David's, aesthetic values.

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CALLALOO AND ALBUGO

Callaloo is what the West Indian community call edible members of the genus *Amaranthus*. *Albugo* is a genus of parasitic fungi known as blister moulds; they are allied to the downy mildews.

Cooks, gardeners, mycologists and botanists must and do relate to these organisms in different ways. But since I have found them sustainably co-existing in east London, I feel stimulated to pen an account which demonstrates common ground and may broaden the awarenesses of all parties.

In fact callaloo comprises plants long familiar to British botanists except that we have associated them with very different circumstances. Two entities are involved. One is the clear-cut species *Amaranthus retroflexus* (Common Amaranth). The other we may view either as a variable species or as a cluster of neighbouring or evolving species which, for argument's sake, I shall lump together as the *Amaranthus hybridus* aggregate (Green Amaranth). These latter include some individuals which fit the

parameters of *A. hybridus* in the strict sense, but many others assume forms indistinguishable from *A. cruentus* and yet more may overlap into *A. quitensis*, *A. powellii*, *A. bouchonii* and *A. hypochondriacus* as summarised in Stace (1997). Taxonomic uncertainty has ever prevailed hereabouts so I cannot be more precise. It is quite feasible that F1 hybrids or on-going hybrid swarms are arising but again I'm in no position to claim that such be more than speculative.

These amaranths are all annual thermophiles. Both *A. retroflexus* and *A. hybridus* hail from the warmer Americas, they spread rapidly in the wake of human movements and they are now, in various guises, of pretty much pan-tropical distribution. They are not native to Great Britain but have frequently been carried here by accident with imported commercial products like bird and vegetable seed, soybeans, spices, fruit and raw wool (Clement and Foster 1994). Thus they would be regular, albeit short-lived, players in the exotic floral dramas of docksides, rubbish dumps and urban wastelands. I also used to find them each year in the shoddy fields of Bedfordshire (market gardens mulched with impure, rejected fleece from other continents) as well as on the domestic refuse tips of the Thames estuary. These could be bleak, desolate places; indeed for the alien weed enthusiast, spectacles of starkness and squalor often held a glamorous appeal not comprehensible to the rest of civilisation. Such passions are, alas, harder to requite in the more clinically efficient 21st century.

Seldom, I suspect, in such less than salubrious settings, did it cross our minds that some of the alien weeds we'd get excited about might also be fit to eat. Yet in other countries, and in other cultures, the particular amaranths which constitute callaloo have long been prized as 'soul food' rich in vitamins and minerals. As more immigrants settled in the UK, so this practice became more widespread here as well, with ethnic supermarkets also increasingly stocking both tinned and fresh foliage. London's climatic 'heat island' is especially favourable for the growing of healthy specimens out of doors; as a consequence, any wild plants found on pavements, roadsides or neglected urban sites nowadays will almost all be local escapes of culinary source. Cut down by late autumn frost, viable seed falls to the ground and may germinate in the following spring as long as the soil remains sufficiently turned over to permit growth space.

Since August 2002 I have been engaged to conduct identification workshops on plants and plant pathogens for the organic Hingham Hill Common Allotments Association in Walthamstow. Upon initial arrival I was dumbfounded to behold an absolute profusion of amaranths on all sides. They were flourishing on tilled and untilled plots alike. They also displayed the most bewildering ranges of morphology, with inflorescences soft or stiff, stocky or slender, slim or stout, and with colours anywhere between grey-green to golden brown to vivid purple. But what they were called was not even the immediate question. Why, I puzzled, were so many of them there at all?

Thus did my first day of teaching also become a memorable day of learning. Since childhood I had encountered these plants only as chance introductions into this country, as overlooked impurities with other products. Now I discovered that they are being raised as an esteemed product in their own right. Straightaway two concerns arose. Firstly had this latter intelligence ever been conveyed to the botanical fraternity at large? Secondly, is it respectful to continue using our traditional vernacular name – pigweed – for what we must now honour as an item of human food?

The next thing I discovered was that some amaranth leaves were pale-blotched above and white-crusted beneath. Since 1988 I have closely studied the parasitic fungi of plants in GB, and immediately recognised the symptoms of blister mould infection, genus *Albugo*. There are three native species of *Albugo*. The commonest and best known is *A. candida*, which I've seen on about forty different members of the cabbage family, Brassicaceae; it occasionally swells stems and fruits into the most grotesque parodies of themselves. The next in line of familiarity is *A. tragopogonis* which is less cecidogenic (gall-forming) but can still appear quite dramatic, thickly blistering particular members of the daisy family, Asteraceae. The least known one is *A. lepigoni* which produces rather insignificant bleached pimples on a single host of corresponding modesty in the chickweed family, Caryophyllaceae. It is the Sea Spurrey, *Spergularia marina*, which I've noted as host to this fungus on Canvey Island. But . . . an *Albugo* on an *Amaranthus*?

Moreover its presence proved markedly uneven and it soon became apparent that only *A. retroflexus* was susceptible to it. Out of thousands of amaranths inspected at Higham Hill Common, some 10% of *A. retroflexus* were affected in varying degrees but every member of the *A. hybridus* aggregate

was clean. Since mycelium-permeated seed must have originated from the New World, I needed recourse to a work diagnosing the pests and diseases of that continent and fortunately possessed one in Pirone (1978) which revealed that a blister mould, called *Albugo bliti* is indeed associated with *A. retroflexus*. So I was content that it was correctly identified. Its naturalisation in a British allotment was possibly unprecedented, therefore an observation I considered my duty to report to DEFRA. Whereupon it was duly acknowledged but also considered 'not a matter for action' (Dr Charles Lane, *pers. comm.*). Reassuringly it does not pose a significant health hazard to growers or consumers.

So, first and foremost, to plot-holders I can convey the message 'please don't worry about it'. Even, perhaps, be proud of it as an additional organism of scientific interest on your land. Heavily affected plants will look unsightly enough to deter consumption and may legitimately be destroyed. Lightly affected ones should really not hurt anyone. If you want rid of it altogether, simply select seed from the *A. hybridus* aggregate which is immune and raise your crop only from those; I will readily advise how to distinguish such plants from *A. retroflexus* if called upon. To botanists I convey that a group of familiar aliens now claims important cultivated status in Britain as well. To mycologists I report a parasitic fungus newly established in this country. To sociologists I recommend that this fungus be included in our future reference books on plant galls.

And ... 'pigweed'? Well, I have no qualms about retaining the name for all non-esculent members of *Amaranthus* and there are perhaps more than sixty species worldwide. After all it simply arose from the nutrient value of certain ones as swine fodder, just as fat-hen was highly reputed for plumping up poultry. However, in view of what I learned at Hingham Hill, I will personally adopt 'callaloo' as a more appropriate modern name for the amaranths focussed upon here, whatever circumstances I may find them in. It may further be subdivided as 'white callaloo' for *A. retroflexus* and 'green callaloo' for the *A. hybridus* aggregate whenever we want to make subtler distinctions.

After such (hopefully) mouth-watering discourse, what does callaloo actually taste like? To my palate it quite resembles spinach but comes across slightly sweeter and nuttier. Certainly it is a versatile vegetable adaptable to any main course. It can be eaten raw, lightly steamed or briefly boiled. Our own native fat-hen (the *Chenopodium album* aggregate) bears favourable comparison, gastronomically, presenting a soft, mild texture which is just as agreeable. Indeed the prehistoric peoples of northern latitudes were well aware of its nutritious qualities and European rural communities have periodically been forced to re-exploit the same in times of war. Fat-hen and callaloo alike grow best in well dug, well fertilised soils where I've seen vigorous examples approach 2m in height. Both may be gathered for the table with complete confidence.

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 BRIAN WURZELL, 47 Rostrevor Avenue, Tottenham, London N15 6LA

CONFUSION BETWEEN AGAPANTHUS AND TRITELEIA LAXA?

On 11 July 2004 John Powell found a single plant of a mystery plant in a field of barley at Eccleston, St. Helens (Merseyside). A fragment (coll. David I. Jolly) is now in **Herb. EJC**. Using Stace's *New Flora* (ed. 2, 1997, p. 941) it keyed out to *Agapanthus praecox*, with 10-15 bright blue flowers arranged in an umbel at the top of a scape, but it failed to agree in other characters. The leaves were much narrower, 5-10mm broad, and the stamens were only half as long as the perianth (not \pm equal), and already the leaves were withering away (*cf.* winter-green in *Agapanthus*). Also, the rootstock was a corm and not a tuberous rhizome.

Using the generic key in *The European Garden Flora 1*: 117-121 (1986), it keys out readily to *Triteleia*. This genus has the ovary perched on an unexpected stalk (carpophore) some 2-3x longer than the ovary at flowering-time. Surprisingly, the corms are edible, giving rise to the English name of

Grass Nut, all 17 species being native in western N. America. It matched well with *T. laxa* Bentham, better known to gardeners as *Brodiaea laxa* (Bentham) Watson – from N. California and S. Oregon.

This record appears to be the first for Britain outside of a garden, although back in June 1998 I noticed how freely it was self-seeding on the rock-garden scree at Hillier's Gardens and Arboretum (Ampfield S. Hants).

The origin of the Merseyside plant remains unexplained: there are only two houses in the area of the field, and neither grow this species. I wonder if other British records of small and fragile-leaved *Agapanthus*, should be attributed to *Triteleia*.

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

SENECIO MINIMUS – A NEW WEED ON THE ISLES OF SCILLY

During a week-long exploration of the flora of the Isles of Scilly (v.c. 1b) in mid-June 2004 by the Wild Flower Society (co-ordinated by Dr Chris Pogson), a mystery ?*Senecio* was discovered. There were no flowers, but two weeks later Derek Thomas re-examined the area and found one plant fully out, part of which was sent to EJC for identification. There were some 100 plants in an area on Abbey Hill (Tresco Island), showing a predilection for a pathside habitat. They grew up to about 3 feet tall and remained more or less unbranched except near the apex. Independently, Dr G. Halliday also reported finding this species in June 2004, in a spot close-by – *comm.* Mrs R. Parslow.

The contiguous Tresco Gardens grow many plants from New Zealand, and doubtless this weed was unintentionally introduced with some choice garden species. Our weed, *Senecio minimus* Poir. (Toothed Fireweed) is a native there and in much of Australia and Tasmania too, preferring 'wet sclerophyll forest'. It is introduced and now becoming a pest in California, where it is usually known as *Erechtites minima* (Poir.) DC.

This species was apparently first found on Tresco on 11th Oct. 2000 by A.A. Butcher (**Herb. EJC**) when he described it as "abundant in a newly-cleared area SW of the Tresco Gardens at map ref. SV8910.1419, but the record was not published. It grew with good numbers of *Solanum laciniatum* (Kangaroo-apple) in what could be described as a classic Rosebay Willowherb site. It was unknown (and definitely unwanted) by the Assistant Head Gardener at the time. A photocopy of the voucher specimen, A.A. Butcher 76, is reproduced here, together with a scan of the basal leaves

Clement & Foster's *Alien Plants of the British Isles* (1994) list references to full descriptions and a further six illustrations! This species is distinguished from its close allies by a combination of characters: an erect annual or short-lived perennial; leaves sessile, unlobed, finely dentate; involucre bracts (7)8(10), glabrous, 4.5-6.5mm; ray florets absent; achenes 1.8-2mm, with 1-2(3) rows of hairs on the ribs.

Clearly this plant has been established on Tresco for at least five years and a future spread seems very probable.

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

PEANUTS!

Plants of peanut (*Arachis hypogaea* L.) have been cropping up 'in the wild' surprisingly frequently in the last few years. I presume more unroasted nuts are being sold as pet food and maybe are being put out to encourage squirrels/badgers/foxes into our gardens.

In September 2002 Debbie Allan *et al.* found 4 plants at Lee-on-Solent (S. Hants) alongside a newly constructed cycle-way. Other interesting aliens were also present (incl. *Amaranthus blitum* (Guernsey Pigweed) and lots of *Chenopodium glaucum* (Oak-leaved Goosefoot)), suggesting that top soil from an old dump may have been imported here. None of these plants reappeared in 2003 amongst the new-sown *Lolium perenne* (Perennial Rye-grass).

Also, in 2002, Dr. A. Powling and I found one plant in Portsmouth (S. Hants) at the base of a planted tree outside Charles Dicken's historical home. All the above records were of non-flowering plants.



Photocopy of voucher specimen of *Senecio minimus* from Tresco with basal leaves inset.

John Hodge tells me that he found a vagrant plant in his garden (Surbiton, Surrey) in 2003 which flowered but had germinated too late to fruit. Interestingly, the peanut shell was found beside the plant suggesting that it had been brought into the garden by a squirrel rather than being a component of bird-food that he regularly puts out in the garden.

Arachis is very distinctive, even in leaf – the 4 paripinnate broad leaflets at ground level exclude all other British plants, including all regular aliens. Are members overlooking this interesting plant? – Stace's *New Flora* (2nd ed., 1997, p.401) refers to it very briefly.

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CAMPANULA INCURVA ESTABLISHED IN E. GLOUCS

Many botanists have visited Stow on the Wold (E. Gloucs, v.c. 33) to see the most unusual assortment of alien plants on a rocky roadside bank of the A429 just north of the village. Although deliberately sown, several garden plants have made a home here since before 1995. Three fine patches of a *Campanula* were seen in flower here by A. Underhill (July 1995), by Mrs E. Norman (Aug. 1998) and by others since then. A wide variety of names were applied to it – but none were correct.

In 2003 I eventually matched a specimen (**herb. EJC**) in **BM** with *C. incurva* Aucher ex A.DC., an endemic of E. Greece. It resembles *C. medium* L. (Canterbury-bells) in several characters, but its habit is widely-spreading from the base, and the stigmas number only 3 (not 5). It is a biennial or short-lived perennial.

Delf Smith (DPJS) has once again provided us with a stunning line drawing which captures the jizz of the plant splendidly in spite of being drawn from a lifeless pressed specimen. The plate shows:

- | | |
|--------------------------------------|---------------------|
| A Habit of plant | E Stamen |
| B Basal leaf | F Fruit (a capsule) |
| C Calyx lobe (with basal appendages) | G Seed |
| D LS of flower | |

The flowers are milky-blue, well captured in the award-winning coloured photograph in *Quart. Bull. Alpine Garden Society* 67(2):163 (June 1999). This species is growing in popularity (see *RHS Plant Finder* 2004-2005), and more self sown plants may soon appear outside gardens.

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CRASSULA HELMSII QUESTIONNAIRE

Despite it being widely recognised that *Crassula helmsii* (New Zealand Pigmyweed, hereafter referred to as *Crassula*) can cause harm to wetland ecosystems, there is very little published evidence from scientific studies relating to the mechanisms of its spread, competitive strategies or the effects of *Crassula* control treatments on non-target plant communities. During my PhD, I have been gathering detailed information from both field and laboratory investigations into the effects of *Crassula* invasion and control measures used to tackle the weed. I decided it would be highly valuable to also gather information for use in my thesis from people with field-based experience of *Crassula*, and in February of 2003 I circulated a questionnaire to assess perceptions of the impact of the plant and control measures at sites across the UK. I made an appeal for help through *BSBI News* and the BSBI website, and the questionnaire was also sent out to Vice-county recorders and some of the regional English Nature teams. My thanks are extended to all of the 39 people who kindly took the time and effort to participate, and to all those who helped me to design and distribute the questionnaire. Here is a summary of the survey findings.

There was a large range of field-based experience of *Crassula* amongst questionnaire participants, with the number of sites viewed per person ranging from 1 to 250 sites. Most people, however, had seen it growing in less than 10 sites and only two participants had never seen *Crassula* growing in the wild.



Campanula incurva del. D.P.J. Smith © 2004

There was a strong belief that *Crassula* is continuing to spread to an increasing number of sites, which is of course supported by historical and recent records held by the BSBI. Not surprisingly, the common view of *Crassula* is a very negative one – not one participant believed it to benefit UK ecosystems in any way. This negative view is also reflected in their commonest belief that *Crassula* suppresses the growth of other plants (although one participant from Scotland did not think this to be the case yet, where they had seen it growing). Most people agreed that its impact on native plants is mostly due to its physical presence, that *Crassula* is so successful at overgrowing its neighbours. However other competitive strategies suggested were impacts on the germination of other plant seed, and *Crassula*-driven changes to water chemistry.

I was interested to find out if any respondents could provide experience of plant species' loss from sites, as a result of *Crassula*'s presence, because there are only a few species-specific references in the general literature (see Cockerill, 1979; Dawson and Warman, 1987; Watson, 1999; Watson, 2001). Interestingly, most people could not recall any species being lost completely from a site, specifically because of *Crassula*. In the few instances where *Crassula* had been perceived to cause loss of specific species, those reported to be affected tended to be very uncommon – *Pilularia globulifera* (Pillwort), *Apium inundatum* (Lesser Marshwort), *Elatine* spp. (Waterworts), *Subularia aquatica* (Awlwort) and *Damasonium alisma* (Starfruit) were all mentioned. Small emergents were highlighted as the growth form most at risk, and other species suggested to be at risk included *Callitriche* spp. (Water-starworts), *Ceratophyllum demersum* (Rigid Hornwort) and *Ranunculus baudotii* (Brackish Water-crowfoot).

Last of all, I was interested in finding out more about the impacts of control measures used to tackle *Crassula* on non-target plant communities, as well as finding out how effective these treatments on *Crassula* removal were perceived to be. Of all of the participants who had seen treatments being used to control *Crassula*, most of them had seen physical removal being used, which is very interesting as it's the technique most commonly advised against! Following physical removal, treatment using herbicide was also a commonly observed method, followed by others such as the use of shading materials, liquid nitrogen application, burning, raking from canal bottoms and infilling of invaded ponds. Despite this huge range in control techniques witnessed by participants, the most common response by far was that the methods were only partly effective at controlling *Crassula*. Unfortunately, they seemed to be very effective at causing a lot of damage to non-target plant communities – although these impacts were not always permanent. I was interested to find out exactly what the impacts were of these treatments on non-target plant communities. In a lot of cases, survey respondents reported that all the vegetation was completely lost from sites due to *Crassula* control measures. It was reported that an 'overkill' was often deemed necessary – removing all vegetation with the *Crassula* – leading to (hopefully) the eventual recovery of other plant species. In one particular case, *Lythrum portula* (Water-purslane) was lost from a site due to misidentification by the land manager, demonstrating that there can still be problems with *Crassula* identification. Seeing as control treatments are usually deemed as only being partly effective at removing *Crassula*, it strikes me how important early detection and rapid response to an invasion really is, because when *Crassula* becomes established, control measures are very likely to devastate plant communities, albeit temporarily in a lot of cases.

For more information about the questionnaire or any aspect of my research, please contact me using the details below.

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- SAMANTHA J. LANGDON, Department of Biological Sciences, University College Chester, Parkgate Road, Chester, CH1 4BJTel.: 01244 375444 x 3848; email: s.langdon@chester.ac.uk

GNAPHALIUM COARCTATUM, NEW TO GUERNSEY AND THE BRITISH ISLES

Last Summer (2003) Graham Le Tissier noticed an unusual plant growing in his neighbour's lawn. Local botanists were shown it, but the closest we could get was Marsh Cudweed, *Gnaphalium uliginosum*. However, as this does not occur in Guernsey, none of us was very familiar with it, and it did not seem to fit exactly. Therefore, a specimen was sent first to Francis Rose, who recommended sending it to Eric Clement. Eric named it *Gnaphalium coarctatum* Willd., which is often 'lumped' as *G. purpureum*. Eric says 'The spicate cudweeds are a weedy group of plants mostly originating in America, and there is little agreement on the limits of the species. *G. coarctatum* Willd. from S. America is one of the most successful colonizers, now established as far away as Sri Lanka, Australia, and New Zealand (where it is known as Purple Cudweed). It is often wrongly named as *G. spicatum* Lam. (1788), but this name is predated by a different plant also called *G. spicatum* Mill. (1768), and so it should never be used for our plant that is very likely to spread widely on Guernsey and beyond. A voucher has been deposited in La Société Guernesiaise Herbarium, and **Herb. EJC.**' (pers. com.)

Each plant spreads out from a small rosette, the flowering spike becoming erect and reaching about 12cm in height. The leaves are simple, greyish above, and white beneath, due to a thick, white tomentum, which also clothes the stems. Each flower head appears to be a dark brown, but once the individual tubular florets are dissected, they are seen to be pale yellow, with bright yellow anthers, and deep purple tips to the petals. See cover drawing, photo 8 in colour section, plate 3 and photo of herbarium specimen on p. 54.

This year (2004) it has again appeared in the lawn, at least 20 plants, as last year. The owner has been looking after it, and not cutting the grass before it has set seed (in June). It is interesting to note that the owner's son visited South America a few years previously.

It remains to be seen whether it will spread as Eric suggests.

BRIDGET OZANNE, Les Mouettes, Pont Vaillant, Vale, Guernsey GY6 8BU

NOTICES (BSBI)

HOW MANY BRISTOL WHITEBEAMS ARE THERE?

Saturday 2 October 2004. 11 a.m. - 4 p.m.

The Bristol whitebeam (*Sorbus bristoliensis*) is a very rare endemic confined to the rocks and wooded slopes of the Avon Gorge, Bristol, but how many trees are there?

The Bristol whitebeam was first found at Stokeleigh Camp in 1852, but only the one tree was known until A. Ley found five more in 1901. J.W. White found more again in 1902. One tree was first discovered on the Clifton side in 1909. Bob Russell knew 110 trees in Leigh Woods NNR (1979), and Philip Nethercott two decades later suggested that there were probably about 100 trees mainly on the Leigh Woods side. The total number is probably over 150 trees but no exact census has been carried out. The problem is seeing the trees for the wood!

Come and join us for a survey on Saturday 2 October 2004, 11 a.m. Meet at the footpath entrance into Leigh Woods off North Road (c. ST555.731). It is best not to park on North Road itself, but in the small roads to the south which are more overlooked, and do not leave anything visible or valuable in the car.

Please bring GPS for plotting exact locations of the trees (if available), spare GPS batteries, a tape measure for measuring girths, binoculars for checking canopy leaves and fruits, digital cameras (if you have them) for location shots, plastic bags for vouchers, a compass, waterproofs, strong walking boots, and lunch. Some valley sides are quite steep but we will not be searching the cliffs. Some areas have quite a lot of brambles.

No need to book, just turn up! Any queries please contact Tim Rich, National Museums & Galleries of Wales, Cardiff CF10 3NP; tel: 02920 573218; email: tim.rich@nmgw.ac.uk

LIBBY HOUSTON, LIZ McDONNELL, BILL MORRIS AND TIM RICH



Herbarium specimen of *Gnaphalium coarctatum* from Guernsey, photo B. Ozanne © 2004

EXCURSION TO THE CZECH REPUBLIC, APRIL 26TH – MAY 6TH, 2005

We now have further details of this excursion which was first advertised in the last issue of BSBI News.

We fly to Prague and for our first few days will be based in Pruhonice, just south east of Prague and from where we will visit sites of botanical interest by coach.

Our leader, Dr Franta, Krahulec is based at the Institute of Botany, Academy of Sciences of the Czech Republic which is housed in a splendidly turreted castle in the park of Pruhonice which is the biggest arboretum in the country covering 240 hectares. There is a wealth of good botanists in the Czech Republic who will hopefully share their knowledge with us during our stay both in the field and the lecture hall.

There are good Hornbeam and Oak forests with many geophytes in this Bohemian karst area and also Beech forests of submontane character. See photos 1-3 in colour section plate 2.

The basaltic steppe communities on Rana hill are rich in *Stipa* and *Astragalus* and on thermophilous grasslands species of submediterranean character, *Quercus pubescens*, *Linum flavum* and *Globularia vulgaris* are to be found.

For the second part of our stay we will move to Mikulov, on the edge of the Palava protected area with rich grassland on limestone where *Adonis vernalis*, *Iris aphylla* and *Hesperis tristis* grow. Here, too, we will see floodplain forests and meadows near the confluence of the Morava and Dyje rivers and in the Bílé Karpaty Mountains, a herb rich forest of the Carpathian type, are many orchids and *Hacquetia epipactis*.

In addition, it is hoped that there will be time for an afternoon in Prague, a visit to Kuna Hora, a late Gothic town in the Jagiellonian style and a visit to a wine cellar in Mikulov.

Accommodation will be in small hotels or pensions and should be in the region of £30/40 for a double room but meals are very reasonable and beer is really cheap!!

It is envisaged that you would book your own flights to Prague and arrange your own travel insurance. We are liaising with a travel agent in Prague who will be helping us with coach transport during our stay.

Participants should be fit as there will be hill-walking in rocky areas.

Please apply for a place on this excursion by the end of November at the latest, enclosing a stamped addressed envelope.

JANE CROFT, BSBI Field Secretary, 12 Spaldwick Rd, Stow Longa, Huntingdon PE28 0TL

EXCURSION TO THE CATALAN PYRENEES – JUNE 2005

Following the success of this year's field meeting in the Picos de Europa (see report on page 66 of this issue), Teresa Farino would like to hear from any members who might like to join a similar trip to the Cadí-Moixeró natural park, in the eastern Spanish Pyrenees, in June 2005.

The Segre river valley, between La Seu d'Urgell and Puigcerdà, offers a wide range of habitats – rock-gardens, peat-bogs, alpine meadows and forests of beech, Scots pine and European silver-fir – hosting a rich flora. To the south lies the fabulous limestone buttress of the Serra del Cadí, rising to 2,647m, while the northern flank of the valley – abutting the border with Andorra and France – comprises granites and shales reaching almost 3,000 metres. See photos 4-6 in colour section, plate 2.

The flora at this time of year is spectacular, including such gems as *Pulsatilla alpina* subsp. *apiifolia*, *Moneses uniflora*, *Sempervivum tectorum* and *S. montanum*, *Saxifraga longifolia*, *S. media*, *Gentiana pyrenaica* and *G. burseri*, *Salvia pratensis*, *Scutellaria alpina*, *Ramonda myconi*, *Campanula persicifolia*, *speciosa*, *Anthericum liliago*, *Nigritella nigra* and *Epipactis palustris*. Butterflies abound, and we can expect such emblematic mountain birds as lammergeier, golden eagle and alpine chough, with bee-eater, woodchat shrike and golden oriole in the valley bottom. Alpine marmot and isard (Pyrenean chamois) can also be seen here.

The excursion will run from Saturday 18 June to Saturday 25 June 2005 (8 days/7 nights), with the pick-up about lunch-time on 18th from Barcelona airport. We will be staying in a family-run hotel in Prullans de Cerdanya, with both open-air and indoor swimming pools. The cost will be 970 euros (plus

130 euros single-room supplement), which is about £650 at the current exchange rate, to cover half-board accommodation, picnic lunches, transport by minibus throughout and services of the leaders (principal leader Teresa Farino), but excluding flights and travel insurance (obligatory). Participants must be fit for mountain walking.

For more details, contact:

TERESA FARINO, Apartado de Correos 59, 39570 Potes, Cantabria, Spain; tel. 00 34 942 735154;
email: teresa@iberianwildlife.com

NOTICES (NON-BSBI)

NATIVE FLORA FOR THE FUTURE

Flora locale is proud to be hosting a conference, 'Native flora for the future' on 12-13th April 2005. Held in Reading, this two-day event hopes to unite the farming, forestry, scientific and landscaping communities.

The conference aims to concentrate on the issues surrounding the sourcing of planting stock for habitat restoration and creation projects. This will include practical advice on growing and using native flora and the policies involved.

Guest speakers include Joanna Francis, George Peterken, Sue Everett, Scott Wilson, Jon Marshall and representatives from Defra, Landlife, the National Forest Company, the Woodland Trust and the Forestry Commission.

We are also inviting poster presentations to enhance the conference. Posters are welcome from all organisations and individuals with an interest in the use of British native origin plants.

If you would like to submit a poster, and/or attend THE native flora conference of 2005 then please contact log onto www.floralocale.org for details. This conference, at a mere £65 per day is a bargain not to be missed, make sure you book early to avoid disappointment!

LIZ MANLEY, Conservation and Development Manager, Flora locale, Denford Manor, Hungerford, Berks., RG17 0UN

REQUESTS

DARWIN'S PASSIONFLOWERS

I'm currently writing a book that looks at the history of biology through some of the experimental organisms that have been important. I want to begin with something on Darwin's botanical researches and am thinking of choosing passionflowers, since he discusses them in his books on fertilisation and on movement in plants, as well as referring to them in passing in *The Origin of Species*, and *The Variation of Animals and Plants under Domestication*.

As far as I have been able to discover, nothing has been published on this subject (Mea Allan's '*Darwin and his Flowers*' doesn't mention passionflowers), but I'm wondering if anyone who reads this list might know of any articles or books that I've overlooked?

I'm also interested in looking at the enthusiasm for passionflowers in Victorian Britain more generally, so if anyone has suggestions about that, I'd be extremely grateful.

JIM ENDERSBY, Research Fellow, Darwin College, University of Cambridge, Silver Street, Cambridge, CB3 9EU

DIGITAL CAMERA HELP NEEDED

Since buying my digital camera I do not seem to have had a single shot that I would consider to be in focus, had it been with my old SLR, despite my having been assured that this was a reasonably good camera - Sony Cyber-shot DSC P-92. Perhaps somebody in the know could advise us all through 'News' on the ins and outs of digital: personally the impression I get is that, for this camera at least, the shutter speeds are slower than for an equivalent shot on a film SLR, and that auto focus and viewing screen are no substitute for eyeballing the subject properly through the lens and focussing manually.

STEVE HAWKINS, 60 Peartree Road, Stopsley, Luton, Beds, LU2 8BA

CYSTOPTERIS MONTANA ON SKYE

Both the 1st edition (1952) and 2nd (1962) of Clapham, Tutin & Warburg's *Flora of the British Isles*, state *Cystopteris montana* (Mountain Bladder-fern) is present on Skye, I have not been able to trace the source of this statement and would be grateful if any reader could help me.

MIKE TAYLOR, Westlea, Kyleakin, Isle of Skye IV41 8PH. Tel: 01599 534391.
email: mike@skye6.fsnet.co.uk

OFFERS

BSBI JOURNALS AVAILABLE

Do botanists still collect books as well as plants?

I have a complete set of every periodical publication from the society since 1932, including the very rare *Botanical Exchange Club Reports* from the early 1940s. The journals (*Rep. BEC*, *Watsonia*, *Yearbook*, *Proc. BSBI*) up to 1969 are all bound. After 1969 (*Watsonia*, *BSBI News*, *Yearbooks*, *BSBI Abstracts*) they are unbound. The collection occupies three cardboard cartons (16" x 12" x 11"). Free to any botanist or library who will pay the cost of transportation from Canada.

Also available: all the early (pre-1975) BSBI conference reports (free, to a good home), and many late 19th and early 20th century botanical classics. Send me a letter or an email if you are interested.

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A LIST OF OFFPRINT PAPERS BY DR S.M. WALTERS AVAILABLE WHILE STOCKS LAST

1. *Alchemilla vulgaris* L. agg. in Britain. *Watsonia* 1: 6-18. 1949
2. On *Arabis turrata* L. in the Fellows' Garden. *The Eagle* 54: 148-50. 1950
3. *Alchemilla subcrenata* Buser. in Britain. *Watsonia* 2: 277-278. 1952
4. *Eleocharis mamillata* Lindb. Fil. & allied species. *Ber. Schweiz. Bot. Ges.* 63: 271-286. 1953
5. Distribution Maps of the British Flora. *Nature* 173: 1079. 1954
6. The Distribution Maps Scheme. *Proc. Bot. Soc. Brit. Is.* 1: 121-130. 1954
7. Sur quelques plantes recoltées dans le Nord-Ouest de la France. *Le Monde des Plantes* 1954: 303-314. 1954
8. Notes on the Flora of Cambridgeshire (with F. Perring & P.D. Sell). *Proc. B.S.B.I.* 1: 471-481. 1955
9. A Reconsideration of *Silene caelata* C. Reid. (with C M Lambert). *New Phytol.* 55: 133-135. 1955
10. *Selinum carvifolia* (L.) L. in Britain. *Proc. B.S.B.I.* 2: 119-122. 1956
11. Distribution Maps of Plants - A historical survey. In 'Progress in the Study of the British Flora' ed. J.E. Lousley. pp. 89-96. 1957
12. Botanical Classification. *Aslib. Proc.* 14: 231-233. 1962
13. *Atlas of the British Flora* (short description of the project) *Countryside* 19: 8. 1962
14. The Nomenclature of *Alchemilla minor* auct. Brit. (with M.E. Bradshaw & P.D. Sell). *Watsonia* 5: 259-261. 1963
15. Botanical Nomenclature, Punched Cards and Machines - a Comment. *Taxon* 12: 249-250. 1963

16. Abstracting and Indexing Data. *Webbia* **18**: 19-22. 1963
17. *Eleocharis austriaca* Hayek. – a species new to the British Isles. *Watsonia* **5**: 329-335. 1963
18. Flora Europaea Notulae: *Silene* (with A.O. Chater). *Feddes Repert.* **69**: 44-57. 1964
19. Principles of Taxonomy. In 'Developments in Industrial Microbiology' **5**: 169-172. 1964
20. Introduction to General Discussion on 'Phenetic and Phylogenetic Classification'. *Syst. Assn.* Publication No. 6: 157-164. 1964
21. Improvement versus Stability in Botanical Classification. *Taxon* **14**: 6-10. 1965
22. The Scientific Importance of Upper Teesdale (with H. Godwin). *Proc. B.S.B.I.* **6**: 348-351. 1967
23. Identification of British *Eleocharis*. *Proc. B.S.B.I.* **6**: 384-386. 1967
24. Notes on Slovakian Plants (with P.D. Sell). *Acta F.R.N. Univ. Comen. Botanica* **14**: 13-19. 1968
25. Cambridgeshire Ferns – Ecclesiastic and Ferroviatic. *Nature in Cambridgeshire*. **12**: 22-25. 1969
26. Report on Index to European Taxonomic Literature. V. Simposio de Flora Europaea, *Sevilla*: 11-13. 1969
27. Studies in *Potentilla anserina* L. (with D.J. Ockendon). *Watsonia*. **8**: 135-144. 1970
28. Dwarf Variants of *Alchemilla* L. *Fragm. Flor. Geobot.* **16**: 91-98. 1970
29. Studies in *Potentilla* L. III. Variation in British *P. tabernaemontani* Aschers. and *P. crantzii* (Cr.) Beck ex Fritsch (with G.L. Smith & V.Z. Bozman). *New Phytol.* **70**: 607-618. 1971
30. Index to Rare Endemic Vascular Plants of Europe in 'VI Symposium of Flora Europaea'. *Boissiera*. **19**: 87-89. 1971
31. Flora Europaea Notulae: *Veronica* (with D.A. Webb). *Bot. Journ. Linn. Soc.* **65**: 266-269. 1972
32. A Contribution to the Study of the Flora and Vegetation of the Budva area, Montenegro (with P. Adam & H.J.B. Birks). *Glas. Repub. Zavoda Zast. Prir. Muz. Titograd.* **4**: 41-72. 1972
33. *Alchemilla* (in gardens) in 'Plants: Wild and Cultivated', ed P.S. Green: 48-50. 1973
34. The Role of Botanic Gardens in Conservation. *Journ. R.H.S.* **98**: 311-315. 1973
35. The Rediscovery of *Senecio paludosus* L. in Britain. *Watsonia* **10**: 49-54. 1974
36. Some British Chromosome Counts in the Compositae subfamily Cichonoideae. (with J.M. Edmonds & P.D. Sell). *Watsonia* **10**: 159-161. 1974
37. Traditional Methods of Biological Identification. (Historical Introduction). In *Systematics Association Special Vol. 7. – Biological Identification with Computers* ed. R.J. Pankhurst. Academic Press, pp. 3-8. 1975
38. The Role of European Botanic Gardens in the Conservation of Rare and Threatened Plant Species. *Gartnerisch – Botanischer Brief. Hamburg.* **51**: 2-22 *et al.* 1977
39. Conservation of the European Flora : *Aldrovanda vesiculosa* L. – a documented case history of a threatened species. In 'Systematic Botany, Plant Utilisation and Biosphere' ed. I. Hedberg, 76-82. 1979
40. Aims and Methods in Mapping. In 'Mapping the Flora of the Balkan Peninsula', ed. S. Kozuharov, 83-94. 1981
41. Varieties of *Viola odorata* L. in Suffolk and Cambridgeshire. (with A.C. Leslie & C.M. Pannell). *Watsonia* **14**: 73-74. 1982
42. The Rediscovery of the Fen Violet, *Viola persicifolia* Schreber, at Wicken Fen Cambridgeshire (with T.A. Rowell & H.J. Harvey). *Watsonia* **14**: 183-184. 1982
43. The occurrence of *Lemma minuscula* Herter, in the British Isles (with A.C. Leslie). *Watsonia* **14**: 243-248. 1983
44. The Relation between the British and the European Floras. *New Phytol.* **98**: 3-13. 1984
45. The Role of Botanic Gardens in Plant Conservation in South-east Asia in 'Conservation of Tropical Plant Resources', pp. 230-235. 1984
46. The problems of wild plant conservation. *Publ. Natuurhist. Gen. Limburg.* **35**: 56-59. 1985
47. The Future of 'Flora Europaea'. *Veroff. Geobot. Inst. ETH. Stiftung Rubel, Zurich.* **87**: 91-99. 1986
48. *Alchemilla*: a challenge to Biosystematists. *Acta Univ. Ups. Symb. Bot. Ups.* **27**: 193-198. 1986
49. Flora Europaea: the Background to the Revision of volume 1. (with J.R. Akeroyd). *Bot. Journ. Linn. Soc.* **95**: 223-226. 1987
50. *Alchemilla gracilis* Opiz, a species new to the British flora. *Watsonia*. **17**: 133-138. 1988
51. Flora Europaea: Notulae Systematicae. Taxonomic Notes on *Silene* L. (with J.R. Akeroyd). *Bot. Journ. Linn. Soc.* **97**: 338-342. 1988
52. The purposes of systematic botany. *Symb. Bot. Ups.* **28(3)**: 13-20. 1988
53. Experimental and orthodox taxonomic categories and the deme terminology. *Pl. Syst. Evol.* **167**: 35-41. 1989
54. Obituary of J.S.L. Gilmour and Two Early papers on Classification (by J.S.L.G. with Foreword by S.M.W.) and List of Publications of J.S.L.G. by W.T. Stearn. *Pl. Syst. Evol.* **167**: 931-112. 1989
55. Flora Europaea: Notulae Systematicae. Ser. 2, 3. *Silene vulgaris* (Moench) Garcke & *S. uniflora* Roth (with A.O. Chater). *Bot. Journ. Linn. Soc.* **103**: 213-216. 1990
56. Professor Maria Skalinska: an Appreciation from England. *Polish Bot. Stud.* **2**: 17-18. 1991
57. W.T. Stearn: the Complete Naturalist. *BHot. Journ. Linn. Soc.* **109**: 437-442. 1992
58. Herbaria in the 21st Century: why should they survive? *Webbia* **48**: 673-682. 1993
59. Four Dwarf Caucasian *Alchemilla*s for the Rock Garden. *New Plantsman* **2(3)**: 185-189. 1995
60. Optimizing the use of herbarium resources. (with D. Hedberg). *Taxon* **45**: 93-94. 1996
61. Conservation of wild plants in botanic gardens: some case-histories. *PlantNet Newsletter* **6**: 19-22. 1997
62. Goethe as Botanist. *Plant Talk* **19 (Oct. 1999)**: 48. 1999

BOOK NOTES

Those that will not be reviewed in *Watsonia* are marked with an asterisk (*). Unattributed comments in square brackets are mine.

**Chequer*. P. Roper. [Pp. 36]. Sage Press, Rye. 2004. Softback. £4.99. ISBN 0-9542297-5-4.

[One of the Collector's series of Trees, little booklets covering botanical, economic, sociological and folklore issues. Other titles include Ash, Box, Holly and about 8 others.]

Flora Hibernica: the wild flowers, plants and trees of Ireland. J. Pilcher & V. Hall. Pp. iv-x + 203.

The Collins Press, Wilton, Cork. 2004. Paperback. £19.99. ISBN 1-903464-51-x.

Nouvelle flore de la Belgique, du Grand-Duché de Luxembourg, du Nord de la France et des régions voisines (Ptéridophytes et spermatophytes). Fifth edition. J. Lambinon, L. Delvosalle & J. Duvi-gneaud. Pp. cxxx + 1167. Jardin botanique national de Belgique, Meise. 2004. Hardback. 48 euros. ISBN 90-72619-58-7.

**The poisoned weed: plants toxic to skin*. D.G. Crosby. Pp. xi + 266. Oxford University Press, New York. 2004. Hardback. £40.00. ISBN 0-19-515548-3.

[An American book, insufficiently relevant to *Watsonia* for review, but containing much technical information on chemicals, reactions, adverse effects and treatment.

If any member would like the copy sent to us (free on payment of postage), please contact me.]

An illustrated guide to British Upland Vegetation. A.M. Averis, A.B.G. Averis, H.J.B. Birks, D. Horsfield, D.B.A. Thompson & M.J.M. Yeo. Pp. 454. Joint Nature Conservancy Committee, Peterborough. 2004. Softback. £25.00. ISBN 1-86107-553-7.

Sussex Wild Flowers. Mary Briggs. Pp. v +214. Sussex Wildlife Trust. 2004. £10, (inc p&p, see below). ISBN 1-898388-17-2.

Available from Sussex Wildlife Trust, Woods Mill, Henfield, W. Sussex, BN5 9SD.

Atlas of British and Irish Brambles. A. Newton & R.D. Randall. Pp. xxx + 98. Botanical Society of the British Isles, London. 2004. £12. ISBN 0-901158-31-3.

Dorset Rare Plant Register – an account of the rare, scarce and declining plants of Dorset. Bryan Edwards & David Pearman. Pp. xviii + 106, with 6 pages of colour photos. Dorset Environmental Records Centre, Dorchester, in conjunction with the BSBI. 2004. £8. ISBN 0-9511394-5-2.

Watsonia Cumulative Index, Volumes 1 to 20, 1949 –1995. Prepared by C.R. Boon. Pp viii + 246. Botanical Society of the British Isles, London. 2004. £ 11. ISSN 0043-1532.

Interactive Flora of the British Isles – a digital encyclopedia on DVD-ROM. Prof C.A. Stace and editors Dr R.van der Meijden and Dr I. de Kort. ETI Biodiversity Centre, University of Amsterdam, Amsterdam. 2004. £32, incl. p&p and VAT. ISBN 90-75000-69-3.

**Catalogue of Botanical Prints and Drawings at the National Museums & Galleries of Wales*. Edited by M.H. Lazarus and H.S. Pardoe. 319pp. Coloured illus. Portraits, etc. Large paperback (4to). National Museum of Wales 2003. £45. ISBN. 0 7200 0525 6.

**Naturalists and Society, the culture of Natural History in Britain, 1700 – 1900*. D.E. Allen. Pp xiv + 298. Ashgate publishing, Aldershot. 2001. £55. ISBN 0-86078-863-6.

[I have done David Allen a disservice! This was sent for review in 2001, and listed here in *Book Notes*. I couldn't find a reviewer, and it was lost in my shelves here. I found it last week when searching for something else, and took it on a train trip and realised what I had missed. It comprises 21 essays, all but two previously published in a wide variety of journals and symposium volumes – 12 in all. They are all reproduced in their original fonts, which is slightly off-putting, but comprise a really interesting and eclectic selection. Titles range from 'Medical education and the rise and spread of the botanical field class', 'Shells, collecting and the Victorians', 'Changing attitudes to nature conservation: the botanical perspective' to 'C.C. Babington, Cambridge botany and the taxonomy of British flowering plants'. Well worth a browse, and I am very pleased to have it, though I feel the price is far too steep.]

*A *Guide to the Flowering Plants and Ferns of Iceland (2nd ed. 1998)* Hörður Kristinsson

[Chris Boon writes on a flora I had not seen. 'I was initially disappointed in this book because it was arranged by colour and not by 'normal' botanical order. In fact the author admits in the introduction that, for the more experienced user, plants of the same genus may be spread throughout the book! As an aid to such people there is an index to families BUT the English family name is used rather than the Latin one – I did not like this as I can never remember the family names, but the list is not too long. Having got over this hurdle I actually found the book very good to use. The colour photographs are excellent and, for every species illustrated, there is a black and white drawing of a characteristic part of the plant, e.g. seed, leaf, etc. There is a good distribution map for all species as well. The descriptions are excellent and quite botanical; a good habitat description; mention of similar species that might cause confusion; flowering times. Also the Icelandic name if you could pronounce it! The cost in UK is rather high at £45, but as a holiday in Iceland is somewhat expensive, this is a small percentage of the overall cost – that was my excuse anyway. However the book was available in Iceland for about 4400 lkr that is about £35'.]

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VICE-COUNTY CENSUS CATALOGUE OF THE VASCULAR PLANTS OF GREAT BRITAIN – ERRATA

The following is a list of Errata so far noticed in the printed *Vice-County Census Catalogue* (Stace *et al.* 2003). The list results mostly from inputting errors and brings the printed version into line with the data held in the BSBI Database (Leicester). It is in no way intended to be an update; updating the VCCC will be carried out via Plant Records in *Watsonia*.

- Page 17 – *Helleborus foetidus*. Delete v.c. 26 alien
- Page 21 – *Ranunculus ficaria*. Delete v.c. 102
- Page 26 – *Papaver rhoeas*. Convert v.c. 75 to post-1969
- Page 29 – *Fumaria densiflora*. Convert v.c. 39 to post-1969
- Page 33 – *Quercus petraea*. Delete v.c. 26 alien
- Page 53 – *Persicaria campanulata*. Delete v.c. 36 casual
- Page 53 – *Persicaria wallichii*. Delete v.c. 36 casual
- Page 55 – *Fagopyrum esculentum*. Delete v.c. 36 casual
- Page 64 – *Elatine hexandra*. Convert v.c. 103 to post-1969
- Page 64 – *Hypericum androsaemum*. Delete v.c. 26 alien
- Page 89 – *Lepidium heterophyllum*. Delete v.c. 26 alien
- Page 104 – *Sedum forsterianum*. Delete v.c. 36 alien
- Page 104 – *Sedum anglicum*. Delete v.c. 62 alien
- Page 158 – *Lathyrus sylvestris*. Delete v.c. 26 alien
- Page 168 – *Lythrum hyssopifolia*. Convert v.c. 30 to post-1969
- Page 177 – *Mercurialis annua*. Convert v.c. 69 to post-1969
- Page 190 – *Scandix pecten-veneris*. Convert v.c. 21 to post-1969
- Page 190 – *Scandix pecten-veneris*. Convert v.c. 40 to post-1969
- Page 204 – *Lithospermum arvense*. Convert v.c. 39 to post-1969
- Page 209 – *Verbena officinalis*. Convert v.c. 70 to post-1969
- Page 216 – *Mentha pulegium*. Delete v.c. 16 alien
- Page 225 – *Linaria repens*. Convert v.c. 8 to post-1969
- Page 245 – *Lonicera xylosteum*. Convert v.c. 30 to post-1969
- Page 255 – *Lactuca virosa*. Delete v.c. 36 alien
- Page 283 – *Hieracium angustatum*. For 65 read 69 70 (native, pre 1970)
- Page 297 – *Chrysanthemum segetum*. Convert v.c. 21 to post-1969
- Page 325 – *Carex hirta*. Convert v.c. 103 to post-1969
- Page 377 – *Dactylorhiza* × *venusta*. Convert v.c. 103 to post-1969

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OBITUARY NOTES

With regret we report the death of Dr S.R.J. Woodell in April this year. Joining BSBI in 1954, Stan had been a member for just 50 years. He was BSBI Referee for Primulaceae from 1980 until this year, and he served on BSBI Conservation Committee for many years. During the 1970s Stan also worked on the biological conservation and management of *Viola persicifolia*, particularly at Woodwalton Fen and assisted by BSBI member Rachel Hamilton. There will be an obituary of Dr Woodell in *Watsonia*.

I am grateful to Arthur Chater who sent a copy of *The Times* Obituary of Francis Partridge, who died in February 2004, at the age of 103. In later life her publications included her autobiography, a biography of Julia Strachey, and her own Diaries which were considered notable achievements. The *Times* Obituary describes Frances Partridge as an 'expert botanist' and records that in 1942 she was commissioned by Allen Lane to produce a 22-Volume British Flora which was to be illustrated. After 7 years work the contract was cancelled. Does any member recall any details of this proposed, but aborted Flora?

MARY BRIGGS, Hon. Obituaries Editor, 9 Arun Prospect, West Sussex, RH20 1AL

REPORTS OF FIELD MEETINGS – 2004

Reports of Field Meetings (with the exception of Reports of Irish Meetings written by Alan Hill) are edited by, and should be sent to: Dr Alan Showler, 12 Wedgwood Drive, Hughenden Valley, High Wycombe, Bucks, HP14 4PA, Tel.: 01494 562082. Potential authors of reports should note that they should not be much longer than 500 words (half a page of *News*) for a one day meeting and 1000 words (1 page of *News*) for a weekend.

GREAT ORME, LLANDUDNO, CAERNS. (v.c. 49) 17th. April

In the midst of an otherwise lengthy cold spell, this meeting was blessed with fine sunny weather, and we began by examining a patch of *Erodium moschatum* (Musk Stork's-bill), flowering obligingly on the green which was our meeting place. Following a short walk, we arrived at the limestone quarry wastetips which support the largest population of *Hornungia petraea* (*Hutchinsia*) on the Great Orme. Here members also found other early spring annuals such as *Cerastium diffusum* (Sea Mouse-ear) and *Stellaria pallida* (Lesser Chickweed) and some people remarked that it was good to see *Cochlearia danica* (Danish Scurvygrass) in a native site as opposed to a busy roadside! Much interest was shown in two rare hawkweeds, *Hieracium cambricum* and *H. britanniciforme*, even though they were only in bud.

Moving down to the cliffs at Ty Gwyn, we were pleased to find a third one, *Hieracium pseudoleyi*, in full flower and lower down the cliffs than usual, enabling examination by those who wished.

We continued down to a craggy outcrop above Happy Valley where *Minuartia verna* (Spring Sandwort) studded the grassland and a few early flowers of *Helianthemum oelandicum* subsp. *incanum* (Hoary Rock-rose) had just opened. Tiny eyebrights brought the usual question 'which one is it?' and the answer, *Euphrasia confusa*, was provided by Sam Thomas.

After lunch, the party descended down a winding path to search for *Veronica agrestis* (Green Field-speedwell), *Sisymbrium orientale* (Eastern Rocket), *Brassica oleracea* var. *oleracea* (Wild Cabbage) and a large variety of *Catapodium rigidum* (Fern-grass) with panicle branches spreading in 3 dimensions, recognized in Stace as var. *majus*. On a grassy bank, members admired the striking blue flowers of a well-naturalized patch of *Anchusa azurea* (Garden Anchusa) and, returning up the path, a Morel fungus was of interest to many. Passing a small colony of *Ranunculus auricomus* (Goldilocks Buttercup), we climbed up to the iron-age hill-fort of Pen y Dinas, where we were able to compare a very few plants of *Cerastium semidecandrum* (Small Mouse-ear) with the much more abundant *Cerastium*

pumilum (Dwarf Mouse-ear), with its bigger, showier flowers and less-scarious bracts. This nationally-scarce plant has benefited from the recent clearance of invasive species such as alien *Cotoneasters* & *Arbutus unedo* (Strawberry-tree) from two sites on the Great Orme. There was much *Myosotis ramosissima* (Early Forget-me-not) in the open dry grassland and under trees we saw *Viola reichenbachiana* (Early Dog-violet) and *Adoxa moschatellina* (Moschatel). The brilliant yellow flowers of *Potentilla neumanniana* (Spring Cinquefoil) caught our eye, and were pleasing to see as it had not been in flower two days earlier.

Passing through the woods at Haulfre, we saw the enlarging leaves of *Viola odorata* (Sweet Violet), inspected *Veronica polita* (Grey Field-speedwell) to see how it differed from the *V. agrestis* seen earlier, and looked in vain for seeds on *Valerianella carinata* (Keeled-fruited Cornsalad) which was however only just in flower. By the time we emerged out onto the open hillside again, the weather had deteriorated and it had become windy and much colder. Other species benefiting from scrub clearance here were *Viola hirta* (Hairy Violet) and *Arabis hirsuta* (Hairy Rock-cress), and we looked at some ancient gnarled Juniper bushes and wondered just how old they might be. At this point, the meeting officially ended, but several participants decided to stay for the final optional walk to see non-flowering rosettes of *Hyoscyamus niger* (Henbane). This has been recorded for over 100 years on the Great Orme but, of course, only appears in years following ground disturbance and several years may pass in-between sightings. The present colony of 10 plants germinated last autumn, was promptly demolished by some of the herd of resident feral goats (apparently with no ill-effects) but recovered and is about to flower this summer.

The number of participants on this meeting far exceeded my expectations and I would like to offer my apologies to the members I had to turn down. I would especially like to thank John Benson & Ted Phenna, both of whom helped to ensure that everyone saw most of the plants on the species list distributed at the start of the meeting.

WENDY MCCARTHY

GORS MAEN LLWYD AND LLYN BRENIG, DENBIGHSHIRE (v.c. 50) 19th June

Gors Maen Llwyd is a 600 acre nature reserve of the North Wales Wildlife Trust managed with a minimum of interference and lightly sheep-grazed. It is heather moorland with flushes, streams and the lake shore, Llyn Brenig was created in the 1960's as a reservoir to top up the River Dee in times of drought.

13 of us met and looked over a grassy mound, possibly a burial site. We found *Viola lutea* (Mountain Pansy) and *Conopodium majus* (Pignut). Following the stream we found *Eleogiton fluitans* (Floating Club-rush), *Myriophyllum alterniflorum* (Alternate Water-milfoil) and *Callitriche hamulata* (Intermediate Water-starwort). On the banks were *Oreopteris limbosperma* (Lemon-scented Fern), with *Dryopteris dilatata* (Broad Buckler-fern), *D. carthusiana* (Narrow Buckler-fern) and their hybrid, *D. × deweveri*. In an adjacent flush were *Eleocharis quinqueflora* (Few-flowered Spike-rush), *Pinguicula vulgaris* (Common Butterwort), *Drosera rotundifolia* (Round-leaved Sundew) and *Triglochin palustre* (Marsh Arrowgrass). The sheep prefer short grass to rushes, leaving swathes of *Juncus effusus* (Soft-rush), *J. inflexus* (Hard-rush) and their hybrid *J. × kern-reichgeltii*, also *J. bulbosus* (Bulbous Rush) and *J. acutiflorus* (Sharp-flowered Rush). The uncommon *Galium uliginosum* (Fen Bedstraw) was also found.

During the day we identified 17 sedges, including *Carex dioica* (Dioecious), *C. echinata* (Star), and their hybrid *C. × gaudiniana*, *C. hostiana* (Tawny), *C. viridula* subsp. *oedocarpa* (Yellow-sedge) and their hybrid, *C. × fulva*. A new record was *C. paniculata* (Greater Tussock-sedge) and we were surprised to find only one clump of *C. binervis* (Green-ribbed Sedge) but many plants of *Luzula pilosa* (Hairy Wood-rush). This may be a remnant of ancient woodland as it is said that early man lived on this site until all the wood was cut down, and then moved to the valleys to find fuel. There is the remnant of a hill fort here.

After lunch we looked at the bare lake-shore. *Littorella uniflora* (Shoreweed), strands of *Carex rostrata* (Bottle Sedge) in the bay and a fragment of *Ranunculus peltatus* (Pond Water-crowfoot) were noted and there were strands of *Nitella* sp. (a stonewort) in deeper water. On our return we found *Vaccinium oxycoccos* (Cranberry), *Eriophorum vaginatum* (Hare's-tail Cottongrass), *E. angustifolium* (Common Cottongrass) and more *Triglochin palustre*.

At the end of the afternoon we looked at a fenced (sheep-less) strip where *Lycopodium clavatum* (Stag's-horn Clubmoss) is established. Several willows have seeded, including *Salix caprea* (Goat Willow), *S. aurita* (Eared Willow), *S. cinerea* (Grey Willow) and hybrids. We had a pleasant day of easy walking and interesting plants. We also saw two Adders!

JEAN A. GREEN

ETTINGTON, WARWICKSHIRE (v.c. 38) 20th June

Twelve people attended on a day with cloud, and sunny periods. The first port of call was the roadside cuttings at Ettington, where a scattered colony of *Ophrys apifera* (Bee Orchid) was found, including some tall specimens. I was worried about finding var. *bicolor* still in flower, due to recent hot periods, but thanks to a tip off we found one plant with one floret still intact. Also found on the cuttings were *Anacamptis pyramidata* (Pyramidal Orchid) and *Carex hirta* (Hairy Sedge).

On the roundabout itself were *Malva moschata* (Musk Mallow), *Filipendula vulgaris* (Dropwort) and (where I have not seen it before) a good colony of *Ophioglossum vulgatum* (Adder's-tongue Fern). Nearby, on a lay-by at Pillerton Priors, we had a colony of 12 plants of *Salvia pratensis* (Meadow Clary), all of which had been mown off except one, directly under a road sign, which had finished flowering. People are just too tidy! At Weston Mill, near Cherington, we met a good friend, Paul Mariot, who kindly showed us *Aconitum napellus* (Monkshood) on a river embankment. Sadly, it had passed its best but Paul pointed us to a bigger population in a copse ½ mile away along the riverside. Here we found the Monkshood in full flower but all the plants were well hidden by *Galium aparine* (Goosegrass) which was smothering them. However, Paul cuts the rubbish away from one clump of Monkshood each year to give it a chance and this was the first plant we were shown by the bridge. Well done to Paul! *Ranunculus arvensis* (Corn Buttercup) occurs close by, but the crop in the field in 2004 was wheat so there was no Corn Buttercup this year because of herbicides. Last year I saw many plants, when the crop was beans. Paul told us herbicides cannot be used on a bean crop, which in turn gives our arable weeds a chance, for once!

After lunch we went down the Fosse Way to Stretton on Fosse. On the nearby verge we had 7 plants of *Ophrys apifera* var. *trollii* (Wasp Orchid) in full flower. I hope to cut the verge, with help from other botanists, later this year as elm suckers are appearing on the verge in places. By the time we reached Combrook there were 6 members left. An added bonus and a pleasant surprise was a plant of *Euphorbia platyphyllos* (Broad-leaved Spurge) in a farm gateway. I have seen this species only a few times in Somerset. Further along the cornfield edge, species that showed up included *Euphorbia exigua* (Dwarf Spurge) in good numbers and a few plants of *Viola arvensis* (Field Pansy). A nearby hedgerow verge had again a few plants of *Ophrys apifera* (Bee Orchid) and also *Dactylorhiza fuchsii* (Common Spotted-orchid). The next cornfield was set-aside but had been sprayed, but six seedlings and young plants of *Althaea hirsuta* (Rough Marsh-mallow) were found unsprayed. Since the herbicide had cleared the ground of other common weeds, the mallow could have a chance to flower this year. This is what happened in 2001, when I found 100 seedlings and plants. The Rough Marsh-mallow has been known here at this site since around 1998.

The last stop of the day was Moreton Morrell, where a farm ditch produced a number of *Scrophularia umbrosa* (Green Figwort) in bud. One small plant was reported here in 1993 but thanks to the farmer, who cleared one of his ditches out, I found over 30 plants in 2002. The ditch clearing must have opened up the seed bank and it was good to see the figwort still there.

I must thank everyone who came along to my first BSBI meeting and I hope to lead more in the future.

BRIAN LANEY

BOWLAND, LANCASHIRE (v.c. 64) 26th - 27th June

Eight members attended part or all of this meeting aimed at exploring a relatively little known area of England.

The first morning was spent exploring part of Gisburn Forest and the draw down zone of Stocks Reservoir built in the 920s. The forest was planted with conifers (mostly *Picea abies* (Norway Spruce) and *P. sitchensis* (Sitka Spruce)) in the 1930s and until recently the estate was kept private. However, access roads have been developed, often paved with limestone chippings and way-marked routes introduced for the public to enjoy the forest. The party followed these tracks and enjoyed the abundance of *Dactylorhiza fuchsii* (Common Spotted-orchid) and puzzled over the numerous willow species and hybrids. The highlight was examining a flush that had remained unplanted and that supported *Carex hostiana* (Tawny Sedge), *C. pulicaris* (Flea Sedge), *C. viridula* subsp. *oedocarpa* (Yellow Sedge), *Parnassia palustris* (Grass-of-Parnassus), *Pedicularis sylvatica* (Lousewort), *Pinguicula vulgaris* (Common Butterwort), *Primula farinosa* (Bird's-eye Primrose) and *Salix repens* (Creeping Willow). At Stocks Reservoir the group was able to see the characteristic draw down zone flora of *Juncus filiformis* (Thread Rush), *Littorella uniflora* (Shoreweed), *Lythrum portula* (Water-purslane), *Persicaria minor* (Small Water-pepper) with an abundance of *Potentilla anserina* (Silverweed). *Limosella aquatica* (Mudwort) was not seen possibly because it appears in late summer.

In the afternoon the rain that had started in the morning turned heavier but this did not deter the party from exploring the little known but surprisingly diverse flora of an upland tetrad to the north of Slaidburn (SD/75E). 100 species were added to the known flora making a total of 164 species for the tetrad, which is a good total for the area.

The second day was spent exploring the upper reaches of the Brennand River valley. The first stop was to explore a marsh where *Equisetum variegatum* (Variegated Horsetail) was found a few years ago (not seen by the party) and where more recently *Equisetum ×font-queri* was discovered (seen by the group) in a mixed population with one of its parents, *E. palustre* (Marsh Horsetail). Surprisingly *Carex arenaria* (Sand Sedge), a new vice county record, was found by the side of a nearby track that crossed the marsh.

Most of the day was devoted to exploring habitats bordering the Brennand River above Brennand House. There are few records from this area and as the walk became physically more demanding, especially above the Brennand Intake it was hoped that relic woodland and base rich flushes would relieve the tedium of an acid, heavily sheep grazed upland landscape. However the habitats continued to reflect the acid substrate. Nevertheless *Myosotis stolonifera* (Pale Forget-me-not) was found, as was *M. secunda* (Creeping Forget-me-not) prompting a discussion as to whether or not some material apparently intermediate between the two species and often sterile was the hybrid between them. Some impoverished oak woodland at over 300m was found but most trees, some very old, were *Quercus × rosacea*. At the highest level one tree proved to be *Q. robur* (Pedunculate Oak) prompting another discussion as to what had happened to *Q. petraea* (Sessile Oak), supposedly the common oak of the uplands. A *Calluna – Eriophorum* bog dominated the moor itself and here members were pleased to see an abundance of *Andromeda polifolia* (Bog-rosemary). Despite a poor forecast there was only one shower – just to make certain the party was soaked on both days.

The meeting achieved most of its objectives but there are many parts of the Brennand and Whiten-dale valleys that remain unexplored.

Thanks are due to United Utilities and tenants for allowing access and to take cars up the Dunsop valley to explore the Brennand River. My thanks too to Phyl Abbott, vice county recorder, for encouragement and record keeping.

ERIC GREENWOOD

KINVER, STAFFORDSHIRE (v.c. 39) 10th-11th July

A total of twenty-five members attended this, the sixth annual meeting organised to supplement recording for a future new Flora of Staffordshire. Six of these botanists are also engaged in the Worcestershire Flora Project and they concentrated their efforts on those areas which, although in v.c. 39, are now in administrative Worcestershire.

On the Saturday, the twenty-one participants divided into seven groups. *Carex acuta* (Slender Tufted-sedge) was a good find by Seckley Wood near the River Severn, south of Arley. In nearby Hawkbatch *Oenanthe fistulosa* (Tubular Water-dropwort) was locally frequent in a boggy hollow, together with a sizeable patch of *Potamogeton polygonifolius* (Bog Pondweed). Seven plants of *Datura stramonium* (Thorn-apple) were on the edge of a Beet field with nearly a hundred in tractor wheel-ruts on the edge of a potato crop, both at Compton. *Leontodon saxatilis* (Lesser Hawkbit) was abundant at Shatterford Wild-life Sanctuary and *Zannichellia palustris* (Horned Pondweed) grew in the canal at Stourton Bridge. *Rosa sherardii* × *R. canina* was not far from Highgate Common where there was a good deal of *Carex pilulifera* (Pill Sedge), including forma *longebracteata* (with distant spikes and bracts exceeding the inflorescence).

On Sunday, there was a slight increase in personnel and adjustments were made in order to form nine groups. *Filago vulgaris* (Common Cudweed) is eighty-sixth equal in the table of taxa showing the greatest relative decrease in *The New Atlas of The British & Irish Flora*. However, in Staffs, there has been an increase, since the 1972 County Flora, from four to seventeen tetrads. One of the latter includes Jesson's Plantation where it occurred on a forestry ride. *Filago minima* (Small Cudweed) has also exhibited a large national decline but has increased, in the vice county, from two to twenty-five tetrads, including four during this weekend. Large quantities were by the transmitter mast in the same plantation and on a roadside near Halfpenny Green. The previous confirmed record for *Bromus commutatus* (Meadow Brome) was from Burton-upon-Trent in 1930, but it was spotted both in a field west of Copley Farm, near Pattingham and also towering above a wheat crop at Four Ashes 12km to the south. *Barbarea intermedia* (Medium-flowered Winter-cress) was on the edge of this crop, with *Sinapis alba* (White Mustard) on a roadside, a few hundred metres away. In S088M there was a single plant of *Cardamine impatiens* (Narrow-leaved Bittercress) between The Hyde and Hyde Bridge and a patch of *Epilobium brunescens* (New Zealand Willowherb) at the side of a forestry ride. *Hirschfeldia incana* (Hoary Mustard) was abundant on waste ground by a track at Whittington, with *Cerastium semidecandrum* (Little Mouse-ear) nearby and at Upper Aston.

Squares on the Worcestershire border yielded *Cirsium eriophorum* (Woolly Thistle), *Scrophularia umbrosa* (Green Figwort) and *Rosa tomentosa* (Harsh Downy-rose) in S078K, North of Arley, with *Rosa canina* × *R. obtusifolia* both there and in S078L. The *Scrophularia* has only ever been seen, and then very rarely, in this extreme south-western corner of the county. *Pilosella officinarum* × *P. aurantiaca* (*P.* × *stolonifera*), a new v.c. record, was on a wall in S078Q, Arley, with *Viscum album* (Mistletoe) at two separate sites, nearby. The Stonewort, *Chara contraria*, was identified from the reservoir east of Brittles, on the edge of Arley Wood where, in the steep West Dingle, grew a stand of mixed age *Tilia platyphyllos* (Large-leaved Lime).

Some uncommon taxa were found several times during the weekend. *Lepidium ruderales* (Narrow-leaved Pepperwort) is a frequent roadside weed in the Black Country and outliers were noted near to Stourton, Whittington and Cookley. *Plantago coronopus* (Buck's-horn Plantain) is mainly seen near to Cannock Chase, but was also at Whittington and Stourton. *Arctium lappa* (Greater Burdock), surprisingly, turned up in S077U, S078Q and S088M, S & T. Several of those present expressed pleasure at finding good quantities of *Chrysanthemum segetum* (Corn Marigold) in S088S, T and V and in S089E. Some members, driving home along the A458, north-east of the meeting point, stopped near to the junction with the A449 to investigate three *Oenothera* plants. They proved to be *O. glazioviana* (Large-flowered Evening-primrose), *O. stricta* (Small-flowered Evening-primrose) and *O. biennis* × *O. cambrica*, the last being new for the v.c. In all, 4254 tetrad records were made of which 2545 were additions to the 1995-2008 Flora Project.

REPORTS OF OVERSEAS FIELD MEETINGS – 2004

PICOS DE EUROPA, NORTHERN SPAIN, 31st May – 9th June

Fourteen members flew to Bilbao to join the two leaders, Lynne Farrell and Teresa Farino. Teresa has lived in the Picos de Europa since 1986, and is a relative expert in comparison to Lynne, who had only visited the Picos once before, but had been charmed by its scenery and natural history. Once the group had congregated, following a sumptuous lunch for some in a cider-house in Lofu, we set off in two large-minibuses, which Teresa was used to driving but presented a steep learning curve for Lynne. After about 3 hours we reached the first of our two family-run hotels, this one in the delightful village of Espinama, where – despite the late hour – we managed to do justice to the magnificent local cuisine.

1 June: Our first excursion was on foot directly from the hotel along a footpath bordered by rich verges. Progress was fairly slow owing to the many new and familiar plants found, including *Silene nutans* (Nottingham Catchfly), *Valeriana pyrenaica* (Pyrenean Valerian), *Draba muralis* (Wall Whitlowgrass) and *Geranium purpureum* (Little Robin). Climbing gently onwards towards Fuente Dé, we came to richer and highly colourful meadows with abundant *Rhinanthus*, mainly *R. serotinus* subsp. *asturicus* (Greater Yellow-rattle), the pink form of *Anthyllis vulneraria* (Kidney Vetch), *Geranium sanguineum* (Bloody Crane's-bill) and *Echium vulgare* (Viper's Bugloss) the banks covered with the Picos endemic greenweed *Genista legionensis*.

The scenery up to the nearby peaks – some more than 2,000 metres – was wonderful and so was the show of *Ophrys tenthredinifera* (Sawfly Orchid), growing with *O. sphegodes* (Early Spider-orchid), *O. fusca* (Dull Orchid), and *Aceras anthropophorum* (Man Orchid). In the nearby woodland were tall stems of *Lilium martagon* (Martagon Lily) still in bud.

After lunch we explored a wet meadow, treading carefully so as not to damage the hay crop. More orchids were found such as the yellow form of *Dactylorhiza sambucina* (Elder-flowered Orchid), *Orchis mascula* (Early-purple Orchid), and *Orchis ustulata* (Burnt Orchid), *Serapias lingua* (Tongue Orchid) together with *Trollius europaeus* (Globeflower), *Asphodelus albus* (White Asphodel), *Potentilla rupestris* (Rock Cinquefoil) and *Dianthus deltooides* (Maiden Pink). In the flushes were *Parnassia palustris* (Grass-of-Parnassus), *Pedicularis verticillata* (Whorled Lousewort), *Anagallis tenella* (Bog Pimpernel), *Eriophorum latifolium* (Broad-leaved Cottongrass), *Cardamine raphanifolia* (Greater Cuckooflower) and *Hypericum undulatum* (Wavy St John's-wort).

Along a shady path we found *Dactylorhiza markusii* (Sicilian Orchid) and *D. insularis* (Barton's Orchid), which are very similar in appearance at first acquaintance. *Neotinea nidus-avis* (Bird's-nest Orchid) and *Paris quadrifolia* (Herb-Paris) were seen in the beech-wood while we listened in vain for Black Woodpeckers. The downwards track led us through slopes of the blooming yellow bushes of the *Genista hispanica* subsp. *occidentalis* (Spanish Gorse), where we chased a myriad butterflies and tried to photograph the singing Field Crickets.

2 June: After a quick examination of the moth trap, whose tenants included a fabulous 'rusty' tiger moth called *Hyphoraia dejeani* and the Small Ranunculus, extinct in Britain since 1939, the second day saw us heading down the Deva valley. A quick stop in the market town of Potes turned up *Campanula erinus* (Annual Bellflower) and *Phagnalon rupestre* on a wall, from which we headed north through the 2km deep La Hermida Gorge, where no direct sunlight falls for 5 months of the year.

Walking up the side gorge of the River Urdón, we gazed at the near-vertical rock-gardens where *Erigeron karvinskianus* (Mexican Fleabane) and *Antirrhinum braun-blanquetii* (Iberian Snapdragon) were growing with the Picos endemics *Linaria faucicola* and *Petrocoptis pyrenaica* subsp. *glaucifolia* (Blue-leaved Petrocoptis). Several yellow crucifers – *Erysimum duriaei*, *Biscutella valentina* subsp. *valentina* var. *laevigata* (Buckler Mustard) and *Coincya monensis* subsp. *cheiranthos* (Wallflower Cabbage) – grew with the lilac-flowered *Globularia nudicaulis* (Leafless-stemmed Globularia) and the pink *Linum viscosum* (Sticky Flax). Shrubs included *Prunus mahaleb* (St Lucie's Cherry), *Jasminum fruticans* (Wild Jasmine) and *Cistus salvifolius* (Sage-leaved Cistus). *Adiantum capillus-veneris* (Maidenhair Fern) grew in drifts on the rocks but the most impressive fern by far was the rare *Wood-*

wardia radicans, its 2m. fronds ‘pouring’ down a shady cliff opposite. We lunched and spent the afternoon on sunny, shaly slopes near Tudes, south of Potes. There was a strong Mediterranean element with *Lavandula stoechas* (French Lavender), *Thymus mastichina* (Round-headed Thyme) and *Bituminaria bituminosa* (Pitch Trefoil), plus *Bupleurum baldense* (Small Hare’s-ear), *Eryngium campestre* (Field Eryngo), *Ononis reclinata* (Small Restharrow), *Petrorhagia prolifera* (Proliferous Pink), and *Tuberaria guttata* (Spotted Rock-rose), the latter 5 being rare in Britain, but the last being newly-discovered on the island of Coll! In the village of Tudes we found *Juglans regia* (Walnut) groves and a splendid old *Quercus ilex* subsp. *ballota* (Western Holm Oak) and dipped into the water trough to find and photograph Marbled and Palmate Newts, whilst trying not to go in head-first!

3 June: After a chilly night there were few moths in the trap, the most spectacular being a Fox Moth. However, the weather soon brightened and we had fine views of the peaks and the Isard (Pyrenean Chamois) as we emerged from the upper cable car station above Fuente Dé. The ground was littered with *Ranunculus amplexicaule* (Amplexicaule Buttercup), the local endemic *Anemone pavoniana*, sheets of tiny daffodils *Narcissus asturiensis* and blue splashes of *Gentiana verna* (Spring Gentian) and *G. angustifolia* (Pyrenean Trumpet Gentian). Alpine Choughs wheeled overhead and we had good views of Alpine Accentor and Snow Finch. On our way across to a clear alpine pool, home to Alpine Newts and Midwife Toads, we saw the beautiful lemon-yellow of *Saxifraga felineri*, the generic name referring not only to the plant breaking stone but also medicinally having been used for the dissolving of ‘stones’. Mary Clare Sheahan described the enormous, mating Common Toads in the second pool as ‘turning out spawn like ticker-tape!’

As the season was late, there were not sheets of flowers but the occasional, colourful splash of *Gagea lutea* (Yellow Star-of-Bethlehem), *Pulsatilla vernalis* (Spring Pasqueflower) and *Saxifraga oppositifolia* (Purple Saxifrage). After lunch we explored the scree-fans in the adjacent pasture, which turned up *Aquilegia vulgaris* (Columbine), *Linaria alpina* subsp. *filicaulis* (a Picos endemic subspecies of Alpine Toadflax), *Reseda glauca* (Pyrenean Mignonette), *Vicia pyrenaica* (Pyrenean Vetch) and *Botrychium lunaria* (Moonwort), and all topped off with a wonderful blue haze of *Echium vulgare*. Back at the hotel we celebrated with a birthday cake for Mark Howarth.

4 June: Our first stop was a roadside meadow near Frama, where west-facing, shaly cliffs revealed *Dorycnium pentaphyllum*, *Thymus mastichina*, and *Cistus salvifolius*. Unfortunately the meadow itself had just been cut, so that a litter of tall *Himantoglossum hircinum* (Lizard Orchid) was strewn across the ground. An unusual, bright scarlet fungus – *Clatters archeri* – was also a victim. Arthur Copping had meanwhile been combing the verge for grasses and found a new species for the Picos: *Poa angustifolia* (Narrow-leaved Meadow-grass). Further on we were shown the local endemic *Echium cantabricum*, which is restricted to the area around the Piedrasluengas pass – our main destination for the day – where we explored a Carboniferous limestone gorge, extensive wet meadows by the river, isolated rock outcrops, sloping, sub-alpine grasslands and beech-wood hangers.

Ranunculus aconitifolius (Aconite-leaved Buttercup), *Narcissus pseudonarcissus* subsp. *nobilis* (Wild Daffodil), *Geum rivale* (Water Avens) and *Geranium sylvaticum* (Wood Crane’s-bill) were scattered in the wetter places, while *Ranunculus gouanii* (Gouan’s Buttercup), *Meum athamanticum* (Spignel), *Potentilla montana* and the Iberian endemic *Viola bubanii* (Violet Mountain Pansy) were in flower on the upper drier grasslands. In the woodland, *Polygonatum verticillatum* (Whorled Solomon’s-seal), *Lilium martagon* and *Actaea spicata* (Baneberry) were located after a search. On the sun-baked rocks *Thlaspi perfoliatum* (Perfoliate Penny-cress), *Arabis scabra* (Bristol Rock-cress), *Trinia glauca* (Honewort) and *Allium sphaerocephalon* (Round-headed Leek) made us feel that we might be in the Avon Gorge!

5 June: We transferred from Espinama to Posada de Valdeón further west via a circuitous, but scenically and botanically interesting route, travelling up the Valle de Cereceda where we saw a tall ‘heath’ composed of *Halimium lasianthum* subsp. *alyssoides*, *Pterospartum tridentatum* and *Erica australis* (Spanish Heath) and *E. umbellata*, before visiting the splendid wet meadows near San Gloria which hosted *Nigritella nigra* (Vanilla Orchid), *Viola cornuta* (Horned Pansy), and *Pedicularis mixta*. The surrounding scrub was composed primarily of *Genista obtusifolia*, while sunny banks turned up *Phalacrocarpum oppositifolium*, both Iberian endemics.

Lunch was at the water-meadows of the Arroyo de Mostajal, where *Tozzia alpina* (Tozzia) and *Tulipa sylvestris* subsp. *australis* (Wild Tulip) were highlights. The large tussocks of *Festuca paniculata* subsp. *spadicea* impressed Arthur, while a dry knoll had *Arnoseris minima* (Lamb's Succory), which most failed to recognise as it is now extinct in Britain! Here too were *Ranunculus nigrescens*, *Linaria elegans* and the seed capsules of *Narcissus triandrus*, also new species for the trip.

The drivers dropped off their passengers at the charming, traditional hill village of Santa Marina de Valdeón for a short walk down to our second hotel in Posada de Valdeón, between the floriferous banks of the single-track winding road. The banks had *Campanula rapunculus* (Rampion Bellflower), *Linum narbonense* (Beautiful Flax), *Herniaria hirsuta* (Hairy Rupturewort), and several *Orobanche* spp. (Broomrapes). Luckily, the drivers just missed the after-work rush up the valley in the opposite direction!

6 June: We explored the Arroyo de Cable valley, south west of Posada, on the northern slopes of the Cordillera Cantabrica, cadding a lift in a 4WD-taxi on the way up. The valley extended from beech forest up to idyllic, summer-grazed pastures, surrounded by a backdrop of impressive crags with lingering snow patches. The underlying geology is Devonian shales mixed with conglomerates and is acid, hosting *Pulsatilla alpina* subsp. *cantabrica* and *Orchis pallens*, (Pale-flowered Orchid) in the drier meadows, *Veratrum album* (White False Helleborine) and *Swertia perennis* (Marsh Felwort) in the wet flushes, and *Cryptogramma crispa* (Parsley Fern) and *Saxifraga spathularis* (St Patrick's Cabbage) on the rocks.

As we climbed further up through a blue haze of *Scilla verna* (Spring Squill), dry heath replaced the grassland and we found *Luzula nutans*, *Erica arborea* (Tree Heath), *Rosa pendulina* (Alpine Rose), *Geranium cinereum* subsp. *subargenteum* (Ashy Crane's-bill), *Pinguicula grandiflora* (Large-flowered Butterwort) and *Homogyne alpina* (Alpine Colt's-foot), plus the endemic, white-flowered crucifer *Teesdaliopsis conferta* on loose shale.

At the head of the valley at 1600m was a basin mire with *Sphagnum* species and clear pools. Nearby were *Fritillaria pyrenaica* (Pyrenean Snakeshead), *Narcissus bulbocodium* (Hoop-petticoat Daffodil) and *Erythronium dens-canis* (Dog's-tooth-violet), which were much worshipped by the keen photographers. There were, for us British botanists, some unusual combinations of plants: *Calluna vulgaris* (Heather), growing with *Helleborus viridis* (Green Hellebore) and *Daphne laureola* (Spurge Laurel). A memorable sight of about 40 Isard, conspicuous on the snowy crags, caught our attention on our way back down to a late lunch under the shade of a large *Sorbus aria* (Common Whitebeam).

The lower, stony slopes were completely lit up with the warm yellow of the sweet-scented, blossoming *Genista hispanica* subsp. *occidentalis*. Just before boarding the buses, we located a new colony of the scarce Chequered Skipper butterfly, a fresh specimen of the *Tau* Emperor moth, and a spectacular, pale yellow flowered spike of *Pedicularis foliosa* (Leafy Lousewort).

7 June: After finding a magnificent female Emperor Moth on the bulb of the moth trap, we strolled along the local pathways from our hotel up to the wonderful meadows en route to the next village of Cordiñanes. A Red-backed Shrike and a Camberwell Beauty were spotted, while Bonelli's Warbler and Iberian Chiffchaff heard singing. Butterflies abounded in the meadows with yet another Chequered Skipper, Black-veined White, Mazarine, Turquoise and Short-tailed Blues and Scarce Swallowtail among the most notable. Various *Serapias* spp. were admired, including *S. vomeracea*, located by Phyl Abbot, while *Coeloglossum viride* (Frog Orchid) was found in scattered patches, plus *Phyteuma orbiculare* (Round-headed Rampion) and the leaves of *Iris latifolia* (English Iris).

After lunch outside the local pub, where we kept retreating into the limited area of shade because of the rising temperatures we crossed over the River Cares to the Mirador, where we saw the start of the gorge in the distance. *Centaurea calcitrapa* (Red Star-thistle) was seen on the bare areas, and *Teucrium pyrenaicum* (Pyrenean Germander) was seen in flower for the first time. The startling, large whitish-pink flowers of *Linum suffruticosum* subsp. *salsoloides* (Pyrenean Flax) caught everyone's eye, along with *Polygonatum odoratum* (Angular Solomon's Seal). Rock outcrops were festooned with stonecrops including *Sedum brevifolium* (Short-leaved Stonecrop) and the Iberian endemic *S. arenarium*, also hosting *Hypericum linariifolium* (Toadflax-leaved St John's-wort). We just had time to see

Crepis albida subsp. *asturica* (Pyrenean Hawk's-beard) before the looming dark clouds brought us the first rain of the trip, as we hurried the last few metres back to the hotel.

8 June: The sun rose and touched the crags surrounding the valley on our last full day in the Picos, but it was the Transit of Venus which really caught our imagination. We set up the telescope in the hotel car-park and were delighted as we saw the image projected onto a sheet of white paper. Mark Howarth was the principal astronomer, ably assisted by Jean Kendrew explaining the physics. We photographed the event and the image first at 0915 and then several more times along our journey until the last view was obtained at 1315. The Guardian reported that in 1882 Robert Ball wrote 'The next people will see it (the transit) is when the flowers are in bloom in June 2004'. This was certainly true for us as a group: the flowers were also superb.

En route southwards to 'The Plains of Castile', we stopped briefly in the beech cloud-forest, where lichens 'dripped' off the moisture-laden trees. Here grew *Scilla lilio-hyacinthus* (Pyrenean Squill) with *Euphorbia hyberna* subsp. *hyberna* (Irish Spurge), *Cardamine raphanifolia*, *Polygonatum verticillatum*, *Paris quadrifolia*, and *Pyrola minor* (Common Wintergreen). Further on, into the flat lands, we saw storks nesting on the bell towers of nearly every village church.

We reached the open limestone areas near Cistierna where there were many pretties, including *Aphyllanthes monspeliensis* (Blue Aphyllanthes), *Bellardia trixago* (Bellardia), *Catananche caerulea* (Blue Cupidone), *Anagallis monelli* (Shrubby Pimpernel), three species of flax – the blue *Linum narbonense*, the pinkish-white *L. suffruticosum* subsp. *apressum* (White Flax), and the yellow *L. strictum* (Upright Flax) – and masses of *Himantoglossum hircinum* at last. Nightingales and Melodious Warblers serenaded us and Purple-shot Coppers and Swallowtails floated by. In an arable area across the road we found more British rarities in one field than most people had seen in Britain as a whole, with colour provided by *Vicia pannonica* (Hungarian Vetch), *Althaea hirsuta* (Rough Marsh-mallow) and *Anchusa azurea* (Large Blue Alkanet).

Another roadside stop near Mondreganes yielded a cereal field teeming with *Papaver rhoeas* (Common Poppy), *Centaurea cyanus* (Cornflower), *Agrostemma githago* (Corncockle) and *Matricaria recutita* (Scented Mayweed). Lunch by the river gave us chance to observe the Beautiful Demoiselle damselfly, Iberian Pool Frog, Viperine Snake, Palmate Newt, a red-and-black striped oil beetle (*Berberomeloe majalis*) and a praying mantis (*Empusa pennata*) nymph. Nearby we found *Orchis coriophora* (Bug Orchid) and *Dactylorhiza elata* (Robust Marsh Orchid), in the verges of cereal fields where a Montague's Harrier quartered the ground. A plant new to Teresa, *Myosurus minimus* (Mousetail), although rather dried-up, was found by Mark Kitchen in a ditch here.

On the return route we explored an area of gravel workings which now had many small ponds providing homes for frogs, toads and dragonflies, as well as suitable habitats for many butterflies and moths. The final stop of the day was at the viewpoint, or Mirador de Valdeón, to admire the 'puce-coloured' flowers of the Iberian endemic toadflax *Linaria triornithophora* and, of course, the view down to the distant village that had been our welcome home for the last five days.

June 9: An early start, a drive through the spectacular Desfiladero de los Beyos, and breakfast at the 'Blue café' on our way back to Bilbao airport, signified the end of a very pleasant and rewarding BSBI field meeting in the Picos de Europa. We recorded almost 800 species of plant and added several new ones to Teresa's list, for example, the small, yellow-flowered member of the Scrophulariaceae which puzzled everyone in the meadow at Fuente Dé. It was collected by Graeme Kay and sent off to Eric Clement, who pronounced it to be *Triphysaria pusilla* (*Orthocarpus pusillus*), a western North American species. It is apparently the first record of this plant being established in the wild in Europe.

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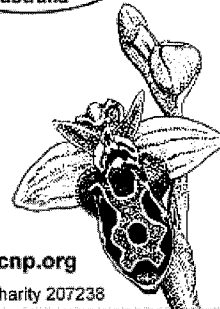


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DIARY

N.B. These dates are supplementary to those in the 2004 Calendar in BSBI Year Book 2004 and include dates of the BSBI's Permanent Working Committees.

2004

Permanent Working Committees

15 Sept	Meetings Committee, London	20 Oct	Executive Committee, London
1-10 Oct	Database Subcommittee E[mail]-meeting	21 Oct	Publications Committee, London
13 Oct	Records Committee, London	17 Nov	Council Meeting, London

2 Oct Counting Bristol Whitebeams day, Avon Gorge, Bristol (see p. 53)

6 Nov Scottish AGM, Royal Botanic Garden, Edinburgh

2005

26 April – 6 May Excursion to the Czech Republic (see p. 54)

18 – 25 June Excursion to the Catalan Pyrenees (see p. 54)

EDITORS

APOLOGY

The General Editor Gwynn Ellis would like to apologise to anyone whose email or telephone message sent in July has remained unanswered. A catastrophic computer crash, which needed a new computer, wiped out many emails; and coincidentally, a malfunctioning answer phone resulted in many messages being garbled or completely unintelligible. All is hopefully working now, so please try again.

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