

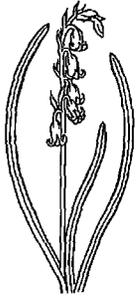
BSBI NEWS

April 1999

Edited by R. Gwynn Ellis

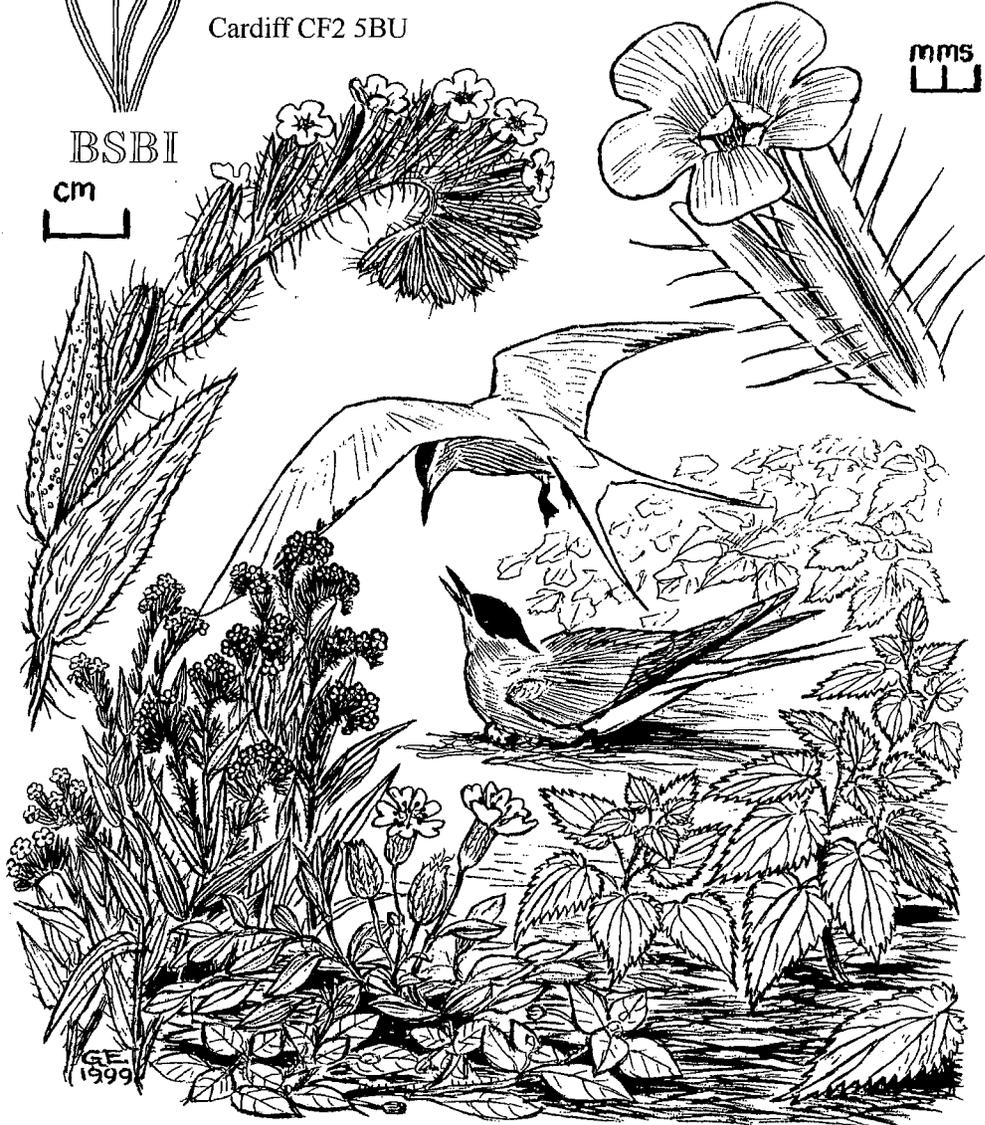
No. 81

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BSBI

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BSBI ATLAS 2000 (N. IRELAND)

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CONTRIBUTIONS INTENDED FOR

BSBI NEWS 82

should reach the Editor before

AUGUST 1 1999

IMPORTANT NOTICES

PRESIDENTS' AWARD

The Presidents of the Wild Flower Society, David McClintock, and of the BSBI have decided that this prize for 1998, annually awarded jointly by the Presidents of the two societies, should go to Geoffrey Kitchener and Douglas McKean. Their finding of *Epilobium* hybrids involving both British and New Zealand species well fits the object of this award which is: 'for work adding to knowledge of the British flora'. Their work was published in *Watsonia* 22: 49-60 (1998), 'Hybrids of *Epilobium brunnescens* (Cockayne) Raven & Engelhom (Onagraceae) and their occurrence in the British Isles.'

Our task was unenviable, as David remarked. A number of candidates were discussed, and we would especially highly commend the *Plant Crib 1998*, ed. T.C.G. Rich & A.C. Jermy, immensely useful for current field recording, but, as Tim pointed out, the information in it was provided by a whole team of BSBI members and as such it would in any case not qualify for this award.

Our 1998 recipients well deserve the recognition, and this year we will be proud to present it at the BSBI AGM on May 8th, at the Royal Pharmaceutical Society in London.

MARY BRIGGS & DAVID McCLINTOCK

BSBI AGM May 8th 1999

Information additional to Programme (sent with January mailing)

Lunch. The cold buffet available on the premises from 1.00 p.m., will include a choice of some (or all) of 7 courses, a glass of wine or fruit juice, and coffee.

The booking form is on the programme sent in January.

Alternatively, there are seats on the embankment or in a nearby small park for those who bring their own sandwiches. Also a pub (which might not be very speedy) just around the corner.

Museum. From 1.40 - 2.45 (not 1.15 as in printed programme) the Pharmaceutical Museum Curator and her assistants will be on duty to explain the displays on each floor of the building. There will also be a dispensing demonstration including pill-rolling for any member who would like to try their hand!

Unfortunately, the Museum of Garden History opposite is closed on Saturdays. Their Director would have been willing to open for us privately on May 8th, but on that day they have a coach excursion, so no staff are available. We will hope to arrange a visit on another occasion.

Good views from the terrace on the 5th floor of the River Thames, Palaces of Westminster and Lambeth, Big Ben, etc., if weather is clear (bring cameras if interested).

BSBI Books – Margaret Perring will be bringing a selection of recent publications.

Don't forget there will be a meeting at the Natural History Museum on Sunday May 9th, for details and booking form see leaflet sent with your January mailing.

Map. A reminder map is printed on page 82 with, this time, bus numbers included.

Looking forward to meeting you on May 8th.

MARY BRIGGS, President.

AMENDMENTS & CORRECTIONS TO BSBI YEAR BOOK 1999

Page 2 – *Change of emphasis*

Corrections or alterations to the List of Members and **subscriptions** should be sent to:
Mr M. Walpole . . .

Queries of a financial nature, **apart from subscriptions** should be sent to:
Mr M.E. Braithwaite . . .

Page 3 – *Insert before BSBI Web site address*: (see also page 4)

BSBI ATLAS 2000 (N. IRELAND)

Fiona McKee

Botany Dept., Ulster Museum, Botanic Gardens, Belfast, BT9 5AB

Page 7 – *Correction* – The Scottish AGM will be held at Stirling on November 6th [**not 1st**]

Page 9 – *NB*. The Permanent Working Committees will be re-appointed by Council following the AGM on May 8th. The new Committees, with updated membership, and with some new Committee titles and revised status's (if approved at the AGM) will be published in *BSBI News* **82** in September 1999.

Page 12 – *Revised price* – *Watsonian* v.c. maps from BSBI Publications are now £5.00 (incl. p.& p.)

Page 28 – *Change of address* – M.J. Southam has moved, for new address see page 10.

Page 38 – *Replacement entry* – Useful addresses; **British Pteridological Society**

Hon. General Secretary: Miss Jennifer M. Ide, 42 Crown Woods Way, Eltham, London, SE9 2NN (Tel. & Fax: 0181 850 3218)

Page 40 – *Replacement of last 2 paragraphs* – BSBI Research Fund – see below.

MARY BRIGGS, Editor *BSBI Year Book 1999*

BSBI RESEARCH & TRAVEL GRANTS

Unfortunately, due to an error on my part, out-of-date information on the BSBI's Research and Travel Grants was published on page 40 of *BSBI Year Book 1999*.

Applicants should note that the latest information re Grant Applications to the BSBI Research Fund is to be found in *BSBI News* **79**: 3, and that applications *should be sent to Mr Clive Jermy* at the address below and *NOT* to the Hon. General Secretary.

Normally, the Science and Research Committee reviews applications *only twice a year*, the deadlines for receiving applications being 14 January and 31 July. The results of applications for grants up to £1000 will be known within eight weeks; those for larger amounts must be ratified by Council and applicants should know by the end of March and the end of November respectively.

The Warburg and Welch grants are considered on equal footing with other applications but the Committee is nevertheless keen to support young botanists who submit applications of the right merit.

Mr A.C. Jermy, Honorary Research Associate, Botany Department, The Natural History Museum, Cromwell Road, London SW7 5BD. Tel: 0171 938 9428; Fax: 0171 938 9260; E-mail: C.Jermy@nhm.ac.uk

GWYNN ELLIS, Hon. General Secretary

ATLAS 2000 IN NORTHERN IRELAND

Sincere apologies to Fiona McKee for omitting her name from the Administration page of both *BSBI News* and *BSBI Year Book*. Fiona has worked for the BSBI for the last 2 years, managing a 'Vascular plant database' for Northern Ireland for the Atlas 2000 project. She reports that this 'now holds over half a million records and there are very few hectads in Northern Ireland that have less than 300 species recorded for them . . . '.

We thank Fiona and Paul Hackney at the Ulster Museum for the excellent work they are doing, on our behalf, in Northern Ireland. The database will of course be an important resource for the future and not just for Atlas 2000.

EDITOR

WATSONIA 22(3) CORRIGENDA

The following errors have been detected in *Watsonia* 22(3):

- p. 253 insert as last line of page:
occur. Despite these problems, changes in the records over time indicate the general trends.
- p. 281 insert as last line of couplet 3b:
5 mm; nodes and leaf bases green; inflorescence racemose **punctata**

MARTIN SANFORD, Receiving Editor *Watsonia*, Suffolk Biological Records Centre, Ipswich Museum, High Street, Ipswich, Suffolk, IP1 3QH. Tel: 01473 213761; Fax: 01473 281274; E-mail SBRC@globalnet.co.uk

DIARY

N.B. These dates are supplementary to those in the 1999 Calendar in *BSBI Year Book* 1999.

1999

August

- 8th John Dony/Victor Chambers Memorial Meeting, Beds., v.c. 30 (see page 58)
20th - 23rd Welsh Annual General Meeting, Trinity College, Carmarthen, v.c. 44 (see page 57)

October

- 13th - 16th 5th International Conference on the Ecology of Invasive Alien Plants, La Maddalena, Sardinia, Italy (see page 82)

November

- 6th Scottish AGM, Stirling (v.c. 86) [39]. *Not* November 1st as published in *BSBI Year Book* 1999.
23rd - Dec. 8th *Daisy Forests and Giant Tortoises: Plants and Natural History of the Galapagos Islands* led by Lynne Farrell (see page 6).

See also page 82 for dates of other holidays overseas

EDITOR

EDITORIAL & NOTES

Congratulations to: Lady Anne Brewis, MBE in the New Years Honours for 'services to Nature Conservation in Hampshire'. Anne has been BSBI Recorder for N. Hants (v.c. 12) for 25 years, and was co-author of *Flora of Hampshire* in 1996. (MB)

To Roy Lancaster, MBE, well-known to many through broadcasts on television, and currently back on 'Gardeners Question Time'. In past years Roy brought large displays of native evergreen shrubs to our Exhibition meetings. (MB)

To Dr Francis Rose, to whom Plantlife last year awarded their highest accolade – 'for his outstanding contribution to conservation'. He was presented with an original print of *Anagallis tenella* from Sowerby's *English Botany*. (MB)

Also to Hugh Syngé for, with *Plant Talk*, achieving selection as a runner-up for the prestigious Whitley Award for International Nature Conservation. Nine of the candidates were short-listed, of which Hugh's was one of only two botanical projects. Hard to compete against South African Cranes, the world's rarest snake in Antigua, and snow leopards in northern Pakistan . . . Hugh did well to be one of the nine, but said 'what we need is a *really good* botanical project.' (MB)

And to Ro Scott, who reached the finals of the Radio Quiz 'Wildbrain of Britain'. Ro was the best runner-up from the semi-finals, and her knowledge of Scottish botany was evident. Lynne Farrell tells me that Ro's prize was the *Life of Birds* by David Attenborough. Ro says that she enjoyed her visits to RSPB, Sandy, and to BBC Bristol for the heats, and meeting the other contestants. (MB)

And to Dr Catharine Hollman, a family member of the BSBI, who was formerly a community paediatrician and since her retirement nine years ago has trained as a botanical illustrator. In 1998 for the first time she exhibited her work at a Royal Horticultural Society Flower Show in London. The theme of her exhibit was '*Plants of the Shingle Beach*'. Using pen and wash she painted 12 plants that grow in the demanding conditions of the exposed shingle beach at Rye Harbour Nature Reserve in East Sussex. The Society awarded her a Gold Medal and on the citation stated that 'Gold Medals are awarded only to exhibits of outstanding excellence'. (GE)

Lucky Lynne Farrell is leading a course for the Field Studies Council Overseas to the Galapagos Islands for 10 days from 23 November to 8 December 1999. Anyone interested in joining the course *Daisy Forests and Giant Tortoises: Plants and Natural History of the Galapagos Islands* should contact the FSC Overseas at Montford Bridge, Shrewsbury, SY4 1HW; Tel.: 01743-850522; Fax: 01743-850599; E-mail: fscOverseas@bluecom.net (GE)

Recording

Reported in The Millennium Seed Bank project's newsletter as a 'Highlight' seed collection for 1998 – 'Oysterplant (*Mertensia maritima*) via Elaine Bullard in Orkney.' (MB)

And finally, Among the inserts with this mailing are: *BSBI News*, *BSBI Annual Report 1998*, our new *Code of Conduct* leaflet, *The Young Botanist*, the final Atlas 2000 fieldwork booklet – *Strategy for the Final Year*, a questionnaire seeking information from members for a *Directory of Vascular Plant Systematists*, hopefully, an offer for Clive Stace's new *Field Flora*, and possibly one other advertising leaflet (*News* goes to press before all inserts have been finalised). (GE)

GWYNN ELLIS, Editor (GE) & MARY BRIGGS, President (MB)

ATLAS 2000

PROGRESS REPORT

Strategy for the Final Year Booklet

Stunning progress has been made on many fronts since the last Atlas 2000 Report and David Pearman, Chris Preston and I would like to thank all of those that have worked so hard over the last few months in getting their data in to us. The pace of the project has really increased with the production of Discrepancy and Verification lists, which have stimulated many Recorders to submit their data earlier than anticipated.

We have currently received data for over two thirds of the squares in Britain, and 1.5 million Atlas 2000 records have been added to the database at Monks Wood (in a special Atlas 2000 table called, rather fetchingly, the 'Trevor Table'). A steady flow of records has begun from the Republic of Ireland, and the first data has also come from CEDaR in Northern Ireland.

It's already clear that vast improvements in coverage have been made since the last Atlas (see maps of *Epilobium ciliatum* on page 8 of *BSBI News* 80) and throughout the project, emphasis has been placed on improving coverage in under-recorded areas, mainly through the programme of Atlas 2000 field meetings. For this final year, however, a more targeted and detailed approach is needed. All Vice-county Recorders have been approached to determine where the potential gaps in coverage are. The results are outlined in a booklet, *Atlas 2000 - Strategy for the Final Year*, which accompanies this issue of *BSBI News*.

PLEASE READ THIS BOOKLET AND HELP US WITH RECORDING IF YOU CAN

The booklet also contains the usual progress report, map of data received, and also an interesting selection of preliminary species maps from the data submitted.

Other News

A few other points are worth making here. Firstly, we are very pleased to announce that Fiona McKee, who has been employed by the BSBI for the last two years as data-inputter at CEDaR in Northern Ireland (see 'The Vascular Plant Database for Northern Ireland and NI Atlas 2000 Project', *BSBI News* 80: 10-12) will be with us until next March following further funding from the Environment and Heritage Service (Northern Ireland). Fiona is computerising almost all the data from Northern Ireland, and it's wonderful that she will be able to finish her work at CEDaR.

Secondly, we are also very grateful to the Wild Flower Society who have again made a generous grant to assist us in recording our montane species. This is the third such grant, and they have allowed us to cover remote areas of Scotland that could otherwise have been very poorly recorded. The Atlas 2000 will benefit greatly from their help.

Finally, members may remember the use of a helicopter to gain access to a remote Irish hilltop (by Caroline Mhic Daeid in S. Kerry) during the Monitoring Scheme. Not to be outdone, we can now report the use of a helicopter by Larch Garrard to gain access to a small island off Isle of Man for Atlas 2000 recording. There are quite a few Scottish islands that would benefit from similar treatment – any offers?

Acknowledgements

The *Atlas 2000* project is funded by the Department of the Environment, Transport and the Regions (in Great Britain) with additional support from the Environment and Heritage Service (Northern Ireland) and the National Parks and Wildlife Service (Republic of Ireland). Additional support has come from numerous other sources, particularly Scottish National Heritage and the Wild Flower Society. We are grateful to all these bodies for their support.

TREVOR DINES (Atlas 2000 Organiser) Rhyd y Fwch, Bethel, Nr Caernarfon, Gwynedd LL55 3PS.

Tel: 01248 670789; e-mail: TrevorDines@compuserve.com

CO-ORDINATORS' CORNER

Species Identification

We are now just starting the third year of the BSBI – University of Birmingham – Field Studies Council Post-Experience Certificate in Biological Recording and Species Identification. Members will be aware that this arose from a suggestion by Franklyn Perring that there should be more in the way of properly accredited university level botanical identification courses available. We aim to recruit experienced botanists, both professional and amateur, and newly-qualified graduates who require more field identification and practical ecological skills to supplement their degrees.

A large proportion of both students and tutors on the certificate are BSBI members, although the Certificate now extends beyond pure botany to encompass zoology, ecology and computer technology. This year we have even added a few modules in marine biology – surely a first for the University of Birmingham. In total there are 50 courses on offer this year, mostly two or three days long and taking place either on a weekend or during the working week. All are residential and are based at FSC Field Centres around England & Wales. Costs range from £106 to £300.

Why the plug, you may ask, from the co-ordinators' privileged position? Well, the Certificate was the idea of the BSBI in the first place, and the benefits so obviously flow both ways that it is quite appropriate to promote it. The tutors are frequently botanical experts from among the BSBI's ranks, and we are always looking out for specialists to teach their particular subject. The wages are not great – one tutor last year chose a case of Burgundy rather than a salary – but the opportunity to lead a group of enthusiastic and hardworking students for a few days is one not to be missed. Among our most popular courses are the computer modules, and there is nowhere else you can be taught the subtleties of biological recording, or using the Internet for computer-mapping, or where the BSBI can train the next generation of vice-county recorders.

Threatened Plants Database

Since January this year the BSBI has been running a new project on behalf of the Joint Nature Conservation Committee, English Nature, Scottish Natural Heritage, the Countryside Council for Wales, Plantlife and the Biological Records Centre, officially called the BSBI/NBN Threatened Plants Database Project – or TPDB for short. It will run for three years and is being led by us, the co-ordinators, hopefully with support from two regional organisers. The central aim of the project is to take forward the national database on rare plants, but in its operation it is much more than that.

For a number of years now people have been talking about the NBN and the famous 'Windows-based' version of Recorder. In fact the wait has been so long that it would be easy to think that it would never happen. But it is happening, and the changes it will bring about may be more sudden and more drastic than one might expect.

The important point to bear in mind is that the NBN data standards will represent a complete revolution in biological recording. The task in the past has always been to find an efficient way of compiling and presenting biological records. The dot maps in traditional county Floras and national Atlases are an example of this – a simple and easy way of representing distribution. Even just a few years ago, computer programs were advertising themselves as being 'very efficient in the storage of information' because the size of hard disks on PCs was so limiting. That is no longer the case, and newer computers can effectively be viewed as having an infinite storage capacity and instantaneous retrieval. It is like an automated library of unlimited size.

So what difference does this make? The thing you must do is step back for a moment and think of the opportunities this presents. Imagine if every historian, field botanist, ecologist, taxonomist, museum curator and wild flower photographer used this incredible system to store their information. It can store quadrat data, photographs, biographies and itineraries, scanned images of herbarium sheets, chromosome counts, maps, population sizes – everything that a researcher might want to do with botanical information. Imagine if everyone used this, and exchanged their information through a

network of botanical recorders. There would be hardly any need for tetrad recording – except for the very occasional statistically-based county Flora. Tetrad 'bashing' was invented for the purpose of summarising distributions. But it is only a summary. In future the computer will produce this summary from a whole variety of surveys and field work conducted for other purposes, presenting us with an opportunity to do lots of more varied and interesting types of field work, while still being able to produce atlases and floras at the end.

The Threatened Plants Database is designed to make use of the technology inherent in the new systems. We want to know as much more about the ecology and botany of each species. For a start, a lot of these so-called 'rare' plants are less than universally recognised, anyway – taxonomic studies are an integral part of the process of studying these species.

In general, we will be looking for site and locational information that gives details of associated species, management, population size and other attributes that will depend on the species in question. If anyone would like to contribute, here are examples from two of the pilot species we are currently working on. In future newsletters we shall be reporting on progress and appealing for further information. As part of the project, we are also setting standards for Local Records Centres and other data managers – 'nodes' in NBN parlance, and working with museums to make more use of their valuable collections.

- (i) If you know of any site where Pillwort, *Pilularia globulifera*, grows, we would very much like to know how much Pillwort there is (measure it in terms of square metres in extent and percent coverage within that area – e.g. 30% cover over 6 square metres) and we would like to know what species are growing within 2 metres of the population. Please attempt to distinguish the various *Juncus* species such as *J. foliosus* from *J. bufonius*, and the grasses – for example the different Sweet-grasses, *Glyceria* spp. The purpose of this information is to enable us to characterise better the vegetation communities in which Pillwort occurs, and compare that with data from the continent. It seems that central Europeans consider Pillwort a characteristic member of the community in which Golden Dock, *Rumex maritimus*, occurs, but in an analysis of 264 Pillwort sites in Britain, *R. maritimus* did not occur once.
- (ii) For those lowlanders who have lost all trace of Pillwort from their vicinity, the Scarce and apparently declining Grass-wrack Pondweed, *Potamogeton compressus*, is one that deserves more attention. It is by nature a plant of slow-moving water-bodies within natural river systems, having been recorded in the past from mill ponds, dammed streams and the backwaters of rivers. It requires clear water. But these habitats have been declining for two hundred years or more as a result of drainage and flood-prevention schemes, siltation and eutrophication. We believe that it has disappeared from its last native site in the Midlands in the last five years – the River Sow at Shugborough – and only the Norfolk Broads and the Loch of Aboyne now contain semi-natural populations. Please prove us wrong! It used to be fairly frequent along major river systems such as the River Soar near Leicester, the River Trent in Staffordshire and Derbyshire, and even in places along the Thames and Severn. We suspect that some backwaters may still contain populations, and if anyone does know of such a site, we would be very grateful to have a full description. The canal populations are also in decline, and it would be also valuable to have more information about those, especially around Birmingham and Manchester.

1999 is the Year of the Atlas, so we cannot hope to take up much of anyone's time with the TPDB. However, it will present some interesting opportunities for field work and desk study when the Atlas is out of the way, and we intend to bring you more details then.

SARAH WHILD & ALEX LOCKTON, 66 North Street, Shrewsbury SY1 2JL.

Tel. & Fax: 01743 343789; e-mail: s.j.whild@bham.ac.uk or alex@whild.icom-web.com

RECORDERS AND RECORDING

AMENDMENT NO. 1 TO *BSBI YEAR BOOK 1999*

Panel of Referees

Change of address:

Mr M.J. Southam, our referee for general Apiaceae has moved to: 1 Penton Road, Twyford, Winchester SO21 1PG

It would be useful to know if any referees who have e-mail addresses would like them to be given in the *BSBI Year Book*, so that, for example, members seeking help could check beforehand if you are ready to receive specimens. If you would like this information or indeed your telephone number to be printed with your address in the *Year Book* please let me know.

MARY CLARE SHEAHAN, 61 Westmoreland Road, Barnes, London SW13 9RZ; tel. 0181 748 4365
E-mail: m.sheahan@rbgkew.org.uk

V.c. Recorders

New appointments

V.c. 73 Kirkcudbrights. Mr D.M. Hawker, Windywalls, Gatehouse of Fleet, Castle Douglas, DG7 2DE

Change of address

V.c. 1a Cornwall Dr C.N. French, 12 Seton Gardens, Camborne, Cornwall, TR14 7JS
V.c. 5 S. Somerset Mr P.R. Green, Corners, 21 The Cross, Ilminster, Somerset, TA19 0EH

Correction to address

V.c. 96 Easternness & Mrs M. Barron, Same address but postcode is IV2 6DH
Nairns.

DAVID PEARMAN, The Old Rectory, Frome St Quintin, Dorchester, Dorset, DT2 0HF

BUTTERFLIES FOR THE NEW MILLENNIUM

As well as Atlas 2000, work on a 'Butterfly Atlas for Britain and Ireland' is also in progress. Butterflies are well known to be expert botanists, so if you are working on Atlas 2000, or visiting, why not also record butterflies in IRELAND. Recording forms are available from the undersigned but data may also be sent electronically. Information for the period from 1990 is our first priority if you are extracting data from notebooks.

DAVID NASH, 35 Nutley Park, Dublin 4, Ireland. Tel: +353-1-269-7469; E-mail: nashd@indigo.ie

NOTES ON THE SUITABILITY OF HANDHELD GPS FOR FIELDWORK

Introduction

It is clear that there is interest amongst botanists as to the usefulness of handheld GPS (Global Positioning System) sets, with the cheapest now c.£100. The following article endeavours to set out what you can reasonably expect from one of these devices. The two main brands in the UK are Garmin and Magellan, who offer broadly similar ranges, but there are others as can be seen in the reviews in *Yachting Monthly* (Sept. 1998, pp. 62-65) and *Sailing Today* (Feb. 1999, pp. 44-51; the March 1999 issue has a re-test of the Apelco). Descriptive brochures, advice, and competitive prices are available from boat equipment suppliers; adverts can be found in boat and yacht magazines. The bias of some sets towards the needs of the marine market is of no real disadvantage, displays can be set to nautical, metric or statute units, also the sets should be waterproof! Most, if not all, handheld sets on the UK market can deliver positions on the Ordnance Survey grid as well as by latitude and longitude.

As with so many items of consumer technology, specifications and prices change rapidly – my once top-of-the-range 8-channel Garmin GPS 45 bought autumn 1995 is now obsolete! Because of this I sought help from Garmin Europe on the impact of newer technology, and am grateful to them for the loan of their current entry level model, the GPS 12, for tests alongside my existing set. The Ordnance Survey also provided two accurate grid references for my tests.

At these prices, GPS is not going to take you to a particular plant, a modern set should in most cases get you to within a 50 m radius of the true position, or an area roughly equal to a football pitch. Under good conditions I found 80% of the points were within c.35 m, which halves that area. Like any computer-based device the principal of ‘Garbage In, Garbage Out’ applies, including the problem that if you are trying to re-find a point with its own attached uncertainty, the search areas given above will enlarge rapidly. Botanical uses fall into four categories: navigation, position fixing, location recovery, and mapping, and prospective users will need to understand something of the limitations imposed by the system for each activity.

Used as an aid to terrestrial navigation in unfamiliar or featureless territory, especially in poor visibility, GPS can be invaluable, and the older sets will do this quite adequately. In mountainous country, woodland, or deep valleys, position fixes may be poor. Good modern maps are still needed to provide, or use with, the grid references and to identify any hazards that may exist on the chosen route. A simple compass is still useful and should be carried as a back-up.

Basic GPS is also useful for providing indicative locations of plants. The 1:50000 scale maps do not have field boundaries marked, and other features such as roads are not to scale, a 6- or 8-figure O.S. grid ref. from a modern GPS is probably going to be more accurate, and certainly more convenient, but the possibility of rogue GPS fixes still exists. In general, ANY important fix should be checked against map features where possible, and qualified by comment where appropriate. Modern O.S. maps have a high intrinsic accuracy, and should not be ignored. Where feasible, an 8-figure O.S. ref. taken from well marked topographical features on a 1:25000 scale map is to be preferred to a single GPS fix. GPS can also be used to identify a convenient landmark from which smaller distances can be measured if you want to revisit a site. For most botanists it is probably not worth going beyond a basic GPS of modern specification (viz. true parallel 12 channel capability) unless the extra facilities described later are really needed.

Efficient location recovery requires both initial and subsequent linear errors in fixes to be reduced as far as possible, and research workers who regularly need to recover locations such as permanent quadrats, or are engaged in mapping and can accept the extra cost and size implications should look at DGPS (Differential GPS) but will need to check whether the additional radio signal needed is functional in their area. Detailed mapping including individual plant locations would require even more accurate, and expensive, survey class equipment using phase discrimination technology.

Brief technical details

The GPS system uses a set of 24 satellites in various orbits to create ‘visibility’ of at least 8 satellites from any one point on the ground. They each transmit their identity and a stream of time signals from

onboard atomic clocks. The radio signals are weak and easily blocked by solid objects, e.g. buildings and hills. (You may need to move to a more open or higher position – the satellite status or ‘sky’ display will tell you where the problems are.) Garmin’s claim that their latest sets will now work in woodland seem to be correct, if it is not too dense. Other problems are possible – not all the satellites may be working, those that are may be in an unfavourable configuration, usually 6 or more satellites are needed to give a reasonable quality of fix.

The handheld GPS set consists of a dedicated radio receiver and computer scanning up to 12 satellites in rapid series, or in parallel in modern sets. An LCD display, and a simple keyboard allows access to the various functions through menus. Power comes from 2 or 4 AA cells, preferably manganese-alkaline, giving 10-24+ hours use. Rechargeable batteries can be used, but tend to run out without warning.

All give the basic navigational data such as position, bearing and distance to the next waypoint, and only if you are moving, your speed and current direction or track. Various graphics may repeat, or supplement this data. Waypoints can be pre-entered and stored, grouped into routes, or fixed (‘marked’) as needed *en route*.

Facilities on higher price or more recent models may include external aerial and power supply sockets, computer interface using NMEA or other protocol for 2-way exchange of data or to drive plotters, DGPS readiness, and greater amounts of memory for waypoints, routes, primitive maps etc. They also tend to have more sophisticated software, and displays which can become less readable as more information is shown. Accessories for GPS may seem expensive compared to the price of the set itself. Modern sets no longer need an external aerial to work in a car, provided they can be fixed in a suitable position near the windscreen (not over demisters) but use by drivers is now being discouraged.

Before first use with O.S. maps, both position format (grid) and correct map datum (geodesic system) must be selected for Ordnance Survey GB. If not used for a while, or the set has moved a long way since last used, they can take several minutes to recalculate the satellite almanac – I leave it to do this while I am putting my boots on, etc. and then fix my starting position by using the Man Overboard function! Subsequent fixes can come up in only 15-20 seconds.

Accuracy in use

The table below gives the number of fixes I found in each error band from true for the 2 sets, a total of 149 points each, at 1 minute intervals in 15 runs over 3 days.

| METRES | 0-10 | 10-19 | 20-29 | 30-39 | 40-49 | 50-59 | 60-69 | 70-79 | 80-89 | 90-99 | 100-109 | 110 |
|---------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|-----|
| GPS 12: | 17 | 42 | 43 | 25 | 13 | 7 | 1 | 0 | 1 | 0 | 0 | 0 |
| GPS 45: | 11 | 29 | 33 | 27 | 15 | 12 | 6 | 4 | 1 | 3 | 2 | 6 |

The average error was 25.2 m for the GPS 12 and 37.5 m for the GPS 45. Eight of the ten worst errors for the GPS 12 were the first or second points taken after switch-on – it would seem advisable to let it settle for a couple of minutes before recording data, or starting an averaging run (see below). The ability of this set to pick up extra satellites low in the sky undoubtedly contributes to the good performance, while the GPS 45 results are in line with the ‘SA’ specification described next. For navigation between waypoints the two sets gave virtually identical results, so I shall not be selling my GPS 45 yet!

The main constraint on accuracy is that the signals are deliberately degraded, so-called ‘Selective Availability’ (SA), by the US Dept. of Defense to lessen the risk of hostile misuse. The effects of SA are quite obvious, and the fixes, particularly on those sets with 10-figure grid reference displays (viz. to 1 m) will change almost constantly. To avoid problems when starting from rest or moving slowly on difficult ground, transfer the calculated bearing to your next destination from the GPS to your compass and follow that. (Automatic correction for magnetic variation can be done by the GPS set.) On approaching a target try and remember the line of approach from some 2-300 m out, this should help limit your search area. GPS graphic displays tend to lose the waypoint when you are very close, and it

is easy to start wandering around in circles. It can then help to compare the grid ref. display with the target grid ref. – you soon get the knack of reading just the last 2 or 3 significant figures of the co-ordinates

The errors introduced by SA are statistically controlled (Normal Distribution) so that 95% of fixes should be within 100 m of true, (and 50% within 35 m) but a very few of the remaining 5% may be several hundred metres out. They can be overcome by use of 'Differential GPS' (DGPS), but at significant costs for additional equipment and the service. DGPS relies on the presence of a base station of accurately known position within 240 km (150 miles) of the user, so that it receives the same 'footprint' of satellite signals, and the same errors. It then transmits a correction signal which can be used by a suitably equipped set to allow position fixing to 2 or 10 m.

Either type of GPS can be improved by averaging fixes over time. It is possible to manually average several fixes by splitting the eastings from the northings, summing each, taking the average and recombining them. However at least 5 stable fixes taken at 5 minute intervals (viz. taking 30 mins. or more in practice) are needed to provide a worthwhile improvement. The GPS 12 gives the option of averaging a fix before saving it, which I have not had time to test thoroughly, but users should be aware that over periods of a few minutes, the effects of SA could make the fix worse. Altitudes given by GPS are not reliable, SA causes the vertical error to be 3× the horizontal error.

It is worth noting that the earlier 1:50000 maps, and the still extant 1 inch:mile Tourist maps based on the same older surveys can be inaccurate, especially in more remote areas. Also the locations of cliffs, and spot heights taken as summits, will sometimes be found to differ on the various maps and it is already all too easy to fall over something while your attention is fixed on the GPS. Finally, if you are comparing GPS fixes with positions obtained by 3 compass bearings, even assuming that both magnetic and grid variations have been properly accounted for, there is statistically only a 1 in 4 chance of the true position lying within the 'cocked hat' enclosed by the 3 bearing lines.

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NOTES AND ARTICLES

PILULARIA GLOBULIFERA (PILLWORT) NOT IN WEST CORK (H3)

This short note corrects an error which appeared in *Irish Botanical News* 9 (1999) and was circulated to Irish BSBI members (and a small number of others) in March.

In an article entitled 'BSBI Field Meetings held in Co. Cork, 1998, Glengarriff' (v.c. H3), 30-31 May' and communicated by M.J.P. Scannell, a sentence on page 40 ends:

'. . . we also noted *Fuchsia magellanica* (Fuchsia), *Myrica gale* (Bog-myrtle), *Vaccinium myrtillus* (Bilberry), *Lonicera periclymenum* (Honeysuckle), *Cytisus scoparius* (Broom), *Carex binervis* (Green-ribbed Sedge), *C. flacca* (Glaucous Sedge), *C. ovalis* (Oval Sedge), *C. panicea* (Carnation Sedge), *Pilularia globulifera* (Pillwort), *Dryopteris aemula* (Hay-scented Buckler-fern) . . .'

When the original typescript arrived with the editor, the latter part of the wording ran:

'. . . *C. ovalis*, *C. panicea*, *pilularia*, *Dryopteris aemula* . . .'

When the typist came to this sentence, she recognised the word '*pilularia*' as a generic name and capitalised the first letter, making it *Pilularia*. Editorial work then compounded the error by adding a specific epithet and a common name – thus *Carex pilulifera* (which had been intended) became *Pilularia globulifera*.

P. globulifera does NOT occur in H3, H4 or H5; the species was never recorded in Cork county. Today, according to the *Irish Red Data Book*, it is now known from only eleven of its former 23 sites

in Ireland. *P. globulifera* is also a threatened species in Europe and comes under the terms of the Bern Convention. In May 1998 *Carex pilulifera* was seen and listed for H3 on the official BSBI card.

The author and the editor of *Irish Botanical News* wish to express regret for the error and request that plant recorders take note of this correction.

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A NEW *BROMUS* ?

It was Len Margetts who first drew attention to an annual brome-grass of intermediate morphology. In 1977 he sent a specimen from the N coast of Cornwall to C.E. Hubbard who thought that it was *Bromus commutatus* var. *pubens* or (?)*Bromus commutatus* × *B. mollis*.

During field work for BSBI Atlas 2000 the same grass has been found frequently in wet meadows, corners of fields and on waysides in 24 hectads of Devon, Margetts has also identified the grass in Somerset and in other localities in Cornwall, and T. Cope has determined the grass from two localities in Cardiganshire. For the purpose of this preliminary note only, this grass will be called *B. hordeaceus* '*longipedicellatus*'. During the same field work in Devon *B. racemosus* (Smooth Brome) was found in 14 hectads, *B. commutatus* (Meadow Brome) in only one and *B. commutatus* var. *pubens* Wats. also in only one.

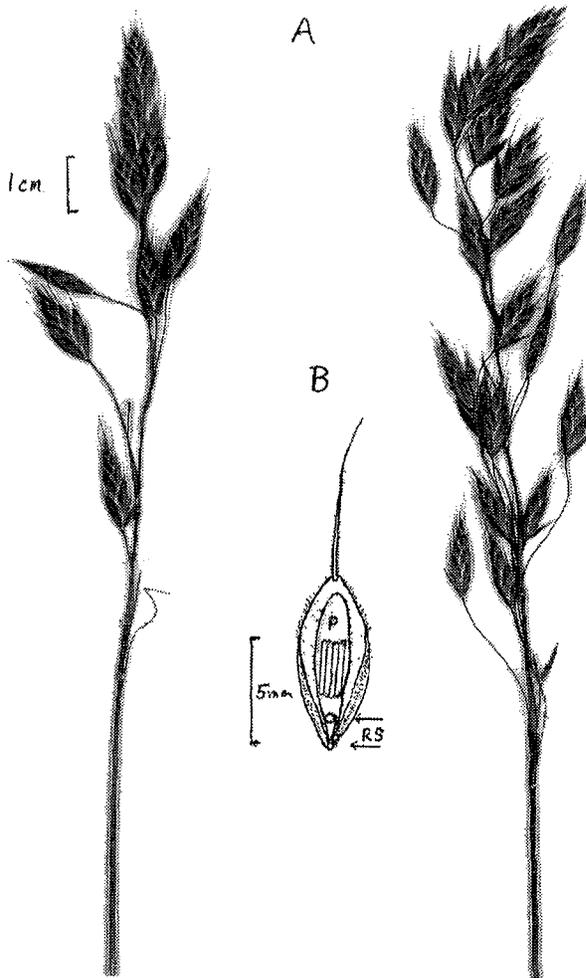
The inflorescence of *B. hordeaceus* '*longipedicellatus*' is loose and resembles that of *B. racemosus* or *B. commutatus* with at least some branches and/or pedicels exceeding 2 cm but the lemmas are pubescent (see Fig 1A). The indumentum of the lemmas varies but the hairs are usually shorter than those on the lemmas of *B. hordeaceus* subsp. *hordeaceus*.

Very importantly, the lemmas are papery and usually with prominent veins (best seen under lateral light) and not horny with obscure veins as in *B. racemosus* and *B. commutatus*. Some authorities describe the lemmas of *B. commutatus* and *B. racemosus* as 'coriaceous' (leathery); 'corneous' (horny) is preferred (Smith & Sales (1993). The texture of the lemmas can be assessed by removing a few and then prodding them with a blunt needle. To begin with, papery lemmas from *B. hordeaceus* and horny lemmas from *B. commutatus* or *B. racemosus* can be used as comparative controls. Only mature spikelets should be examined but not late summer material as the lemmas of all bromes tend to harden in the fruiting stage (Smith 1972) and the anthers of late material are atypically small (Smith & Sales 1993).

The margins of the lemmas are more or less bluntly angled like those of *B. hordeaceus* and *B. commutatus* and not smoothly curved as in *B. racemosus*. On specimens examined so far the spikelets of *B. hordeaceus* '*longipedicellatus*' measure 13-20 mm and the basal lemmas 7.8-10.3 mm. Mature anthers, which are rarely exerted, are rather large, measuring 1-3 mm, and the lowest rhachilla-segment is 0.7-1.3 mm long. This is measured between the first and second lemma to the centre of any oblique scars and corrected for curvature (see Fig 1B).

So what are the possibilities if an annual brome is found that has the 'jizz' of *B. racemosus* or *B. commutatus* but also has hairy lemmas?

It will be remembered that *B. commutatus* and *B. racemosus* have horny lemmas and these are considered to be fundamentally different from the papery lemmas of *B. hordeaceus* and of *B. hordeaceus* '*longipedicellatus*'. The lemmas of *B. racemosus* are glabrous (Smith 1973) and/or minutely rough (Sell and Murrell 1996) and those of *B. commutatus* are similar except for *B. commutatus* var. *pubens* which has hairy lemmas. This resembles *B. commutatus* in all other respects but the indumentum varies though it is always much more pubescent than the very minute hairs sometimes visible under the microscope at 30× on the lemmas of *B. commutatus*.



1A. Photocopy of the inflorescences of 2 specimens of *Bromus hordeaceus* 'longipedicellatus' from Devon. **1B.** Sketch of the underside of a basal floret. **P** = palea with an outline of the anthers enclosed by it. **RS** = rhachilla segment. The long 'eyelash' hairs on the palea occur in most annual bromes and are not diagnostic.

In summary *B. hordeaceus* 'longipedicellatus' differs from:

B. hordeaceus in its more loose inflorescence with longer branches and pedicels causing it to resemble *B. commutatus* or *B. racemosus*; in its much larger 1-3 mm anthers (*B. hordeaceus* usually less than 1 mm, Smith 1980) and its shorter hairs on the lemmas.

B. racemosus in its papery and pubescent rather larger lemmas with the lemma margin broadly angled and not smoothly curved.

B. commutatus var. *pubens* in its papery lemmas, shorter branches and pedicels, larger anthers and usually shorter lowest rachilla-segments.

B. commutatus is similar to *B. commutatus* var. *pubens* except that the lemmas are glabrous or minutely rough.

Some authorities (Clapham 1981, Stace 1997) describe the lemmas of *B. commutatus* as rarely pubescent, i.e. var. *pubens* is considered to be rare. However Smith in 1965 described *B. commutatus* var. *pubens* as a quite common variety. This grass may have declined since 1965 and it seems to be rare in the Eastern counties now but in some other localities it is thought to be under-recorded. If a taxon is said to be rare it is not expected to be found and it is therefore rarely recorded, particularly in a group where identification is not easy, thus perpetuating the reputation of rarity.

B. commutatus × *B. racemosus* (Wilson 1956) is occasionally found. It is intermediate between its parents and has horny and glabrous lemmas. In the Fielding-Druce Herbarium at Oxford there is a specimen of *B. commutatus* var. *pubens* × *B. racemosus* collected by Palmer in 1964 determined by P. Smith in the same year and confirmed by him in 1989, and as would be expected the lemmas are horny and pubescent. This specimen was found near Oxford in a part of England where *B. commutatus* var. *pubens* is rather frequent today.

It will not be easy to establish the taxonomic status of *B. hordeaceus* 'longipedicellatus' but some suggestions have been advanced.

One hypothesis by H. Scholz (1999) is that there may have been a gene transfer from *B. racemosus* to *B. hordeaceus* via crosses and backcrosses that resulted in the extinction of *B. racemosus* at some localities and gave rise to a new taxon or even species with predominant *B. hordeaceus* characters.

Another hypothesis is that the grass may be *B. commutatus* × *B. hordeaceus* as suggested by Hubbard with similar introgression.

Although *B. commutatus*, *B. racemosus* and *B. hordeaceus* are tetraploid species with the same cytology (2n=28) it has proved to be exceedingly difficult to produce artificial hybrids in these largely cleistogamous bromes. According to Smith (1972) no fertile artificial hybrids of *B. commutatus* × *B. hordeaceus* or of *B. racemosus* × *B. hordeaceus* had been reported by that date in spite of considerable efforts to produce them. However Knowles (1944) *may* have produced fertile F₁ hybrids of *B. hordeaceus* and *B. racemosus* (Smith 1972, Stebbins 1981). Whatever its origin *B. hordeaceus* 'longipedicellatus' does produce viable seed.

The earliest herbarium specimen found that has now been determined as *B. hordeaceus* 'longipedicellatus' was collected in Devon in 1926 by G.H. Douglas (TOR). It could be an alien grass introduced as a contaminant of sown grass seed. So specimens were sent to five *Bromus* specialists who are very familiar with the genus in Europe, S.W. Asia, and the Mediterranean. Comments received so far are:

M. Kerguélen in Paris (1998) – the grass is a new variety or subspecies of *B. hordeaceus* sensu lato.

H. Scholz in Berlin (1999) – it may be a new taxon unnoticed until now and his hypothesis of its taxonomic status has already been mentioned.

T. Cope at Kew (1999) – the grass is a strange *B. hordeaceus* that certainly merits more investigation.

This is why more specimens and more information on its distribution are required please.

I shall be pleased and very interested to examine and determine specimens (sender please retain a second specimen if possible).

I wish to thank T. Cope, A. Copping, M. Kerguélen, L. Margetts, R. Payne, B. Ryves, R. Portal, H. Scholz and C. Stace for examining specimens and for helpful comments; and the Curators of the herbaria at BM, K, LIV, OXF, NMW, RAMM, RNG, SLBI, TOR, and of private herbaria for the

generous loan of material. I also thank those botanists who have already sent me specimens and hope that they will send me more and that others will also do so.

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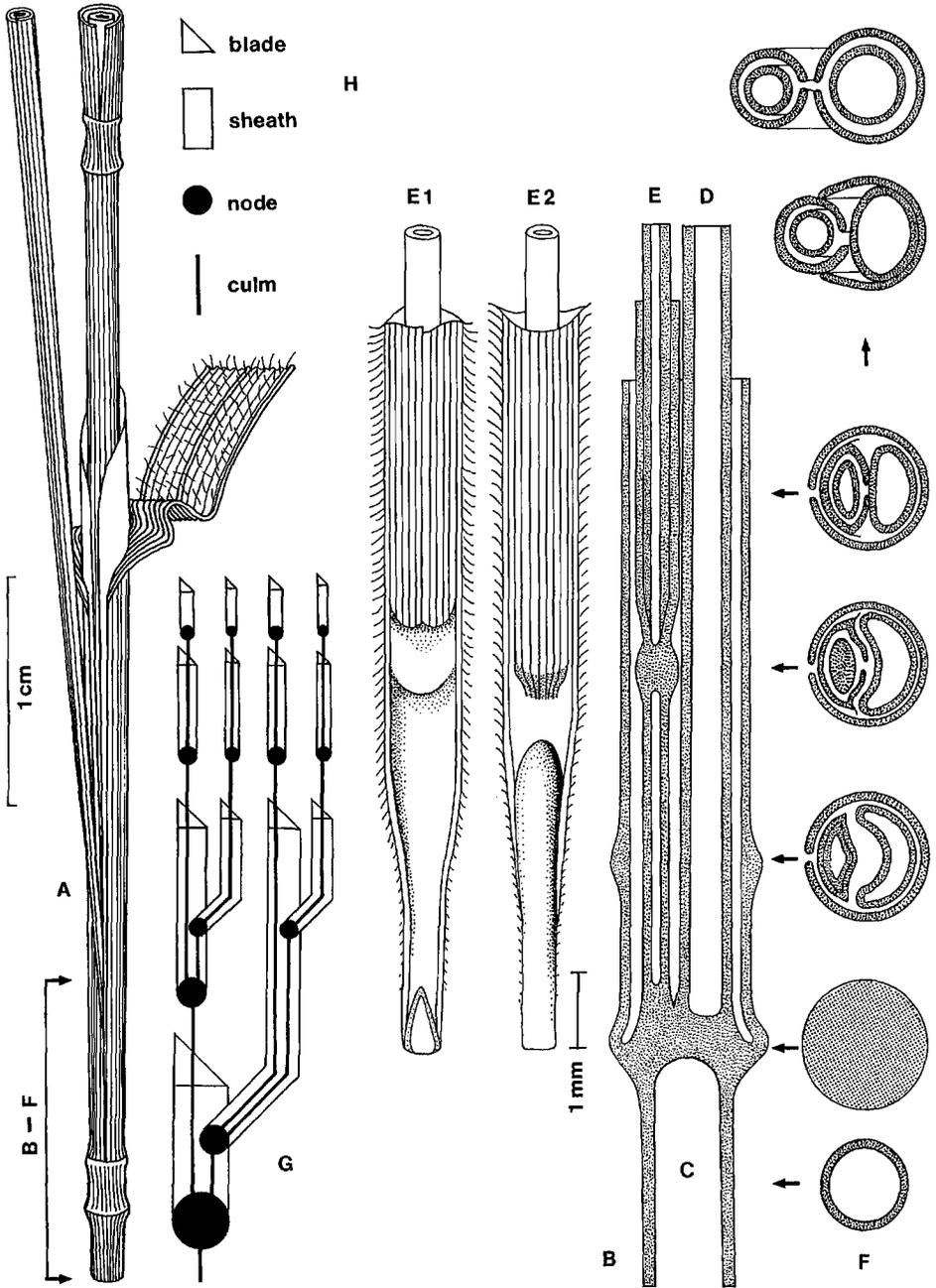
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CALAMAGROSTIS CANESCENS: A GRASS THAT BRANCHES

The culms (main stems) of Poaceae and Cyperaceae do not branch as readily as dicots; indeed this is a character typical of most monocots. Anyone seen any branched palm trees lately? Many grasses and sedges branch readily at, near, or below ground level, especially those that possess rhizomes or stolons, but rarely or never do so aerially. Branching is activated only at nodes, and since the culms of *Carex* spp. are nodeless from the base up to the inflorescence, branching is impossible. The same is true of *Typha* spp. (Bulrushes), but this is far from immediately obvious: all the leaves wrapping around the upright stem originate from mud level, and the stem of the inflorescence is thus essentially a very tall scape.

Most grasses possess several nodes along the main culms, but aerial branching normally occurs only if the stem is damaged in some manner: late season weather can be one cause. Proliferation (or proliferation) will be known to most readers in, e.g., *Deschampsia cespitosa* subsp. *alpina* (Alpine Hair-grass), but several common grasses can develop this trait, typically in wet autumns.

In the warmer parts of the world, many grasses have branched culms: non-branching bamboos scarcely exist! But amongst tall British grasses, it appears that only ONE native species invariably branches – it is an extraordinary (and little-known) fact that it is *Calamagrostis canescens* (Purple Small-reed). Indeed, in their weighty tome (of 1038 pp) *The Grass Genera of the World* (1992), Watson & Dallwitz insist that *all* the species (c. 230) have culms 'unbranched above': obviously it is a rare characteristic in the genus. Stace's *New Flora of the British Isles*, 2nd ed. (1997), and many other floras, fail to mention this character. When this species and *C. epigejos* (Wood Small-reed) grow intermixed, e.g., in the fen at Browdown (2.5 km W of my home), the two plants are easily distinguished from many yards away: *C. canescens* has a bushy appearance (due to the many branches): the much narrower leaves are also obvious (3-6 mm, instead of 4-10 mm wide). Incidentally, all keys tell us that *C. epigejos* has the upper side of the leaves 'not pubescent': this is not always true, *young* leaves can occasionally be somewhat hairy, as I first discovered on a woodland ride in Princes Coverts, Oxshott (Surrey, v.c. 17) back in July 1968.



Branching detail of *Calamagrostis canescens* (F.H. Wigg.) Roth del. D.P.J. Smith © 1998
(See text page 19 for details)

Delf Smith has studied the extensive *C. canescens* colony at Browndown (S. Hants, v.c. 11) which nowadays is often overlooked since the inflorescences have been very rare in recent years. It is apparently being overcrowded here by *C. epigejos*: indeed, panicles of *C. epigejos* very confusingly often emerge from the middle of the patches of leaves of *C. canescens*. Delf has produced the accompanying splendid drawing demonstrating precisely the mode of branching of the culm. It shows:

A. Portion of tiller culm showing one node with a branch; B. Longitudinal section of culm in branch zone; C. Primary culm below node; D. Primary culm above node; E. Secondary culm; E1. Outer view of basal portion of secondary culm and leaf sheath; E2. Inner view of same; F. Cross sections of culm(s) throughout the branch zone; G. Diagrammatic representation of same; H. Key to symbols used in fig. G.

One obvious fact revealed by this drawing is that in Hubbard's *Grasses* 3rd ed. (1984) the range of number of nodes along the culm (3-5) is clearly underestimated – 7 or more is quite normal. Hubbard's drawing shows a branched culm, but the fact is unmentioned in the text. In contrast, *C. epigejos* is only 2-3 noded and is shown as unbranched. The hollow and cylindrical culm, solid nodes and the leaf sheath split longitudinally to the base are all characteristic of most grasses and are all characters that typically differentiate them from sedges.

I am also surprised to read in Hubbard's *Grasses* under *Phragmites australis* (Common Reed), that the culm of this plant is 'usually unbranched': have I missed the occasional branches for all these years? Its close ally (YES! it is an error to use 'it's' here: writers please note) in S Europe, *Arundo donax* frequently has vegetative shoots developing from the aerial stem; I do agree with this observation. Better known is the fact that *Anthoxanthum cristatum* (Annual Vernal-grass) invariably has branched culms, but these never occur in *A. odoratum* (Sweet Vernal-grass) – a very simple distinction. Several other British aliens coming from warmer climes are typically branched – *Rostaria cristata* (Mediterranean Hair-grass), *Leptochloa fusca* (Brown Beetle-grass) and *Eragrostis* spp. (Love-grasses) are some examples appearing in Stace's *Flora*, whilst amongst the native element, low-growing species that often branch include *Agrostis stolonifera* (Creeping Bent), *Alopecurus geniculatus* (Marsh Foxtail) and both *Parapholis* spp. (Hard-grasses).

This short note is intended to be somewhat controversial: it needed more time and careful observation, but I throw it open to discussion by members. And yes! it is EJC writing about a non-alien plant!!

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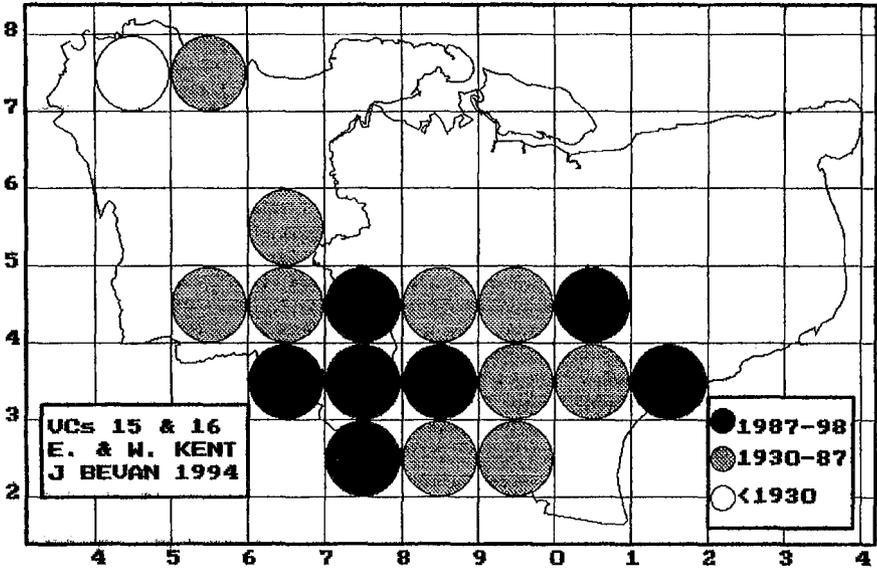
ANAGALLIS MINIMA IN KENT

This is a very small plant that needs a bit of publicity, I thought as I was reading *BSBI News* 79, only to discover that Simon Leach was ahead of me with *Spergularia marina* (Lesser Sea-spurrey). Unlike the *Spergularia* there is no evidence that *Anagallis minima* (Chaffweed) is spreading. In fact, looking through the recent literature, one might suspect that the *Anagallis* is in decline. Brewis, Bowman & Rose (1996) include a map with 21 tetrads where the species is presumed non-extant and the most recent dated record is from 1991, although Dr Rose, *in litt.*, assures me there are many recent records. Further north, Killick, Perry & Woodell (1998) state firmly, 'not recorded in this survey and presumed extinct'. Gillam (1993) makes no mention of the species, or so I thought until on p. 370 I came across Appendix IV, 'Species . . . not refound during the Wiltshire Flora Mapping Project' where *Anagallis* is among some 150 native taxa not refound. Grose (1957), under the old name *Centunculus minimus*, gives records from seven botanical divisions. It would be reassuring to hear of some recent records of Chaffweed from Wiltshire. Despite the gloomy presentation in some floras, I think the full distribution in Kent has never been worked out.

The oldest record from Kent is also the first record for Britain, 'Chisselhurst loco subudo (in a Dale just before the Common)' in *Synopsis Methodica Stirpium Britannicarum*, 3rd edn., 1724. I first saw

the species in Kent 270 years later in 1994, in company with Eric Philp. The following year we paid a visit on the 16th July to the type locality of *Hieracium cantianum*. We had no success at all with the hawkweed but we had the good fortune to notice *Scutellaria minor* (Lesser Skullcap) and then *Radiola linoides* (Allseed). Knowing from observations in the New Forest that *Anagallis minima* usually occurs near the *Radiola* I set to work to find the *Anagallis* and after some crawling on hands and knees the plant was discovered in a damp spot uphill from the *Scutellaria*. We went on to find both the *Radiola* and the *Anagallis* in the four tetrads covered by the wood. After this success we kept searching suitable localities and our last record that year was on the 30th September.

Anagallis minima -01.02.1999



The map above shows the hectad distribution in Kent, compiled from the 1963 *Atlas* and subsequent recording. During that time the plant has been recorded from three new hectads TQ/7.2, TQ/9.3 and TR/0.4.

Suitable habitat is still present in each hectad from which the species has been recorded, despite the many changes in agricultural practices in recent years. We therefore need a lot of luck in 1999 to refine it in the eleven hectads in which it has not been recorded since 1987. The discovery of the plant in TR/0.4 in 1998 was something of a milestone as the plant was in a wood on the chalk. This prompted a search for a mention of the habitat elsewhere. Good (1948) reports, 'it was surprising to find, during the Survey, that it is in fact not uncommon locally also in the grassy rides of certain woods on the chalk'. He also notes, 'it was recorded twice as frequently in woods as in its more familiar heathland habitats'. Finally he lists five species that have much in common geographically, *Anagallis minima*, *Aphanes arvensis* (Parsley-piert), *Gnaphalium uliginosum* (Marsh Cudweed), *Hypericum humifusum* (Trailing St John's-wort) and *Juncus bufonius* (Toad Rush).

Any would-be recorder of *Anagallis minima* should prolong the search when the last four species are found on a woodland ride, but do not expect success too often. In Kent *Centaureum pulchellum* is another species of woodland rides but occupies drier, stonier spots, even places where rides are made up with ash or broken bricks. This species only opens its flowers on bright sunny days but again a search for *Anagallis* is worthwhile, downhill in any damp hollows. However if you reach *Scutellaria minor* or that arch-imitator of *Anagallis*, *Lythrum portula* (Water-purslane), you will be on ground that

is too wet. In Philp (1982) there are seven times the number of tetrad records for the *Lythrum* so great care is needed to confirm the identification. To discover *Anagallis minima* unless you have very good eyesight or are under five feet tall you need to be on hands and knees. So any time from the beginning of July to the middle of October join the select few and discover Britain's smallest land plant for yourself.

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MORE ON ENDANGERED JOURNALISTS

Like David Dupree, I read the article to which he refers in the *Daily Telegraph* and was amazed by it. Or was I? As a chemist I have more or less got used to strange spellings or even unrecognisable names for chemicals, all of which seem to be deadly poisons or highly explosive or inflammable if you look at them. Often they are all three to make a better story even if this is far from the truth. As a biologist I am resigned to the fact that no journalist ever gives a Latin name correctly. We may see *bellis perennis*, or *bellis Perennis* or even *belli sperennis* but seldom anything better. Bacteria and fungi are usually singular and any grassy bank about to be ploughed up is the home of 'rare orchids and blue butterflies'. Articles written by 'Our Science Correspondent' are frequently full of mistakes. Even so, in the article in question, as David says, it is hard to believe either that anyone could make up such a list or that it could be provided for journalists. Should the BSBI and other similar bodies try to draw inaccuracies of this type to the attentions of the authors and/or publishers? And would it do any good?

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VULPIA MEMBRANACEA, *V. FASCICULATA*, (AND *V. PYRAMIDATA*) – 30 YEARS ON

I was interested by the mention in *BSBI News* 80 (Jan. 1999), of the true *Vulpia membranacea* (L.) Dumort. seen during a field trip to northern France. I looked at the taxonomy of this 'annual fescue' and the related British grass in the late 1960s and found that French botanists had for some time been able to distinguish two species, but using names reflecting a confusion dating back to Linnaeus. I would like to take this opportunity to comment on a complex history.

The name *Vulpia membranacea* is based on *Stipa membranacea*, described by Linnaeus in the first edition of *Species Plantarum* in 1753. No references are cited – it is a new species, and there is a single specimen, no. 94.9 in his herbarium, sent by Loeffling from Spain. This simplicity is deceptive. Botanists astute enough to realise it was, in the usage of the day, a *Festuca*, then faced the problem that Linnaeus had, by citing Scheuchzer, already included a similar plant in his *F. (=V.) bromoides*. Sir J.E. Smith, who bought Linnaeus's collections, and later Parlatores, puzzled over the relationship between the actual specimen no. 94.9, and the coastal grass by then known as *Festuca uniglumis* Solander, both deciding eventually that they were the same. The result was that for many years the Linnaean name was

largely ignored; a list of alternative names used, for both plants, can be found in Stace and Cotton (1976).

This early history of the genus, (*Vulpia* was created later by C.C. Gmelin in 1805) is included in major papers by Duval-Jouve (1880) and Henrard (1937), however, from the lack of first hand comment on the obvious peculiarities in the Linnaean specimens, it is my opinion that neither author saw them. In the UK, a move towards the modern usage can be seen in Wheldon and Wilson's *Flora of West Lancashire* of 1907, where they refer to the coastal plant as *Festuca fasciculata* Forsk., but for many years most botanists were content to use *Festuca membranacea* from G.C. Druce's *List of British Plants* of 1908. Even as late as the 1960s, after material at Kew had been matched by Dr N.L. Bor to specimen 94.9, its true identity was still being overlooked.

In January 1970 I examined Linnaeus's sheet no. 94.9 and realised that it was the same as the French (and Iberian) plant with the glabrous ovary depicted in Coste (1906) as *Vulpia longiseta* (Brot.) Hackel, which therefore was the true *V. membranacea*. This left the plant so-called in Hubbard's *Grasses* and 'CT&W' needing a new name. After checking the nomenclature, I sent a note a few days later on my observations for inclusion in the Typification File at the Linnean Society. The two main contenders were based on *Festuca fasciculata* Forsskål (1775) and *F. unigumis* Solander in Aiton (1789). The latter could be readily typified by British material, from Briton Ferry in south Wales, at **K** and **BM**, collected in 1773 by Banks, Solander and Lightfoot; for the former I ran up against the statement by Christensen (1922) that there was no corresponding specimen in Forsskål's herbarium at Copenhagen, and Forsskål's description was insufficient to identify which of the pair had been found.

Very shortly after, I came across work by another French botanist which seemed to indicate that there might in fact be three closely related species. Roux (1960) had obtained tetraploid chromosome counts of $2n=28$ from one Portuguese and several French coastal specimens, which he called *V. fasciculata*. Taken with previously published counts, he thought a succession existed from the diploid, $2n=14$, *V. longiseta* in Portugal (viz. the true *V. membranacea*), through France, to hexaploid, $2n=42$, members in the UK.

Stace and Cotton (1976) however established that the British population was tetraploid, not hexaploid, and on the basis of the then known distributions, apparently independently adopted the name *V. fasciculata* for it. This plant with the bristly apex to the ovary and seed, just visible with a $20\times$ lens, is found on the coasts of UK, France, Iberia and the Mediterranean east to Egypt, where it also occurs inland. *V. membranacea*, the diploid with the glabrous ovary, occurs mainly in France and Iberia, often inland. Importantly, they found most of the characters used in the past to separate the two are not on their own reliable or have significant overlaps.

Both species are quite variable, as cleistogamy will limit outbreeding. The diploid is particularly variable, it may well be the older species, but with each gene only present in duplicate rather than quadruplicate, I surmise that there is greater scope for the expression and perpetuation of single gene mutations. In the field, the diploid plant looks like a leggy or shaded *V. fasciculata* where the panicle becomes well exerted from the leaf sheaths, the florets are less scabrid, and an inland habitat is suggestive of this plant.

After a long period away from botany I recently decided to try and update myself, and I am grateful to all who have helped, both individuals and institutions (**LIV**, **K**, **BM**, **LINN**, and Liverpool University Libraries). I also wish to thank Sylwen Hamnett for her help in translation from French and German.

Dr J. Edmondson drew my attention to the book by Hepper and Friis (1994) which describes the ill-fated expedition of 1761-67 to Yemen, and lists a large number of Forsskål's specimens from it which have been refound at Copenhagen. Dr Hepper kindly sent me a photograph of sheet 1260, identified by Dr T.A. Cope (3/1983) and by Prof. C.A. Stace (11/1987) as *Vulpia fasciculata*. This specimen has been described as the holotype in the *Flora of Turkey* (1985). However, nothing in the genus *Vulpia* is straightforward, and curiously the only early name the sheet carries is *Festuca unigumis*, and the field label does not indicate it came from the type locality of Alexandria, Egypt.

For some reason Forsskål's name was not at the time associated with this specimen. The answer may lie in the neglect of the material on its arrival at Copenhagen, all bar one of the expedition

members dead, or the preparation of the *Flora Aegyptiaco-Arabica* by an unknown botanist of uncertain prowess. Dr Hepper showed me the earlier general account of the expedition by Hansen (1964), which is well worth reading for its account of the personalities involved and the hazards of 18th century travel.

With the help of *BSBI Abstracts* I found the paper by Stace and Jarvis (1986), part of the Typification Project, with its discussion of the Linnaean specimens and names now included in *Vulpia*. This paper also refers to the proposal by Lambinon (1981) that the name *V. membranacea* is a *nomen confusum*, to be replaced by *V. pyramidata* (Link) Rothm. As far as I am aware, it has not been formally accepted, and I feel the nature of the Linnaean specimen is now clear enough. The situation has echoes of the Forsskål story. We do not have the type of Link's *F. pyramidata* (1799), his herbarium was largely destroyed in the bombing of Berlin in 1943 and neither Link's original description, nor the new combination into *Vulpia* by Rothmaler (1943), contain the characters now needed to be certain which plant is being referred to. Link's locality is not much help either, it translates as 'In the deep sand on the other side of the Tagus', without saying where he is coming from, (I suspect it may be Lisbon).

I was however surprised to find in late 1998 what is probably an isotype of *F. pyramidata* as sheet 134.1 in the J.E. Smith herbarium at the Linnean Society in London. They have a letter from Link dated 4.1.1804 requesting comparison of the enclosed specimens collected in Portugal in 1797-98 with the Linnaean herbarium. Link did not provide a full list, and we do not have Smith's reply, but sheet 134.1 is one of the Link plants, labelled '*Stipa membranacea* ?' by Smith, and significantly Link dropped the use of his own name in later works. I have since, with the permission of Dr C.E. Jarvis, made a more detailed examination of specimen 134.1 and confirm it has the glabrous seed indicative of the diploid plant, and thus is also the true *V. membranacea*.

Although not listed in the *Flora of Turkey*, or *Flora Palestina* (1986), I have seen herbarium specimens I believe to be *V. membranacea* from both areas, and it may well occur elsewhere on the eastern Mediterranean mainland and islands. Botanists familiar with the UK species may be interested in looking out for both. Particular locations are the coast W of Alanya, southern Turkey (spec. at **K** coll. 4/1967 by C.C. Townsend), and sandy fields at Magdiel near Tel Aviv (specs. at **E** and **K** coll. 4/1928 by A. Eig). Also the coastal sandhills at Mauguio, near Carnon, SE of Montpellier France support plants of indeterminate character (spec. at **LIV** coll. 6/1977 by A. Dubois) which need further study. It might at some point be useful to look at the S side of the Tagus estuary to see if Link's plant does grow there.

The problems of ploidy level and overlapping species boundaries are not confined to the above, the genus *Vulpia* seems to get more confused as you go east. I was recently relieved to find these problems acknowledged by Prof. Stace in the *Flora of Turkey* – I had thought it was just me losing my touch!

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OENOTHERA (EVENING-PRIMROSES) – THE WAY FORWARD

Introduction

Not surprisingly there have been mixed reactions to the recent American revision of *Oenothera* section *Oenothera* subsection *Oenothera* which treats European *O. biennis* (Common Evening-primrose) and *O. cambrica* (Small-flowered Evening-primrose) as microspecies and puts them and many others from around the world into a variable *O. biennis*. From the same group, *O. glazioviana* (Large-flowered Evening-primrose) has been accorded specific status because 'it has very distinctive morphological features, and has, partly through cultivation, become widely spread around the world' (Deitrich, Wagner & Raven 1997; Bowra 1998).

Clive Stace considers that in Britain where we have so few species, 'the desire to recognise them as separate entities becomes, in my view, irresistible (at least to me), and I prefer to continue to call them species' (pers. comm. 1 May 1998). On the other hand, the late Douglas Kent had no doubts about the advantages of the new treatment 'which I shall certainly use in a revised edition of my *Plant List*' (pers. comm. 28 January 1998). After twelve years as BSBI referee, the latter is my own view: that it is better to adopt a revision that fits the true nature of this very unusual group of essentially clonal biennials than to keep a very much hybridised *O. cambrica*, a species without distinctive morphological features, unlikely to have spread beyond the British Isles.

Oenothera in Britain: a history of confused misidentification

O. cambrica was named by Dr (now Professor) K. Rostanski after a visit to South Wales in 1977 where he was shown colonies with a widespread and locally abundant form of *Oenothera* which had long confused British botanists. In some colonies *O. glazioviana* and/or its hybrids were also present (mostly near habitation) but *O. biennis* was considered absent: the species in Wales 'is known to occur only in the north' (Rostanski & Ellis 1979). The apparently identical plants had uniform stance, leaves and small flowers but the indumentum differed: most had hairs with red bulbous bases but others did not; and these he named var. *impunctata* (Rostanski 1982) – thus creating a 'variety' of plants which breed true like clones.

In the early 1950s, sea sand from near Margam in South Wales was used to extinguish a fire in a coal dump at Emscote near Warwick. In 1980, plants without red-based hairs were found in the resulting large, isolated and apparently homogeneous 'railway' colony of *O. cambrica*. Rostanski, who knew that *O. biennis* was dominant in the nearby larger three species 'main' colony on the site of a recently demolished power station, confirmed that these plants were hybrids with *O. biennis* (Rostanski 1982). In 1990, he confirmed as hybrids similar plants from South Wales (Bowra 1992).

During his visit to Britain, Rostanski also examined many herbarium specimens. I recently re-examined some from the Lancashire dunes which he had confirmed as *O. biennis*. All 16 had one

taxonomic character of *O. cambrica* while 14 had two or more and were undoubtedly hybrids (Bowra 1997).

It therefore seems apparent that Rostanski took no cognisance of *O. biennis* or *O. cambrica* characters unless the 'pure' plant was known to grow in the vicinity. He may have lacked confidence that the Lancashire *O. cambrica*-like characters were in fact from that species but their presence should surely have precluded determination as *O. biennis*. Hence, many of the distribution details listed in his *Watsonia* account (Rostanski 1982) must be in doubt.

I am told that homogeneous colonies of *O. cambrica* exist in North Wales including one of several thousand plants. This is possible; but using all the taxonomic characters (including the important indumentum (the frequency of glandular hairs also varies considerably between species)), together with the fact that except for very rare mutations, only one good extraneous taxonomic character in an essentially clonal plant is proof of hybridity, I have never found one. At Emscote in 1988, despite the strikingly uniform appearance of the South Wales-derived 'railway' colony of 812 plants, 52 plants from two random groups produced at most only eleven 'pure' *O. cambrica* (Bowra 1992) – but because of overlapping characters, identification of 'pure' species cannot be certain.

O. cambrica hybrids with *O. biennis* and/or *O. glazioviana* are also abundant in Lancashire. Unlike in Wales and occasionally elsewhere, 'pure' *O. cambrica* has not been found, but all of its taxonomic characters were seen in herbarium specimens except the longer than wide petals (but most petals were not measurable). Most frequent was the indumentum: out of the 16 specimens mentioned above, nine lacked the abundant glandular hairs of *O. biennis* and eight had red-based hairs (absent in *O. biennis*). Clive Stace also observed the indumentum (but without further comment): 'In parts of v.c. 59, all plants which resemble *O. biennis* in fact have many red-based hairs on the stems' (Stace 1975). These red-based hairs undoubtedly came from *O. cambrica*: if from *O. glazioviana*, one or more very distinctive characters would have made it apparent.

Large hybrid swarms can be created very rapidly: hybrids in the 'main' *O. biennis*-dominated three species colony at Emscote (which included 205 *O. glazioviana* and 134 *O. cambrica*) increased from c.10% of 2284 to virtually 100% of 4297 plants within eight years (Bowra 1992). I have in fact never found *O. glazioviana* or *O. biennis* in established hybrid swarms but the former is still grown in gardens and escapes are not infrequent while both occasionally persist in mostly small isolated homogenous colonies. In contrast, *O. cambrica* persists in established hybrid swarms but homogeneous colonies are at most very rare. Thus, the abundant population on the Lancashire dunes almost certainly consists of a mixture of annually back-crossing hybrids (going back to before 1832 (Bowra 1997)), possibly with the occasional *O. cambrica* but with *O. biennis* and *O. glazioviana* absent or confined to isolated pockets and the fringes.

Conclusion

The British history of the treatment and identification of these *Oenothera* is one of confusion. From Charles Bailey in and before 1915 (Bowra 1997), R.R. Gates in the 1920s and 30s who 'followed the pattern of giving specific names to every strain grown in the garden or observed in the wild which seemed a bit different from what had been seen before' (Cleland 1972, p.316), Rostanski who saw plants of compelling uniformity but misinterpreted the indumentum, and many others, our large truly wild and almost entirely hybridised population has perplexed and confused.

The new revision offers an opportunity to recognise the special genetic and behavioural realities. As Douglas Kent agreed, it should be adopted in Britain.

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SUPPRESSION OF OTHER TREE SPECIES BY ENGLISH ELM (*ULMUS PROCERA*)

In 1972, the 5 mature English Elms fringing the meadow south of my house in Wiltshire succumbed to Dutch Elm Disease. By 1974 there were no living suckers apparent above grass level. Articles and books subsequently appeared with strong nostalgic emphasis, lamenting the death of the Elm (Anon. 1978; Wilkinson 1978; Clouston & Stanfield 1979). Some Wiltshire Flora Mapping Project recorders did not record '*U. procera*' or even *U. glabra*, the Wych Elm, on the automatically mistaken assumption that English (or all) Elm species had become locally extinct. Self-styled (and even some genuine) experts and officials repeatedly harangued us in technical publications, ecology articles, newspapers, magazines, TV and the Radio to 'Root up and burn dead and diseased trunks, branches and suckers and plant other native tree species.'

I had started to follow these exhortations until I realised first the futility and second the foolishness of these propaganda barrages, then the ecological equivalents of 'Political Correctness'. Bean (1989) referred to all this 'Sanitation' (felling and burning) as merely 'slowing down the disease' or 'keeping the disease at a relatively low level'. Entomologists speaking on the BBC also objected to these orgies of felling and burning on account of wood-boring beetle larvae, their parasites and other endangered insects. Even if all this activity had been marginally helpful rather than actively harmful, was it worth all the trouble & expense?

Despite 3-4 year cycles of virulent and sub-virulent reinfestations, by the late 1970s local English Elm root suckers were recolonising. Leading suckers succumbing at 2 m were replaced by more numerous satellites reaching 4 m by the next pandemic recurrence 3 years later, then 7-10 m after 7 years. Suckering raced around the hedgerows, but was even more successful into waste areas and open meadows where permitted, because there were likely to be, per tallest sapling, 8-10 radial suckers in 2 dimensions, as compared with only 1-3 contiguous linear suckers in a narrow fence-line or narrow hedgerow. By the mid 1980s, the English Elm was again starting to dominate other hedgerow (and sometimes also riverside) woody species. Also the pandemic had ended, because reinfestations in this part of Wiltshire were by now out of phase. Not only were Wych Elms reinfected in different years from the English Elms, but the same clones of English Elm could suffer reinfestation in one segment of hedgerow whilst recovering or thriving only 10 m away.

By 1995 road- and field-side English Elm saplings were regenerating at 12 or more metres in sufficient density usually to out-compete 10 of England's most widespread native and naturalised tree species in at least 4 central English counties (Oliver 1996). I suggested then the possibility of natural biological controls, including alternative competing fungi, or subvirulence of the main Dutch Elm Disease fungus. Rose (1996) reported mature disease-resistant Wych Elms and Smooth-leaved Elms (*U. minor* agg.) and hybrids in Hampshire; but English Elms he considered to be reinfected from the root systems rather than just via the bark beetle vectors. Even so, suckers could reach 16 m. Coleman (1998) considered that the endemic Midlands Plot's Elm (*U. plotii*) to be the most disease-resistant British elm, but speculated that elm genetics were probably less important than attenuations of disease-virulence by benign strains of the infecting organism or protection by other organisms,

essentially similar suggestions to mine in 1996. Intensive and most impressive research by plant pathologists, mainly C.M. Brasier at the Alice Holt Research Station (Brasier 1983-1998 incl.) seems to have validated this line of thinking; but the subvirulence has developed as a consequence of the Dutch Elm Disease fungus itself becoming diseased. The sequence of pathology, if I understand it correctly, is as follows.

- 1) Two bark beetle species *Scolytus scolytus* and *S. multistriatus* (Bevan 1987) carry the spores of the fungus *Ceratocystis ulmi* or *Ophiostoma ulmi* to infect new branches of *Ulmus*, or the closely related genus *Zelkova*.
- 2) *Ophiostoma novo-ulmi* is responsible for the recent and highly destructive pandemic. It exists in 2 forms, the Eurasian (EAN) and the North American (NAN) (Sutherland & Brasier 1997).
- 3) D-factors are cytoplasmically transmitted 'virus-like' pathogens on *Ophiostoma novo-ulmi* (Brasier 1983, 1883-1998 incl.). They are likely to be the (main) natural biological control agents of Dutch Elm Disease (Brasier 1983, 1983-1998 incl., 1986).
- 4) D-factors are a new type of pathogen, mitochondrial double-stranded RNA elements. (Hong et al. 1998).
- 5) Of the 13 d-factors (Rogers *et al.* 1988), d², d³ and d⁹ had the most severe effect on *Ophiostoma novo-ulmi* (Sutherland & Brasier 1997).
- 6) D⁵, d⁶ and d⁸ may be the best controls of Dutch Elm Disease, as d², d³ and d⁹ may be too destructive to *Ophiostoma* to permit reliable transmission of sub-virulent *O. novo-ulmi* (Sutherland & Brasier 1997).

This seems a fascinating example of Nature's complex checks and balances!

Our local English Elms have reached 11-13.5 m. Despite being vulnerable to Dutch Elm Disease, they are not subject to the catastrophic infestations causing the death of certain Wych Elms in the vicinity, the exact reverse of the two elm species' relative vulnerabilities in 1974. Many trunks in this 0.2-0.3 ha English Elm wood are forked near the base, and some vertical trunks arise from fallen, twisted and otherwise contorted horizontal trunks. There are many trunks which measure between 30 and 100 cm in circumference at 1.5 m [5 ft] from the ground. These are, on average 2.5 m apart (see photo, page 29). Younger suckers, 20-400 cm in height were on average 1 m or less apart. 15 or so dominant grass species have now succumbed to a ground cover of Cow Parsley (*Anthriscus sylvestris*), in turn starting to give way to Ivy (*Hedera helix*) and Wood Avens (*Geum urbanum*). Ramsons (*Allium ursinum*) Lords-and-Ladies (*Arum maculatum*), Bluebells (*Hyacinthoides non-scripta*), Lesser Celandine (*Ranunculus ficaria*) and Snowdrop (*Galanthus nivalis*) are starting to colonise. The ground is a north-facing slope, chalk capped with clay. In late summer, if one or more leaders above the dense elm canopy are denuded by Dutch Elm Disease, there are often concentrations of encircling House Martins, Swallows or Pipistrelles, perhaps suggesting an additional biological control. Are the beetle vectors being preyed upon?

Ash (*Fraxinus excelsior*), Elder (*Sambucus nigra*), Field Maple (*Acer campestre*) Sycamore (*Acer pseudoplatanus*), Hazel (*Corylus avellana*) and Hawthorn (*Crataegus monogyna*) have always been the most successful trees to seed themselves in the vicinity. These 6 species had all produced seedlings and saplings in the area which is now an English Elm wood; they are all around, but not in the wood itself, having all been shaded out, or killed by root or rhizome competition. Similarly all the natural *and* introduced seedlings and saplings of Pendunculate Oak (*Quercus robur*) and Horse-chestnut (*Aesculus hippocastanum*) have been totally eliminated. The suckering species Blackthorn (*Prunus spinosa*), Hybrid Sloe (*P. × fruticans*) and Wild Cherry (*P. avium*) have also given way to the English Elm suckers despite the success of Hybrid Sloe and Wild Cherry suckers against other woody species. Other established deciduous trees which are competing poorly include Silver Birch (*Betula pendula*), Crab Apple (*Malus sylvestris*) and Laburnum (*Laburnum anagyroides*). The elm wood has reached 4 established conifers, Lawson's Cypress (*Chamaecyparis lawsoniana*), Norway Spruce (*Picea abies*), Atlas Cedar (*Cedrus atlantica*) and a Wellingtonia (*Sequoiadendron giganteum*). All 4 have lost most or all their greenery on the sides of the English Elm suckers, the Wellingtonia in particular now bald on 3 sides and arcing about 2 m away from its base, away from the invading elm suckers. Two Scots Pines

(*Pinus sylvestris*) of 4 m before elm suckers were anywhere near them will, I think, be dead before the new millennium.

Apart from the massive long-established ancient oak and ash trees, which of the younger and more recently established trees have resisted the elm onslaughts? Two (introduced) Holly (*Ilex aquifolium*) plants are surviving under the densest part of the elm canopy. Leyland Cypress × *Cupressocyparis leylandii*, planted since the renaissance of the elm suckers is wholly unaffected, losing no lower greenery where the elm colonises. In fact, pioneer sucker tufts die near the base of the Leyland Cypress. They can only progress by a long circuit skirting widely around this remarkable intergeneric hybrid.

Despite the persistence of Dutch Elm Disease, English Elm, even in its diseased state can partly or wholly suppress at least 19 familiar tree species most of which are natives or well naturalised in Wiltshire. These are not just isolated observations, as Wych Elm recovery and regeneration after the Dutch Elm Disease pandemic has been studied in Lady Park Wood: '23 years after the outbreak of disease, the number of elm individuals has increased by 40%. Disease has continued to afflict vigorous, exposed individuals . . . The elm population appears to be differentiating into (1) a large high-turnover subpopulation of fast-growing, but repeatedly diseased maiden individuals and sprouts, and (2) a small, low-turnover subpopulation of slow-growing individuals rooted in suboptimally dry, secluded sites.' (Peterken & Mountford 1998).

The Lady Park Wood Wych Elms regenerated by seed as well as by 'substantial and vigorous regeneration from rootstocks of infected trees'. My English Elms have only regenerated by the latter process, but more like 400% than 40% recovery. It would appear that they have had two growth phases in recent decades, if not over millennia. These are:

- a) Mature traditional elms to 40 m or more, with rare production of seed, but mostly reproducing by suckering.
- b) Dense suckering suppressing other woody species monopolistically (as stinging nettles suppress herbaceous and some woody species, Crawley 1989).

Here survival depends largely on Brasier's d-factors and their interactions with the fungal pathogen *Ophiostoma*. Satellite suckering appears to become more vigorous and extensive whenever the 3-13 m parent trunk is afflicted by Dutch Elm Disease, suggesting the diversion of growth factors from single vertical stems to monopolistic dense radial colonies with occasional outlier tufts up to 15 m distant from the affected trunks.

If indeed this biphasic life-form of the English Elm is a long-term adaptation over millennia to the *Ophiostoma* versus d-factor balance, the uprooting, burning and destruction of English Elm colonies and clones in the 1970s, 1980s and 1990s was bad science and very bad conservation; merely fussy, destructive and extravagant large-scale landscape gardening.

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Dense monopolistic suckering to 13 m. A small but new Elm Wood in Wiltshire, February 1999
(all trunks are *Ulmus procera*) photo J. Oliver © 1999

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NETTLE AND OTHER HERBACEOUS PLANT MAXIMA

David Pearman visited the Bottle Inn, Marshwood, Dorset in February 1999 to find out more about their yearly Common Nettle (*Urtica dioica*) contest records. 4.2-4.8 m (14-16 ft) is now their standard entry range. Vertical heights from the ground are measured, not including either stolons or rhizomes. A 7.5 m (25 ft, tree height) nettle had been grown inside a concrete pipe.

Those BSBI members who are regular habitués of pubs may know secrets of artificially encouraging exceptional plant growth, as with leeks (*Allium porrum*) in NE England. However, bracketed maxima in all standard floras are inadequate for a number of farmland weed species.

Roadside and dry hedgerow nettles may conform to the limited permitted height ranges, but riverside, ditch, woodland and farmland fringe ones often do not. The Wiltshire record for a naturally growing nettle is 3.4 m (11ft 4 ins), but this was not an isolated freak. In September 1996, extensive parts of a vast nettle-bed covering several hectares in and around the upper reaches of the River Marden near Calne had a *main canopy* of 2.10-2.55 m (7-8½ ft), topped by a few leaders to 2.85 m (9½ ft). In 1996 & 1997 several nettles over 2.7 m (9 ft) were found in N Wiltshire, even on chalk. The maximum height permitted in Stace (1997) is still a puny 1.5 m (5 ft); clearly wrong if one is over 1.8 m (6 ft) and regularly suffers stings to ears and forehead in certain nettle-beds. CTM (1989) permits an exceptional 2.5 m, (8ft 3 ins) but even this can be a sub-canopy height in some Wiltshire nettle-beds in some years.

For the Great Willowherb (*Epilobium hirsutum*) Stace gives 1.8 m (6 ft) vs CTM's 1.5 m (4 ft 10 ins) as the maxima; but in agricultural areas, 7-9 ft (2.1-2.7 m) specimens can be common. The corresponding Rosebay Willowherb (or Fireweed, *Chamerion angustifolium*) maxima are Stace 1.5 m (5 ft) and CTM a feeble 1.2 m (4 ft); but this plant, especially during its initial colonisation phase can often reach 1.8-2.4 m (6-8 ft) in height. Similarly on manure heaps, near silage, on dumps, by barns and near milking areas, members of the Chenopodiaceae such as Fat-hen (*Chenopodium album*), Red Goosefoot (*C. rubrum*) and Common Orache (*Atriplex patula*) often grow *very* much bigger than 1.5 m, 80 cm & 1 m respectively (Stace 1997).

Much of Britain is farmed, and a number of species may either have developed genetic strains to compete with rapid-growth grasses and weeds, or have the inherent capacity to double or treble their 'normal' heights in conditions of nitrate and phosphate enrichment. Some plant species like agricultural land. Restriction of size ranges to those based on measurements confined entirely to natural habitats (seashores, mountains, nature reserves) can be puzzling and misleading when applied to plants common over much larger acreages in Britain in general but England in particular.

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UNUSUAL PLANT GROWTH

Being particularly interested in unusually tall plant specimens, I took special notice of the *Verbascum* sp. mentioned in *BSBI News* 80. From the photo it looks as if the plant is growing in a sheltered environment; an important factor in most extra tall specimens.

The following are taxa recorded locally over the last few years at maximum height:

| | |
|---|--------------------|
| <i>Carex laevigata</i> (Smooth-stalked Sedge) | 203.2 cm (80 ins) |
| <i>Cirsium palustre</i> (Marsh Thistle) | 210.8 cm (83 ins) |
| <i>Dactylis glomerata</i> (Cock's-foot) | 193.0 cm (76 ins) |
| <i>Juncus effusus</i> (Soft-rush) | 175.3 cm (69 ins) |
| <i>Luzula sylvatica</i> (Great Wood-rush) | 139.7 cm (55 ins) |
| <i>Oenothera biennis</i> (Common Evening-primrose) | 238.8 cm (94 ins) |
| <i>Rumex crispus</i> × <i>R. obtusifolius</i> (Meadow Dock) | 208.3 cm (82 ins) |
| <i>Rumex acetosa</i> (Common Sorrel) | 167.6 cm (66 ins) |
| <i>Sonchus asper</i> (Prickly Sow-thistle) | 322.6 cm (127 ins) |
| <i>Urtica dioica</i> (Common Nettle) | 266.7 cm (105 ins) |

In most instances the above taxa grew in shady, sheltered situations as well as having the natural support of hedges or other tall vegetation. It almost seems as if the energy saved in just staying upright is diverted into growing taller.

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BOTANY IN LITERATURE – 22

The following extract appears in P.G. Wodehouse, *Leave it to Psmith* (1923) ch. 6.

'If R. Psmith will meet the writer in the lobby of the Piccadilly Palace Hotel at twelve sharp, Friday, July 1, business may result if business meant and terms reasonable. R. Psmith will wear a pink chrysanthemum in his buttonhole . . .

'So you're R. Psmith?' said the young man . . . 'I asked you to wear a pink chrysanthemum. So I should recognise you, you know.'

'I am wearing a pink chrysanthemum. I should have imagined that that was a fact that the most casual observer could hardly have overlooked.'

'That thing?' The other gazed disparagingly at the floral decoration. 'I thought it was some kind of cabbage. I meant one of those little what-d'you-may-call-its that people wear in their button-holes.'

'Carnation, possibly?'

'Carnation! That's right.'

Psmith removed his chrysanthemum and dropped it behind the chair. He looked at his companion reproachfully.

'If you had studied botany at school, comrade,' he said, 'much misery might have been averted . . .'

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FERTILE HYBRIDS BETWEEN *VERONICA ANAGALLIS-AQUATICA* AND *V. CATENATA* (*V. × LACKSCHEWITZII*) IN YORKSHIRE

F₁ hybrids between *Veronica anagallis-aquatica* (Blue Water-speedwell) and *Veronica catenata* (Pink Water-speedwell) are common (Walters 1975) or are probably quite widespread but very overlooked (Preston and Croft 1997). Plants are most easily recognised by their complete sterility, the capsules never developing (Clapham, Tutin and Warburg 1962). As well as their capsules being undeveloped, their racemes are greater than five times the length of the subtending leaf.

Marchant (1970) produced hybrids artificially. He confirmed that all F₁ plants were apparently sterile but sterility was incomplete, as in F₂ and later generations some fertility occurred. Marchant also describes a topodeme near Barrington in Cambs. (v.c. 29), where the fertility of pollen varied from 3% to more than 99%. This observation demonstrates potential for fertility to occur in spontaneous hybrids.

Plants with a different combination of characters of the two species and intermediate characters, and having a varying degree of fertility, have been found by me in the following localities:

In dykes near East Cottingwith, GR SE/7.4 and near Harswell, GR SE/8.4; in a stream at North Newbald, GR SE/9.3 and in Foston Beck, GR TA/0.5, all in S.E. Yorks (v.c. 61) and in 1982; also, in the following year in Mid-W. Yorks (v.c. 64) in a drain at Addingham, GR SE/0.4 and in a stream below Kilnsey Crag Wharfedale, GR SD/9.6 where plants only 50 m apart exhibited a different combination of characters. The Addingham plants were notably vigorous, being c. 1.5 m in height.

As far as I know fertile hybrids have not been found in the 'wild' in the British Isles by any other botanist. Table I compares the characters of one of the Kilnsey specimens with that of the parents, using the parental characters listed by Marchant (1970).

Acknowledgements

I am indebted to Dr S.M. Walters for lending me his copy of Marchant's thesis and to the thesis for the lists of species' characters.

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DODDER ON BRAMBLE

In late summer 1998 I refound Dodder (*Cuscuta epithymum*) on Little Sark in the Channel Isles. The main hosts were Gorse (*Ulex* spp.) and Wood Sage (*Teucrium scorodonia*). However there was one small area where one or more bramble bushes (*Rubus fruticosus* agg.) had been parasitised.

Unlike the healthy-looking gorse and wood sage hosts, the bramble plants were much distorted wherever the haustoria were adherent, with fattened pallid contorted shoots, and stunted twisted thickened leaves. The bramble species was probably *R. ulmifolius*.

The dodder seemed to have used wood sage plants as the staging posts for its onslaughts on to the much bigger bramble shrubs; but the parasitised wood sage was flowering and seeding happily as an under-storey, whereas all the bramble flowering shoots were aborting.

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Table 1. Diagnostic characters of a putative *Veronica anagallis-aquatica* × *V. catenata* (*V.* × *lackschewitzii*) hybrid compared with listed characters for the parents.

| Structure | <i>Veronica anagallis-aquatica</i> | Putative <i>V.</i> × <i>lackschewitzii</i> | <i>Veronica catenata</i> |
|----------------------------|--|---|--|
| Leaves | Ovate or ovate-lanceolate ± amplexicaul | Lanceolate | Linear or linear-lanceolate |
| Racemes | Up to 3× the length of the subtending leaf. 40-60 flowers per 10 cm Some pedicels arising in groups, 2-5 | 1½× the length of the subtending leaf. 30-36 flowers per 10 cm Some pedicels arising in groups, some singly | Up to 5× the length of the subtending leaf 10-36 flowers per 10 cm Pedicels arising singly |
| Petals | Blue, violet veins | Pinkish-lilac | Pink, red-veins |
| Sepals | Oval to lanceolate, acute | Some oblong, some lanceolate | Elliptical or oblong |
| Bracts | Less than or equal to length of flower stalks Linear | Length variable Linear-lanceolate | Greater than the length of the flower stalk Lanceolate |
| Capsule | Orbicular to longer than wide Scarcely notched | Wider than long Deeply notched | Usually wider than long Deeply notched |
| Pedicel at fruiting | Erect, at least distally | Many at 45°, some spreading | Spreading and straight |
| Sepals at fruiting | Erect | Variable, some spread out half way up length; some capsules well developed | Spreading to reflexed |

STUNG – AGAIN!

I am glad that my little note in STOP PRESS (*BSBI News* 80) has been enjoyed. However it has been assumed by some that the County Council was Dorset: it was not. The County concerned has done much for conservation since, so I omitted the name. Also the writer was not my father, but a friend of his.

Appropriately, I too found *Cardamine pratensis* (Cuckooflower) in my own lawn. Botanists will not be surprised to know that the common name PRATT (Norman) probably means someone who lived by a meadow!

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BROOMRAPES APPARENTLY WITHOUT HOSTS

Like Eva Crackles, I too have been bewildered by broomrapes appearing without their hosts (*BSBI News* 79: 53) and was pleased to find someone else interested in this phenomenon. I've seen the following in increasing order of bewilderment, all Knapweed Broomrape (*Orobanche elatior*), all on chalk subsoil.

- 1) Growing on Common Knapweed (*Centaurea nigra*). The British *Floras* only give Greater Knapweed (*C. scabiosa*) as the host, but *Flora Europaea* permits '*Centaurea* spp., other Compositae and *Thalictrum*' (Chater & Webb 1981).
- 2) Apparently on their own, or only with grass spp. within 100 cm in any direction.
- 3) Growing through tarmac in an established car park north of Salisbury, a large healthy clump of inflorescences together.

All books I've so far checked firmly state full (obligate) parasitism for *Orobanche*, with no mention of possible saprophytic behaviour. Maberley (1997) gives some detail on the process, with a surprise at the end. The *Orobanche* inflorescence forms as follows:

'. . . host and parasite tissues difficult to discern (discriminate between?) but parasite certainly has (its) own vessel-elements; from near junction, inflorescence arises as a bud and pushes above ground, (*even through tarmac*)!'

No. (2) above could be explained as the final emergence of the broomrape following death or above-ground disappearance of the host: but I cannot square (3) with parasitism. Maberley does not explain the anomaly.

References

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THE CHANGING FORTUNES OF BRITAIN'S RARE ARABLE PLANTS, 1962-1997

Arable farming accounts for a huge proportion of the land use in Britain. Arable land once held an extremely diverse flora but modern developments in crop protection and seed cleaning have left many of our arable plants seriously threatened (Smith, 1986). Once-common species such as *Ranunculus arvensis* (Corn Buttercup) or *Chrysanthemum segetum* (Corn Marigold) have declined across their whole range and are now largely confined to neglected corners of a few farms (Stewart, Pearman & Preston, 1994). Others, such as *Centaurea cyanus* (Cornflower) or *Agrostemma githago* (Corncockle) are on the brink of extinction in the UK (P. Wilson, pers. comm.).

In 1997, the Northmoor Trust, working with English Nature and the Rare Arable Flora Group embarked on a new project, assessing the changes in arable plant status and distribution over the last 25 years. In 1962, Dr Quentin Kay, studying at Oxford University, surveyed a series of 156 arable fields dotted throughout Oxfordshire, within a range of crop and soil types. Dr Kay collected data from a 50 m² quadrat in stubble or 10 m² in standing crops. We repeated his survey in 1997 on the 104 fields that had remained in arable production. We sampled five 10 m² quadrats, three on the crop margin and two in the tramlines, but mostly in the standing crop – practically no one leaves stubble for very long any more. We also undertook full-field searches for scarce plants.

We already knew that some modern agricultural problem weeds, such as *Alopecurus myosuroides* (Black-grass) or *Anisantha sterilis* (Barren Brome) had become much more widespread whilst others, such as *Spergula arvensis* (Corn Spurrey) or *Anthemis arvensis* (Corn Chamomile) had become very

rare. What was surprising, however, was the scale of some of the changes. We have included two tables, which give a small sample of our data – a full report will be available later in the year.

Species which have declined since 1962 (no. of fields in which each species occurred)

| Latin name | Common name | 1962 | 1997 |
|-------------------------------|--------------------------|------|------|
| <i>Anthemis arvensis</i> | Corn Chamomile | 6 | 0 |
| <i>Centaurea cyanus</i> | Cornflower | 2 | 0 |
| <i>Chrysanthemum segetum</i> | Corn Marigold | 5 | 4 |
| <i>Galeopsis angustifolia</i> | Red Hemp-nettle | 11 | 1 |
| <i>Legousia hybrida</i> | Venus's-looking-glass | 8 | 5 |
| <i>Silene noctiflora</i> | Night-flowering Catchfly | 21 | 4 |
| <i>Spergula arvensis</i> | Corn Spurrey | 5 | 0 |

Species which have increased or remained constant since 1962 (no. of fields in which each species occurred)

| Latin name | Common name | 1962 | 1997 |
|-------------------------------|-------------------------|------|------|
| <i>Alopecurus myosuroides</i> | Black-grass | 13 | 76 |
| <i>Anisantha sterilis</i> | Barren Brome | 0 | 77 |
| <i>Anisantha diandra</i> | Great Brome | 0 | 3 |
| <i>Avena fatua</i> | Wild-oat | 18 | 54 |
| <i>Cirsium arvense</i> | Creeping Thistle | 25 | 62 |
| <i>Elytrigia repens</i> | Common Couch | 42 | 67 |
| <i>Galium aparine</i> | Cleavers | 25 | 62 |
| <i>Geranium dissectum</i> | Cut-leaved Crane's-bill | 10 | 59 |
| <i>Kickxia spuria</i> | Round-leaved Fluellen | 18 | 18 |
| <i>Lactuca serriola</i> | Prickly Lettuce | 0 | 17 |
| <i>Papaver hybridum</i> | Rough Poppy | 2 | 12 |
| <i>Papaver rhoeas</i> | Common Poppy | 43 | 74 |
| <i>Scandix pecten-veneris</i> | Shepherd's-needle | 0 | 3 |

Most of the data reflect patterns that we had suspected – with plants such as *Galeopsis angustifolia* and *Silene noctiflora* disappearing from their former strongholds. We also noted that the plants that had fared well included not only well known weeds such as *Alopecurus myosuroides* but also some of the uncommon plants like *Kickxia spuria*, *Papaver hybridum* and, most surprisingly, *Scandix pecten-veneris*.

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JUNIPER

It was good to see the recent article in *Watsonia* about *Juniperus communis* (Common Juniper) in the Lake District National Park. It is important that this priority species within the Biodiversity Action Plan process gets due attention and corresponding action. However, there has been more research done in the north of England than the article implied.

There is more recent evidence from the Upper Teesdale Nature Reserve than that cited (Piggot, 1956). Results of work undertaken here over the *last* 30 years can be found in the *English Nature Research Report* No 152 (1995); *ENACT* 5(1), Spring (1997) and *Scottish Forestry* 52(3&4), (1998).

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ATRIPLEX LITTORALIS ON INLAND ROADSIDES

In about 1990 a few 'road-verge enthusiasts' began to turn their attentions to *Atriplex littoralis* (Grass-leaved Orache). A short article was written on the spread of this plant along inland roadsides (Bungard & Leach 1991), but a request for further records drew an almost complete blank. In January Chris Preston sent me an up-to-the-minute early draft of the *Atlas 2000* map for *A. littoralis*. From my own limited experience of the plant, it appeared that its inland distribution was being badly under-estimated. While East Anglian botanists had obviously been spotting it without much trouble at all – there were lots of records from Norfolk and Cambridgeshire – elsewhere records were very thin on the ground. Is everyone saving up their *A. littoralis* records until last? Or is it being overlooked?

Chris and I felt that, if the final *Atlas 2000* map was going to properly reflect the distribution of *A. littoralis* along inland roadsides, something needed to be done quickly to raise the plant's profile. We decided it was time to put roadside *A. littoralis* on the map (literally). My own records (buried amongst the scurvygrass . . .), plus a few others brought to my attention over the last five years or so, added about 40 'new' hectads to the *Atlas* draft – though admittedly some of these were from vice-counties for which *Atlas* records had still to be submitted. The accompanying map shows, to the best of our knowledge, the current distribution of *A. littoralis* in the British Isles.

Of course, the map is full of gaps, and we suspect there are people out there who can already fill in some of the more obvious ones. Why, for example, should it be so widespread inland in Norfolk, yet apparently missing from much of the road network of Suffolk and Essex? Why is it in Cambridgeshire but not Bedfordshire? Recorders, please note: occurrences appear to be very much restricted to eastern England. Away from Norfolk, most are along – or on roads connecting with the A1/A1(M). Even so, the rest of us should guard against complacency. As I was putting the finishing touches to the map, Ian Green and Paul Green told me they saw it last year alongside the M5 in Gloucestershire – which means it could soon be turning up elsewhere in south-west England.

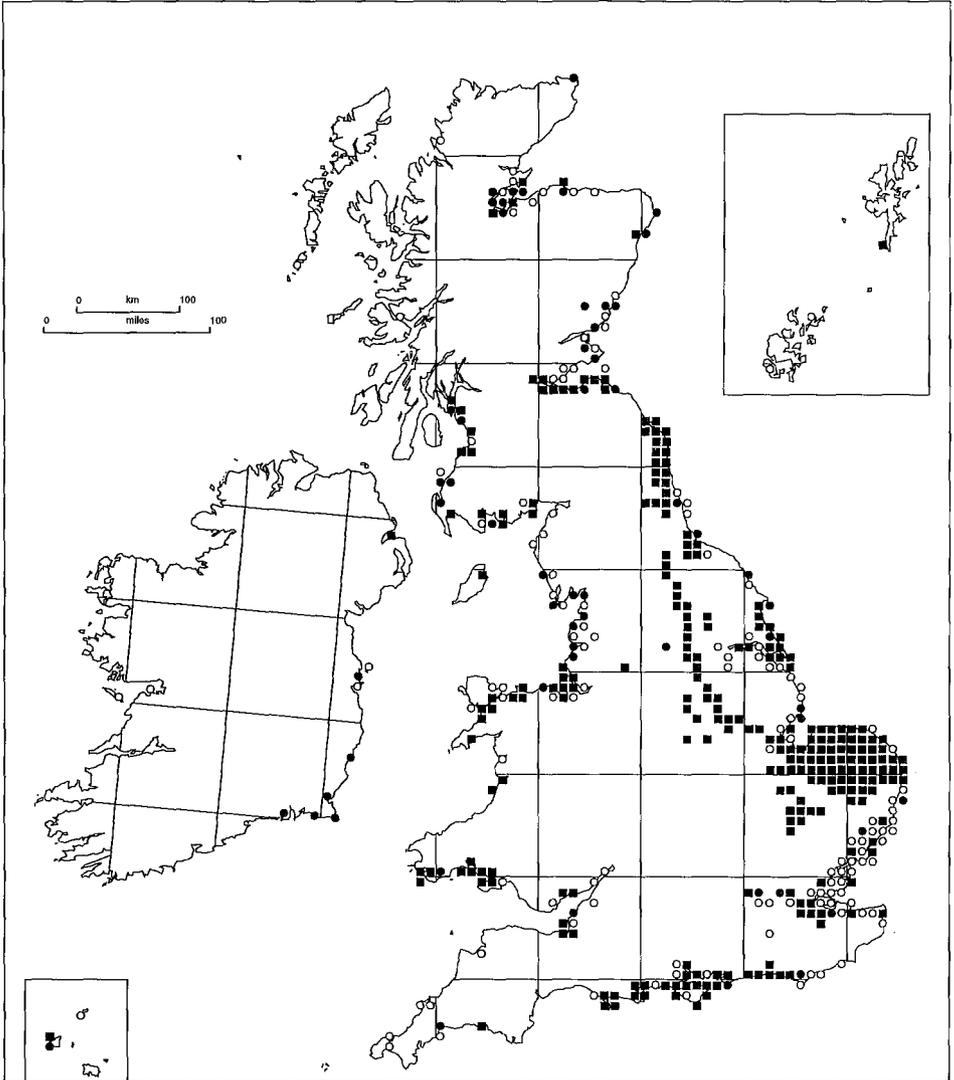
And if it's on the M5, then why not on the M4 and M3 in southern England, or the M42 and M6 in the west Midlands, or the M25 around London? The possibilities are endless . . .

Reference

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Atriplex littoralis



Atriplex littoralis

Solid square 1987+ records; Solid circle 1970-86 records; Open circle pre-1970 records

A QUESTION OF PRIORITIES?

QUESTION

How many botanists does it take to change a lightbulb?

ANSWER

Three.

One to decide whether *Lanterna domestica* Snooks (filia), in *Flowers of an Essex Girl*, Billericay August 1877, is synonymous with *Phos spitiacus* Ripyakorsetzev in *Journal des Hochelectrikesproblemen'* xxiv (3), Habsburg August 1877.

One to decide which (if either) of these names has priority.

One to do the actual work.

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CARDAMINE PRATENSIS IN URBAN LAWNS

Cardamine pratensis (Cuckooflower) grows prolifically in an old lawn at Bromborough, Wirral, where it is shaded, and also on an adjacent road verge in better light. Both are adjacent to a river valley with ancient woodland and a marshy floodplain. Some 5 years ago *C. pratensis* appeared in my back garden around an apple tree which is about 20 years old. It has now spread to the nearby plum (and been transplanted to my front garden 'wildflower grassland'). The areas beneath the trees have had bulbs since before we moved in (16 years ago) and so I have always left them untouched 'till June, then cut with a grass hook before resuming mowing with a cylinder mower. Cuttings are removed. We are on clay soil and both lawns are poorly drained. I cannot say whether the species arose from buried seed (the houses stand on the grounds of a Victorian mansion) or from that well known-means of transport, the botanist's boot!

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OUT-SIZE VERBASCUMS

I wonder whether Mr & Mrs Strachan's *Verbascum* was the same species as mine? (*BSBI News* 80: 30).

In 1996 while having an autumnal clear-up in the garden I came across a small rosette of unfamiliar leaves which I decided to leave undisturbed just to see what might develop. By early June 1997 the plant stood at 2.5 m and was growing rapidly, eventually attaining 4 m, by which time the lower seed capsules were reaching maturity. To avoid a future forest of giants I cut off the main spike which measured 2.1 m, leaving the laterals to develop. From time to time I cut off sections and counted the flowers. By the end of the season I estimated that the plant had produced no less than 10,000 blooms!

My v.c. Recorder confirmed my suspicions that the species was *Verbascum densiflorum* (Dense-flowered Mullein) – a new record for v.c. 12. At present there are two rosettes from self-sown seeds and I await development with interest!

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THE BLACK POPLAR SURVEY UPDATE

As so many members have helped me with fieldwork during 1997 and 1998, I thought that you may be interested in learning how the update of the Black Poplar Survey is progressing. You may recall that

Jane Croft (of Biological Records Centre at the Institute of Terrestrial Ecology), and I are in process of updating the national record, and in doing so, to expand information to include gender, pollard, standard and DNA profiling, where the latter is appropriate. Once recording is completed (if this is possible!), each tree will be allocated a unique number.

A number of areas I visited have been extensively surveyed by interested groups and individuals; North Wales by Les Starling of the Forestry Commission and Robert Lewis; Cheshire by members of the Cheshire Wildlife Trust; West Yorkshire by Kevin Pyne; Lancashire by Peter Jepson; Suffolk by Suffolk County Council; Herefordshire by Charles Watkins, Sonia Holland and Stephanie Thompson; Warwickshire by Steven Falk. Shropshire, Montgomeryshire and parts of Worcestershire were surveyed by the Environment Agency (including me) as part of their genetic study, trees around Aylesbury, covered by the Vale of Aylesbury Countryside Project have been diligently recorded and mapped. All these pieces of information have made my task considerably easier. I must stress that I have received many other records from counties I have yet to visit – please don't think I have forgotten you! My safari will commence again in May, probably with the Republic of Ireland.

On my travels, I have found a number of new trees, and sadly, a number of fallen trees, many as a result of the 1997 Christmas gales, but some of these are alive and will hopefully regenerate. As I cannot visit every individual tree I fear that losses may be even greater than those observed. May I remind members to let me know the sexes of unsexed trees and any new finds or losses they may see? The database at BRC can then be updated. However, it is not all bad news, numbers of trees listed would appear to put the national population at around 7,000, with perhaps 300-400 females. This increase in numbers since Edgar Milne-Redhead's survey is largely due to the Aylesbury population, which is approximately 2,500 individuals. I have also seen a few impostors that have found their way into the records – could I ask that if any uncertainty exists that a tree be omitted? Recording cards can be obtained from Jane Croft at BRC.

Lastly, I would like to express very grateful thanks to those people who have given their time and accompanied me on fieldwork over the past two years – Steven Falk, Ian Morgan, Trevor James, Peter Jepson, Charles Watkins, Marianne Le Ray, Peter Ennis, Kevin Pyne and of course, my long-suffering husband.

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[A cutting from *The Malvern Gazette & Ledbury Reporter*, sent by Ron Tavender, reports on efforts to conserve '... the finest collection of pollarded black poplars in the country.' The trees, on Castlemorton Common were pollarded, '... the traditional management practice similar to coppicing but carried out at 10 feet up the tree to stop animals eating the regrowth.' Editor]

READING THE POETRY OF THE LANDSCAPE

On the book page of the Weekend Supplement of the *Irish Times*, dated 20 February 1999, the editor introduces a lengthy section with the heading 'Eileen Battersby celebrates the "gentle wonder" of the work of Richard Mabey'.

Eileen Battersby is a regular feature writer on the staff of the *Irish Times*. Her article (not a review), entitled 'Reading the poetry of the landscape', is concerned with Selected Writings 1974-1999 (Richard Mabey, 1999).

Some extracts from the Battersby piece may be of interest to UK botanists:

'... though informed and concerned he [Richard Mabey] is never polemical, and has consistently maintained a relaxed, engaging, unegotistical style of writing which is accessible, vivid and understated'.

Regarding the county of Hertfordshire:

‘Mabey succeeds in showing that a landscape need not be unusual or unique to be interesting.’

Regarding the Burren:

‘The piece on the Burren is an atmospheric narrative which draws on visits separated by some fifteen years.’

MAURA SCANNELL, Raglan Road, Dublin 4.

RADIATION IN BRITISH APIACEAE I: COMPARING DIFFERENT SOURCES

Introduction

The forthcoming revision of the BSBI handbook *Umbellifers of the British Isles* (Tutin 1980) gives the opportunity for a new look at the phenomenon of radiation. Tutin's definition of this phenomenon is as follows:

‘The outer petals of flowers at the periphery of the umbel are sometimes much larger than the remainder, when they are said to be radiating’.

The definition itself requires clarification. For instance, what does ‘larger’ mean. Does it refer to length, to breadth, or to some combination of length and breadth? What account should be taken of curving or folding of petals when determining length? Does ‘remainder’ mean just the other petals in the same flower or all the other petals in the umbel? How much larger do the outer petals have to be in relation to each of the remaining petals? (The latter often differ in size between themselves). Does ‘periphery’ mean the periphery of the compound umbel which is characteristic of most British members of the family, or of the individual simple umbels of which they are composed? Since, in a number of species, the phenomenon is not restricted to peripheral flowers, should the term also be used for flowers placed more centrally?

I became particularly aware of these problems when devising a new key to simplify identification of Wiltshire umbellifers (Presland 1999a). I realised early, for instance, that Tutin's description of the outer petals of *Anthriscus sylvestris* (Cow Parsley) as ‘not radiating’ conflicted with my own observations, with close-up colour transparencies which I had taken and with illustrations in other sources (Hutchinson 1955; Ross-Craig 1958). Turning to Stace (1997), I found him describing the flowers as ‘actinomorphic’ (radially symmetrical), whereas radiating flowers are ‘zygomorphic’ (bilaterally symmetrical). Discrepancies were subsequently found for other species. Previous research appears not to have examined the question, and I therefore decided to look at it more systematically.

Methods

For the Tutin data, I used his categories of radiation: *strongly radiating*, *radiating*, *somewhat radiating*, *slightly radiating*, *scarcely radiating*, *not radiating or scarcely radiating* and *not radiating*. For each species where the means existed, I compared Tutin's category allocation with Ross-Craig's drawings and my slides. For each of these sources, I calculated:

- a **length ratio** by dividing the length of the outermost petal by the length of the shortest inner petal;
- a **breadth ratio** by dividing the breadth of the outermost petal by the breadth of the narrowest inner petal.
- an **added ratio** by adding together the length ratio and breadth ratio.

Length was deemed to be the distance from the edge of the stylopodium to the point on a radius going through the outermost point of the petal. **Breadth** was deemed to be the greatest breadth along a tangent to an imaginary circle with the centre of the stylopodium as its centre. Both length and breadth were measured purely on the basis of space occupied on a Ross-Craig page or on a slide, no adjustments being made for distortions due to the angle of view, curvature of a petal, reflexion of a petal at its apex, or concealment of a small part of the base of some petals by the stylopodium. The slides were projected on to a screen and the screen image measured. A more critical account of the methodology is contained in a fuller account elsewhere (Presland 1999b).

Table I: Species in six Tutin categories and their length, breadth and added ratios

| Tutin category | Length ratio (RC) | Length ratio (photo) | Breadth ratio (RC) | Breadth ratio (photo) | Added ratio (RC) | Added ratio (photo) |
|---|-------------------|----------------------|--------------------|-----------------------|------------------|---------------------|
| Strongly radiating | | | | | | |
| <i>Heracleum sphondylium</i> subsp. <i>sphondylium</i> | 2.4 | 3.2 | 3.4 | 2.5 | 5.8 | 5.7 |
| Radiating | | | | | | |
| <i>Tordylium maximum</i> | 1.9 | 2.6 | 1.8 | 1.7 | 3.7 | 4.3 |
| <i>Torilis arvensis</i> | 1.2 | 2.2 | 2.4 | 2.2 | 3.6 | 4.4 |
| Somewhat radiating | | | | | | |
| <i>Oenanthe fistulosa</i> | 2.3 | 4 | 1.9 | 1.3 | 4.2 | 5.3 |
| <i>Oenanthe pimpinelloides</i> | 2.1 | 2.25 | 1.9 | 2 | 4 | 4.25 |
| <i>Oenanthe silaifolia</i> | 2 | 2.6 | 1.6 | 1.9 | 3.6 | 4.5 |
| <i>Oenanthe lachenalii</i> | 1.5 | 1.4 | 1.25 | 1.6 | 2.75 | 3 |
| <i>Daucus carota</i> | 1.5 | 1.75 | 2.1 | 2.8 | 3.6 | 5.55 |
| Slightly radiating | | | | | | |
| <i>Myrrhis odorata</i> | 1.6 | 1.8 | 1.7 | 2 | 3.3 | 3.8 |
| <i>Aegopodium podagraria</i> | 1.4 | 1.3 | 1.1 | 1.3 | 2.5 | 2.6 |
| <i>Carum carvi</i> | 1 | 1.25 | 1 | 1.3 | 2 | 2.55 |
| Scarcely radiating | | | | | | |
| <i>Oenanthe crocata</i> | 1.5 | 1.5 | 1.4 | 1.3 | 2.9 | 2.8 |
| <i>Oenanthe fluviatilis</i> | 1.6 | 1.3 | 1.8 | 1.3 | 3.4 | 2.6 |
| <i>Oenanthe aquatica</i> | 1.6 | 1.5 | 1.6 | 1.5 | 3.2 | 3 |
| <i>Aethusa cynapium</i> | 1.4 | 1.6 | 1.5 | 2 | 2.9 | 3.6 |
| <i>Torilis japonica</i> | 1.1 | 1.4 | 1.6 | 1.2 | 2.7 | 2.6 |
| Not radiating or scarcely radiating | | | | | | |
| <i>Conopodium majus</i> | 1.4 | 1.25 | 1 | 1 | 3.3 | 2.25 |

Table II: Length, breadth and added ratios for species not radiating in Tutin but radiating in Ross-Craig and photographs

| | Length ratio (RC) | Length ratio (photo) | Breadth ratio (RC) | Breadth ratio (photo) | Added ratios (RC) | Added ratios (photo) |
|-------------------------------|-------------------|----------------------|--------------------|-----------------------|-------------------|----------------------|
| <i>Chaerophyllum temulum</i> | 1.5 | 1.25 | 1.4 | 1.6 | 2.9 | 2.85 |
| <i>Chaerophyllum aureum</i> | 1.4 | 1.3 | 1.1 | 1.3 | 2.5 | 2.6 |
| <i>Anthriscus sylvestris</i> | 2.5 | 2.3 | 2.2 | 2.6 | 4.7 | 4.9 |
| <i>Anthriscus caucalis</i> | 1.3 | 1.3 | 1.2 | 1.4 | 2.5 | 2.7 |
| <i>Scandix pecten-veneris</i> | 1.9 | 1.4 | 1.6 | 1.5 | 3.5 | 2.9 |
| <i>Pimpinella major</i> | 1.4 | 1.4 | 1.1 | 1.3 | 2.5 | 2.7 |
| <i>Meum athamanticum</i> | 1.4 | 1.3 | 1.25 | 1.25 | 2.65 | 2.55 |
| <i>Ligusticum scoticum</i> | 1.4 | 1.3 | 1.25 | 1.25 | 2.65 | 2.55 |

Results and analysis

The results of the above measurements were used to draw up Tables I and II. Table I sets out, for each of the Tutin categories except **not radiating**, the species included in it and, for each of these, the ratios calculated for the drawings (RC) and slides (photo). Table II lists species categorised as **not radiating** in Tutin which showed radiation clearly in both Ross-Craig's drawings and the photographs and sets out the same ratios as used in Table I.

The relevant **not radiating** species of Tutin which also showed no radiation in drawings or photos were *Hydrocotyle vulgaris* (Marsh Pennywort), *Physospermum cornubiense* (Bladderseed), *Conium maculatum* (Hemlock), *Smyrniium olusatrum* (Alexanders), *Apium graveolens* (Wild Celery), *A. nodiflorum* (Fool's-water-ress), *A. repens* (Creeping Marshwort), *A. inundatum* (Lesser Marshwort), *Cicuta virosa* (Cowbane), *Carum verticillatum* (Whorled Caraway), *Sison amomum* (Stone Parsley), *Stium latifolium* (Greater Water-parsnip), *Berula erecta* (Lesser Water-parsnip), *Seseli libanotis* (Moon Carrot), *Silaum silaus* (Pepper-saxifrage), *Angelica sylvestris* (Wild Angelica), *Angelica archangelica* (Garden Angelica), *Peucedanum ostruthium* (Masterwort), *Peucedanum palustre* (Milk-parsley), and *Torilis nodosa* (Knotted Hedge-parsley) (20 species).

To gain an objective picture of the extent of agreement and disagreement between both the different sources and the different measures, a correlation coefficient was calculated between each table column category and every other table column category, including all the species in both tables and the list. Spearman's Rank Correlation Coefficient was used, the species in each Tutin category being assigned a common tied ranking. The correlations between Tutin group and the ratio measures ranged from 0.72 to 0.81, while the correlations between all the ratio measures ranged from 0.90 to 0.99. These are all substantial correlations, indicating considerable levels of agreement between the different sources, and particularly between the drawings and the slides.

However, the disagreements are of most interest. The full range can be seen in the table, but some of the most striking of the findings for the drawings and slides are:

- *Anthriscus sylvestris*, **not radiating** in Tutin, is one of the strongest radiators of all.
- *Chaerophyllum temulum* (Rough Chervil) and *Scandix pecten-veneris* (Shepherd's-needle), **not radiating** in Tutin, show considerable degrees of radiation.
- *Oenanthe crocata* (Hemlock Water-dropwort), *O. fluviatilis* (River Water-dropwort), *O. aquatica* (Fine-leaved Water-dropwort), *Aethusa cynapium* (Fool's Parsley) and *Torilis japonica* (Upright Hedge-parsley), **scarcely radiating** in Tutin, show considerable degrees of radiation.
- *Myrrhis odorata* (Sweet Cicely), **slightly radiating** in Tutin, shows a strong degree of radiation.
- *Oenanthe fistulosa* (Tubular Water-dropwort), *O. pimpinelloides* (Corky-fruited Water-dropwort), *Oenanthe silaifolia* (Narrow-leaved Water-dropwort) and *Daucus carota* (Wild Carrot), **somewhat radiating** in Tutin, show strong degrees of radiation.

The fuller account draws attention to some cautions in interpreting these results. It is maintained only that the measurements are adequate for detecting large discrepancies and overall characteristics of the data, and it is important not to go beyond that.

Conclusions

What can be learned from these results? Firstly, since measures for length, breadth and length and bread combined agree so closely, whether obtained through the drawings or the photos, there are grounds for regarding radiation, at least in many species, as a unitary phenomenon, rather than occurring independently in relation to length or breadth. Secondly, since the measures from the drawings and the photos agree so closely, it seems likely that, for the most part, they are measuring the same thing. The Tutin classification, on the other hand, agrees less strongly with the other two sources, and probably refers to something different, though related. Could it be that it refers to a subjective impression of amount of radiation, rather than something based on measurement?

Perhaps the main conclusion has to be that we do not know very much about the phenomenon of radiation, particularly how much it might vary in British plants of the same species. The methods described here may be helpful for further study. This should be carried out on live material, since pressed specimens could have shrunken petals and/or the effective length could be altered during

pressing by flattening out of folds or curves. A study of my own, written up separately and to appear in a subsequent issue of *BSBI News*, applies the methods to *Anthriscus sylvestris*.

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MY WINTER ON MERCURY

As I write, it is February 28th, and there is still time for some cold weather. So far, though, London has experienced one of the mildest winters I can remember. On January 6th, the afternoon temperature actually touched 16°C, with most January days exceeding 10°C. Since autumn we have had no more than five or six nights of slight frost and only a single light snowfall.

Our urban flora has responded in various characteristic ways. New shoots on many native perennials have shown cautious precocity, while in some species last year's leafy stems have retained much of their freshness throughout the period. Many annual weeds, by contrast, have continued their vigorous growth and reproduction uninterrupted, as though October had simply stretched itself into five months.

One of the most successful adapters to these unusual conditions proved to be *Mercurialis annua* (Annual Mercury). Its claim to British native status is debatable (Stace 1997), showing, by my own judgement, ecological behaviours more typical of an introduction from warmer continental lands. It is a plentiful weed of sandy agricultural fields, but it becomes especially abundant in Greater London's more sheltered gardens and alleyways, by roadsides, along canal banks and around wastelands generally. Always it demands recent ground disturbance, and will, for example, readily luxuriate on new heaps of soil, organic refuse or rubble. It disappears rapidly as perennials take over.

As a member of our flora, it is a species of rather modest appearance. The male and female flowers, produced on separate individuals, are distinctive but do not exhibit any outstanding aesthetic attributes. Plants are often numerous but would not be regarded as pestilential. They are easy to identify and impose no taxonomic headaches. All of which may paint a relatively bland picture and account for the species not usually being given much press. It does, however, show fair degrees of morphological variation, from compact, rigid, narrowly lanceolate leaved specimens in nutrient-poor exposed places, to spreading, flexible, broadly ovate-lanceolate leaved specimens in nutrient-rich sheltered places. Light yellow-green to dark laurel-green leaf colours often correlate with the same habitat range. Also worthy of mention is that darker leaves often take on a curiously metallic bluish tinge when dried, as though first dyed in weak copper sulphate solution. I have noted a similar phenomenon also in *Mercurialis perennis* (Dog's Mercury) but in no other British plant. The stems show another unusual feature whereby each of the lower internodes expands more and more widely towards the next node below. This tends to give robust plants more basal support against wind-rock, by providing a geniculately sprawling tangle of heavier stems almost or quite touching the ground. Some *Persicaria* species (Redlegs) can inflate their lower internodes similarly when growing in precariously soft mud or shallow water.

Anyway, given this favourable season, I chose more closely to investigate the autecology of *M. annua* between December 1998 and February 1999, hence the above title. Four fascinating organisms immediately revealed evidence of their patronage upon it.

The first one refers back to those swollen nodes and internodes. Where these were misshapen and displaying small exit holes, they were found to contain frass-filled galleries vacated by matured adults of a small weevil, *Apion semiguttatum*. This insect is well documented in the literature (Dauphin & Aniotb  h  re 1993, Stubbs 1986), so would be a new record only for this part of London. The second one comprises numerous small crinkled leaf patches of the kind an Eriophyid mite could cause. However no such creature is described, so that item remains a puzzle.

More numerous still were the shot-holes. No, there is no misprint; this is a term well established in standard mycological literature, to indicate fungal leaf infections which begin as round grey or brown spots, soon go necrotic, and eventually drop out whole. The rest of the leaf remains healthy and functional, but it is thereafter perforated by one or more of these neat, circular punctures where the parasite had carried out its brief work. Many different plants are prone to attack by many different (often host-specific) fungi in this manner; they may appear unsightly but are normally not weakening to the plant overall. Some colonies of *M. annua*, however, were found to be peppered so liberally with such holes that they could almost serve as lace curtains. The fungus responsible for them is called *Cercospora mercurialis*.

Most exciting of all was the newly discovered rust fungus. Well, it is new in that I possess no book which quotes such a thing occurring on *M. annua* in this country, and Brian Spooner, mycologist at Kew, upon confirming its identity, mentioned only one previous observation of it in his own area. Clearly, however, it is widespread and plentiful on this host, and therefore presents a life history of some environmental importance.

Its name is *Melampsora populnea*. The spring (aecidial) stage produces vivid mustard yellow blisters which have long been known to contort the stems and petioles of *M. perennis* in old rural woodlands (Grove 1913, Ellis & Ellis 1997). The summer (uredinal) stage produces smaller bright orange pustules, often profusely, beneath the leaves of various native and planted Poplar trees throughout rural and urban areas alike. In towns, though, few if any habitats are suitable for *M. perennis*, which used to beg the question how did this abundant fungus *then* find host plants to accommodate its alternate stage. There may indeed be two answers. Obviously the present discovery of aecidia on *M. annua* is one. But the sheer quantity of uredinia seen each year on Poplars is so much greater that a dormant overwintering spore-bank probably also contributes.

Like so many rusts, it is strange to consider that two host plants, botanically so remote from each other, must serve, regularly and alternately, to sustain the survival of a single dependent fungus. One can but wonder how such odd relationships arose in the first instance. Probably the most famous example in history is that of *Puccinia graminis*, the formerly devastating Wheat Rust whose spring aecidia used to infect stems of *Berberis vulgaris* (Barberry) until that host was rigorously removed from the countryside. There are other rusts again which stick to the same host all year round, more than one spore stage sometimes simultaneously observable on the same leaf. In truth I find the subject compelling, particularly as the spores themselves become objects of exquisite beauty under the microscope.

As I complete writing, it is still mild. Crocuses and Daffodils are approaching their peak. It will soon be the Dandelion-naming season again – gosh, I should be so lucky?

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VERNACULAR NAMES – SOURCE OF CONFUSION

Having just obtained a copy of the *'Flowers of the Pacific Northwest'* I was struck by the different vernacular names used in the US compared to those used in the British Isles for the same species and, conversely, the same vernacular names for different species. Members may be interested in the following short list ('British' names in parentheses):

| | |
|---|---|
| <i>Listera cordata</i> | Heartleaved Twayblade (Lesser Twayblade) |
| <i>Montia (Claytonia) perfoliata</i> | Miners Lettuce (Springbeauty) |
| <i>Montia (Claytonia) sibirica</i> | Siberian Lettuce (Pink Purslane) |
| <i>Ranunculus uncinatus (parviflorus)</i> | Small-flowered Buttercup |
| <i>Anemone deltooides (nemorosa)</i> | Wood Anemone |
| <i>Tolmiea menziesii</i> | Youth on Age (Pick-a-back-plant) |
| <i>Cardamine pulcherrima (Lathraea squamaria)</i> | Toothwort |
| <i>Oxalis oregana (acetosella)</i> | Wood Sorrel (Wood-sorrel) |
| <i>Osmorhiza chilensis (Myrrhis odorata)</i> | Sweet Cicely |
| <i>Moneses uniflora</i> | Single Delight (One-flowered Wintergreen) |

Thank God for Latin names!!

By the way, *Lapsana communis* is Nipplewort in both camps, at least we agree on that.

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REDUCTIO AD ABSURDUM

I am sure that I am not alone, among botanists everywhere, in viewing with dismay the work of the Missouri Botanic Garden team on the DNA based phylogeny of flowering plants.

It would appear that much of what we have been taught, and used successfully over many years to identify and classify plants, is erroneous. Parameters which involve physical techniques of measurement and observation must be discarded in favour of DNA analysis, which the botanist working in the field can neither see nor measure.

However, do not despair! Help is at hand, and a team of dedicated field naturalists is at work on the development of a machine to end our troubles. The device is based on the simple tool, with which all of us are conversant, used to read off bar-codes of merchandise in shops and supermarkets.

All we need to do is scan the plant in question – no need for damaging sampling – and Hey! Presto!, a DNA profile which will enable us to be really accurate in our diagnosis.

Or have I got it wrong?

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SALIX PURPUREA SUBSP. *LAMBERTIANA* IN LANARKSHIRE (V.C. 77)

While recording along the Carmichael Burn, SE of Lanark, in September 1997 I was impressed by the diversity of willows and subsequently sent specimens to R.D. Meikle for identification. The taxa included *Salix pentandra* (Bay Willow), *S. caprea* (Goat Willow), *S. cinerea* subsp. *oleifolia* (Grey Willow) and the triple hybrid *S. × stipularis*.

However, one taxon was more difficult to identify and I was asked to submit further material in 1998. This was done in July and early September when Mr Meikle was able to make an identification of it as a plant which *Flora Europaea* lists as *Salix purpurea* subsp. *lambertiana* (Sm.) A. Neumann ex

Rechinger f. It was the first time that he had seen really convincing material of the subspecies which he now considers does deserve nomenclature recognition, though as a variety rather than a subspecies.

As compared with *S. purpurea* subsp. *purpurea* (Purple Willow) it has broader, oblong-ovate, distinctly serrate leaves (Fig 1). It was originally collected, about the beginning of the 19th century by A.B. Lambert on the banks of the River Wylde at Boyton Wiltshire (Meikle 1984).

Four trees of the taxon are present on the burn side at Carmichael. One has strong side shoots, the main trunk being dead while an adjacent tree has foliage from the main trunk although the upper half is dead. At approximately 366 m distance there are two strong healthy trees approximately 7.5 m high and 6.7 m in diameter.

Acknowledgement

I am grateful to Mr R.D. Meikle for the considerable trouble that he took in identifying this rarity.

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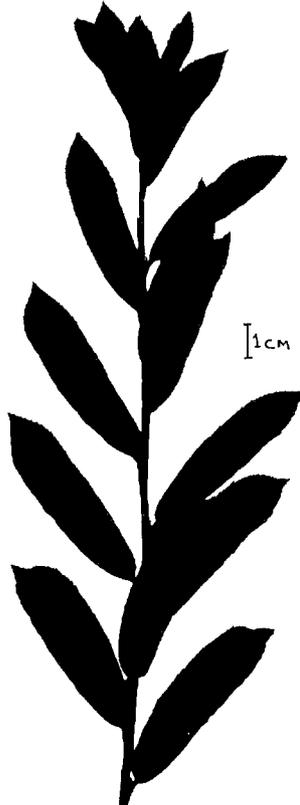


Fig 1. Photocopy of material of *Salix purpurea* subsp. *lambertiana* from the Carmichael Burn, Lanarkshire.

ASTER LINOSYRIS (GOLDBLOCKS ASTER) IN GOWER (V.C. 41)

The 1998 season seems to have been a particularly good one for *Aster linosyris* on the Gower coast. This had not gone unnoticed by local botanists and at my last visit some detailed survey work was obviously being undertaken at a well known site W of Port Eynon. Encouraged by the array of shoots bearing flowers or buds (300+) appearing through and around the low coastal gorse I had decided in late August to search the cliffs for other colonies, and between then and October made several visits. Plants are easily overlooked even when flowering well and almost impossible to see when not in flower.

A. linosyris is a plant of Western coastal limestone formations from South Devon to Morecambe Bay and has been known on the South Gower cliffs since the 1940s though the second of the eight known Gower sites was not discovered until 1974 (Wade, Kay and Ellis, *Flora of Glamorgan*, 1994). During the Autumn of 1998 I found five sites including the one mentioned above. The four sites new to me were all W of the original and all five occurred over a total distance of only 1.5 km. No site was found outside this length of cliff though the cliffs were searched from Port Eynon to Rhossili. Each population consisted of one or more fairly compact groups of shoots each group being within a c. 1-2 m diam., the two largest populations being contained within an area of no more than c.200 sq. m. Each population was on the lower slope of the cliff at about the same height above sea level c.25 m. The distance between adjacent populations was c.250-400 m, each being in a distinct cove separated from its neighbour by a rocky ridge.

It will be interesting to know if the five flowering colonies seen in 1998 are included in the eight recorded sites (perhaps more now). If one or more is additional to these it would indicate that further search in a good flowering year might reveal yet more colonies. If the smaller colonies turn out to be new it may suggest the plant is propagating in the area, or alternatively if they are not new and have become smaller, that it is declining.

Associated Species

Most of the species typically found on the short gorse heaths of the lower South Gower cliffs were often growing in, around or near the gorse bushes with which the *Aster linosyris* is constantly associated. Particularly close and frequent associates were:

Brachypodium sylvaticum (False Brome), *Calluna vulgaris* (Heather), *Carex flacca* (Glaucous Sedge), *Carlina vulgaris* (Carlina Thistle), *Euphorbia portlandica* (Portland Spurge), *Festuca* spp. (Fescues), *Geranium sanguineum* (Bloody Crane's-bill), *Helianthemum nummularium* (Common Rock-rose), *Leontodon saxatilis* (Lesser Hawkbit), *Prunella vulgaris* (Selfheal), *Rubia peregrina* (Wild Madder), *Sanguisorba minor* (Salad Burnet), *Teucrium scorodonia* (Wood Sage), *Viola hirta* (Hairy Violet) and *V. riviniana* (Common Dog-violet).

Dr Quentin Kay, in reply to a copy of the above note commented:

‘... I will send you the 6-figure grid refs. of the sites for which I have precise records. Personally, I think that it would be a good thing to publish the precise localities, including both your and our grid refs. (perhaps harmonised if we seem to have given different refs. for the same site) although BSBI may not agree. *A. linosyris* is a vigorous rhizomatous perennial that is unlikely to be affected by minor disturbance, and is well-protected by gorse and rock in its Gower sites – here at least, it is potentially threatened by ‘development’ but not by botanists.’

[It would be interesting to know whether members of BSBI agree with Dr Kay's thoughts about publishing precise details of the sites. I have decided to err on the side of caution, but I could be wrong!! Editor]

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FLORAUREA

Many common native plants have forms in which the traditional green colouring of leaves stems, etc., is either partially replaced or disguised beneath yellows or purples and reds. The case of yellows is, I believe, more interesting because it encompasses a wider range of possibilities. One explanation that has been offered is that stable yellow forms cannot produce chlorophyll b. However, this condition could either produce pale green or yellow forms and I have yet to come across examples where such aureates have been tested for their chlorophyll b content.

It seems a valid question to wonder what is the range of pigments that are involved in such forms and whether they can ever give the plant some advantage over the traditional green-leaved forms. Obviously there is a problem with scorching in sunlight for some forms but in others the ability to turn virtually green in the shade suggests that the yellow coloration may be an adaptation to brighter light, a metabolic control??

I am in the process of collecting, and growing, as many yellow-leaved forms of common native plants as I can legitimately acquire. I would like to make contact with others who have an interest in this subject and also make material available to people who might be able to test for the range and quantity of pigments.

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CONSERVATION NEWS & VIEWS

FENOR BOG, CO. WATERFORD TO BE CONSERVED

Fenor Bog is 13 ha of beautiful unspoilt fen located 5 km from Tramore in the village of Fenor, Co. Waterford. It is to be purchased and conserved by the Irish Peatland Conservation Council (IPCC) and the locally based group Móin Fhionnúrach Development Association (MFDA) in a joint project. 'The purchase of Fenor bog will help protect a habitat type that is fast disappearing in Ireland' said Dr Peter Foss Chairman of IPCC. 'Fenor Bog is one of only 13 peatlands remaining in Waterford,' he said.

This boggy fen is located in a valley overlooked by the gorse covered Ballyscanlan Hill. It contains a storehouse of natural variety – wet woodland dominated by willow, alder and birch trees; undulating greater tussock sedge vegetation; and flat wet wildflower areas. Over 90 species of plant, bird, animal and insect have been recorded on the fen. (Fenor bog can be viewed on the IPCC's website photograph album at <http://indigo.ie/~ipcc>)

The project will be a joint initiative between IPCC and MFDA. The main aim of the partnership is the conservation of the fen and its use for education, recreation and tourism. A feasibility study is to be carried out during the summer to assess the conservation value of the bog and advise on appropriate management options.

If you would like to help support the conservation of this site by making a donation please contact:

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ALIENS

FIDDLENECKS – HOW SCARCE?

In July 1992 I found a few plants of *Amsinckia* in coastal dunes at Aberlady nature reserve in Lothian, East Scotland. The yellow corollas were definitely less than 5 mm long, and according to Stace's *New Flora*, this suggested that I had found *Amsinckia micrantha* (Common Fiddleneck) – the only one of the two species recorded in UK to occur in Scotland. The other, *A. lycopsoides* (Scarce Fiddleneck) has larger corollas and with scales at apex of tube. These corollas were so tiny that I could not see into them, which seemed to suggest that I might have got it right.

In July 1997 I joined one of my husband's birdwatching groups on a visit to the Farne Islands in Northumberland. This, I had been told (although not very reliably), was the only place in UK where I could see *A. lycopsoides*. The *Flora of Northumberland* states that it was said to have been introduced by the lighthouse keeper on Inner Farne in chicken feed, and if this was so, must have arrived before 1912, the year in which the lighthouse became automatic.

When you arrive on Inner Farne you are greeted by nesting Arctic Terns which dive-bomb you with sharp beaks as you climb a boardwalk through their colony, a hundred metres or so to St Cuthbert's chapel. *Amsinckia* plants appeared almost as soon as the rocks began to acquire their thin covering of dark peaty soil. Both sides of the boardwalk were lined with plants, increasing in number as the buildings were reached, and here they covered a considerably large area around the chapel, National Trust shop and toilets. Their spread must be helped by the nesting activities of the birds which create disturbance and soil erosion, the latter, a current problem in the Farnes, as the number of nesting birds has increased.

The flowers of this very bristly *Amsinckia* were much brighter yellow, with corolla tubes 8 mm or more. I was so convinced that this was *A. lycopsoides* that I did not check further for pubescent scales in throats, etc. I chatted with one of the temporary wardens who was concerned about the spread of the plants and who till recently, had been led to believe, like me, that *A. lycopsoides* was confined in the UK to Inner Farne. Other visiting botanists had suggested to him that it was known elsewhere in the UK, and I wonder if anyone can confirm this? I would like to be able to let him know, when my husband returns again next July.

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FIDDLENECKS – HOW SCARCE? (2)

Sue Buckingham (SB) and Jim Bevan have both recently supplied me with much detailed information about *Amsinckia lycopsoides* (Scarce Fiddleneck) on Inner Farne (Cheviot, v.c. 68) and SB also invited me to add to her vivid personal account or to append my own critical comments separately. I have chosen the latter option. Since this locality appears to be the only place in the whole of Europe where this N. American native is firmly established, I feel that more details are worthy of print herein.

The Farne Islands lie off the Northumberland coast and comprise fifteen islands at high tide (28 at low tide) the nearest island being Inner Farne, 2.4 km offshore, only 2 ha in area, and sea level 0.5 km long. The top of the island is flattish with a gentle slope to the north-east: the highest point being the cliffs, some 21-25 m high. It is composed of hard quartz dolerite with a capping of glacial drift that has encouraged an organic peaty soil which is much enriched by guano due to the breeding seabirds. *Urtica dioica* (Common Nettle), *Silene uniflora* (Sea Campion), *Stellaria media* (Common Chickweed) and *Holcus lanatus* (Yorkshire-fog) intermix with the *Amsinckia*; *Rumex obtusifolius* (Broad-leaved Dock), *Festuca rubra* (Red Fescue), *Cirsium vulgare* (Spear Thistle), *Cirsium arvense* (Creeping Thistle), *Senecio jacobaea* (Common Ragwort), *Conium maculatum* (Hemlock), *Atriplex glabriuscula*

(Babington's Orache) and *Sonchus asper* (Prickly Sow-thistle) add to the ground cover species. See the excellent cover illustration by G.M.S. Easy based on a photograph by SB. Mostly these are common species that enjoy nitrogen-rich soil, with no 'demanding' qualities. M.J.D. Hirons in 'The Flora of the Farne Islands', *Trans. nat. Hist. Soc. Northumb.* 57: 69-114 (1994) gives much fuller details (the cover says vol. 56, but presumably in error).

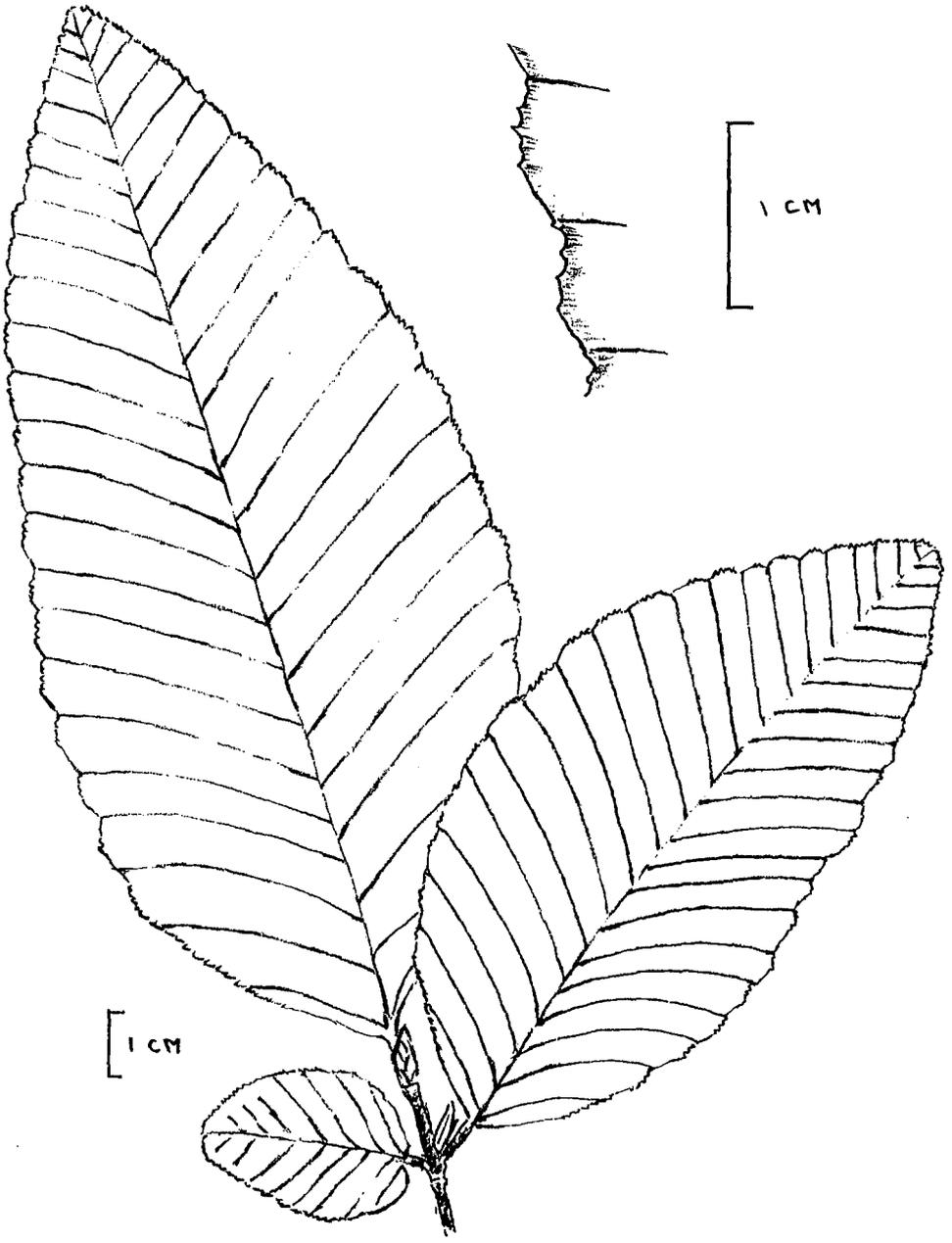
It is remarkable that the species has apparently never been recorded, even as a casual, on any of the other islands or on the adjacent mainland over the last 90 or so years. I strongly believe that its arrival here was pre-1912: chicken runs were once a typical place to see *Amsinckia* species: see, e.g., J.F. Rayner (1925) amongst his list of alien plants in v.cc. 10 & 11 published in *Proc. Isle of Wight Nat. Hist. Soc.* 1: 258. (Alas, the modern *Flora of Hampshire* (1996) appears to expunge all *Amsinckia* records!). Exclusion of dogs from Inner Farne may have been one major factor helping to prevent any spread. On the nearby Holy Island (v.c. 68) the Australasian alien *Acaena novae-zelandiae* (Pirri-pirri-bur) has had an explosive expansion (on the mainland, too) and 'dogs return with their tails and undersides full of the spiny horrors (fruits)', whereas 'young larks and lapwings (have been seen) covered with the burrs and crippled', quoting J.E. Lousley, in *Country Life*, 15 March 1956.

I should state that, as late as June 1980, when M.A. Hyde visited the Inner Farne, the plant was incorrectly labelled on the nature trail as *A. intermedia*. He told me that 'the hairy processes in the corolla throat were clearly visible. It certainly looks different to our E. Anglian one (*A. micrantha*) – but not very different!' Blamey & Grey-Wilson (1989) confuse the story yet further in their *Illustrated flora of Britain and northern Europe* and make several other errors. Genuine *A. micrantha* is known from mainland v.c. 68, but has never appeared on the islands – their *A. lycopodioides* is a misprint for *A. lycopsoides*, the accompanying painting is not of an *Amsinckia* sp. at all – none has leaves with prominent secondary veins as they depict (indeed picking out any lateral vein is a sore test of the eyesight – the illustration of *A. micrantha* on the cover of *BSBI News* 9 (1975) shows none!), and the corolla shape shown in their enlargements is quite wrong. They also show a long style much exceeding the calyx: I believe *all* the Farne plants have a style not exceeding a mid-calyx position adjacent to the anthers: who can check this for me and who can identify their painting? In all current literature this species is said to be *not* heterostylous – but pin- and thrum-eyed morphs do occur amongst some of the non-weedy N. American *Amsinckia* species. Hirons (1994, p. 101) implies that *A. lycopsoides* is a native of Mexico (Baja California) – *A. intermedia* does extend this far south – but *A. lycopsoides* does not occur there even as an alien, its home being from ?N. California up to British Columbia. Although it is now 'common' in California, older books, like W.L. Jepson's (1943), *A Flora of California* 3(2): 318-327 do not mention this species, nor give any description that is convincingly this taxon: it has clearly extended its range there – but has not done so in the British Isles. Who can explain this? – its requirements are relatively undemanding.

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IS THIS *NOTHOFAGUS ALPINA*?

Several species of *Nothofagus* (Southern Beeches) are increasingly being planted in wild places in Britain, sometimes as a replacement for dead elm trees. The Rev. E.A. Pratt (EAP) found such a colony in October 1998 at Swanage v.c. 9 (Dorset), hectad SZ/0.8. The leaves were consistently huge (for this genus), many measuring to c. 20 cm long, and 9 cm broad, with 20-25 pairs of secondary veins. They were essentially glabrous above but sparsely hairy below (mostly on the veins). The winter buds were 9-11 mm long. Ted Pratt has skilfully provided the illustration herewith, and a voucher specimen is now preserved in **Herb. EJC**. Using Stace's *New Flora of the British Isles*, ed.2: 120 (1997) this matches the description of *N. nervosa* (Phil.) Krasser (Rauli) except that the leaves are described as being only



Nothofagus nervosa. Terminal shoot and enlargement of leaf margin. Del. E.A. Pratt © 1998

4-8 cm long: I am however confident that this is merely a large-leaved variant of this variable species. One very unusual feature is clearly shown by EAP (see enlargement of leaf margin): the secondary veins of the leaves all run out towards a sinus (and not a tooth), a characteristic that must surely be rare – I cannot recall any other species that is similar!

A more clever and alternative determination would have been *N. alpina* (Poepp. & Endl.) Krasser – and I have three chances of being correct, since, currently, this name is regrettably applied to three different taxa, according to which source one follows. Here the author citation is useless: only quotation of a secondary work reveals the precise taxon intended. A world-wide list of plant names that we *all* follow is one obvious solution; meanwhile we must choose between the options:

- Ref. 1. $N. \times alpina = N. nervosa \times N. obliqua$
 [Govaerts & Frodin, *World checklist and bibliography of Fagales*, p.193. Kew, 1998].
- Ref. 2. $N. \times alpina = N. nervosa \times N. pumilio$
 [Griffiths, *RHS Index of garden plants*, p. 787. Macmillan Press, 1994]
- Ref.3. $N. alpina = N. procera$
 [Cullen & Maxwell, in *European Garden Flora* 3: 63. Cambridge Univ. Press, 1989]

One naturally hopes and expects the latest works to be correct, and one would tend to follow either ref. 1 or ref. 2 (all new works contain some errors!). Yet, personally, I have most faith in ref. 3. I hope that Europeans will eventually fall into agreement with all S. American works (the native home of this taxon) that insist that *N. alpina* is the earlier and correct name for what we call *N. nervosa* (= *N. procera*) and have consistently used it since 1959 (Muñoz Pizarro, *Sinopsis de la flora Chilena*). N. American works certainly are in agreement.

R. Govaerts & D.G. Frodin's work (ref. 1) is a fascinating source of information although the contents (407 pp) may not be clear to everyone – Fagales is used to cover the four families Betulaceae, Corylaceae, Fagaceae and Tricodendraceae – but it is very difficult for a novice (like me!) to understand the database symbology given for each species. It took me some time to fathom out that, for example:

N. nervosa (10) grb (11) ger 85 CLC CLS. Phan.

means that this species is:

Naturalised in N. Europe (Great Britain) and Middle Europe (Germany) and is native in Southern S. America (C. & S. Chile), and it is a very large shrub or a tree (= a phanerophyte).

The abbreviations are *only* fully explained in an obscure publication by Hollis & Brumitt (1992), *World geographical scheme for recording plant distributions*, published in Pittsburgh (USA), which is in few libraries and even then fails to list CLC (obviously, C Chile). This is not user-friendly. Incidentally, I fail to understand why the distribution does not include AGS (South Argentina – not the Alpine Garden Society!) for this species, since Bean (*loc. cit.*) tells of its occurrence in the Neuquén province and this locality is repeated in *Flora Patagonia* 4A: 7 (1984), admittedly under the dreaded multipurpose name of *N. alpina*. I suspect an error of omission.

Govaerts and Frodin (1998) also present very helpful and virtually exhaustive synonymy for all species, but readers should be alerted to the fact that some of their synonyms appear to have been unchecked in modern times: they are extracted from the original *Index Kewensis* (I.K.) volumes and *Supplements* 1-3 (1895-1908) and a few are clearly incorrect. Clive Stace (1989) warns us in *Plant taxonomy and biosystematics*, 2nd. ed. (p. 204) that 'many errors were introduced' in I.K. by this means, which was wisely abandoned in *Supplement* 4.

I might add that I often find *Nothofagus* taxa difficult to name as some of the species appear to be surprisingly variable, allowing the opportunity to claim hybrids when this is not so. Stace (1997) claims that $N. nervosa \times N. obliqua$ is endemic to Britain, but I can trace no record of its wild localities: who can help me to locate them?

In *Field flora of the British Isles*, p. 87 (1999), Clive Stace accepts *N. alpina* as the correct name for *N. nervosa*!

INULA HOOKERI C.B. CLARKE: ESTABLISHED IN BRITAIN

In August 1996 one of us (PM) discovered an unknown yellow-flowered composite growing west of Milncroft, Lanarkshire (v.c. 77), grid reference NS/74.71. The site was an old sand quarry in which excavation was discontinued over 25 years ago and the area partly infilled with rubble and largely flattened out. The plant grew in a large patch, measuring 1.5×1 m, together with nine satellite clumps on the slope of a little knoll, approximately 185 m from a public road and was accompanied by two other garden escapes, *Lysimachia punctata* (Dotted Loosestrife) and *Geranium* × *oxonianum* (Druce's Crane's-bill), presumably all the result of fly-tipping. Close native associates were *Angelica sylvestris* (Wild Angelica), *Anthriscus sylvestris* (Cow Parsley), *Calluna vulgaris* (Heather), *Dactylis glomerata* (Cock's-foot), *Dactylorhiza fuchsii* (Common Spotted-orchid), *Deschampsia cespitosa* (Tufted Hair-grass), *Equisetum arvense* (Field Horsetail), *E. palustre* (Marsh Horsetail), *Galium palustre* (Common Marsh-bedstraw), *Prunella vulgaris* (Selfheal), *Ranunculus flammula* (Lesser Spearwort) and *Typha latifolia* (Bulrush). Some shade was provided by *Betula pendula* (Silver Birch) and *Salix* spp.

Although the plant is a rhizomatous perennial its spread is relatively slow, but it has obviously been well established at Milncroft for some time. A local dog-walker has known the colony for at least five years.

A specimen was collected (now in **Herb. P.M.**) and sent to EJC for determination. Unfortunately the plant is one of three or more similar species much confused in the literature. The closest match and the name in vogue in current gardening catalogues is *Inula hookeri*, originating from the Himalayas. We can trace no name in English. By chance, EJC already had the species in cultivation (from an unknown horticultural source) and this enabled Delf Smith to produce for us the splendid accompanying illustration (see page 54).

A description can be found in *The New Royal Horticultural Society Dictionary of Gardening* 2: 660 (1992), together with a key to the species. In Stace's *New Flora of the British Isles*, 2nd ed. (1997), it fails to key out at dichotomy 3 to any species of *Inula* because of its combination of lanceolate outer phyllaries and capitula >5 cm across (incl. ligules).

The first published record for this species in the British Isles appears to be in *A Flora of Cumbria* (G. Halliday 1997). In addition Mrs E. Norman (personal communication) saw it very well established in 1986 on a roadside at Kilnsey (MW Yorks., v.c. 64).

Undoubtedly it occurs in other British localities, probably always the result of discarded rhizomes, since spontaneous seedlings apparently do not occur, even in gardens.

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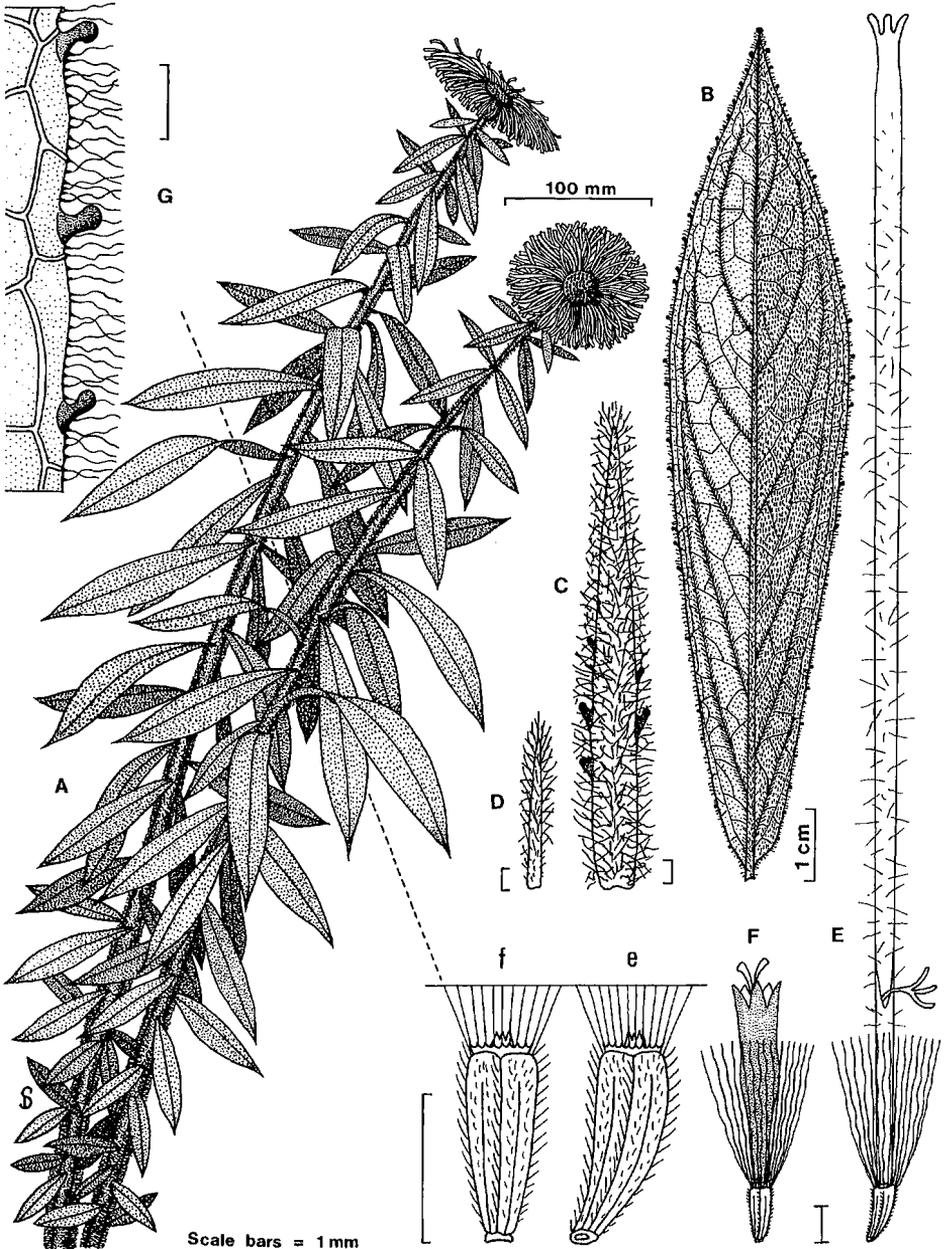
NEW CONIFER IN THE BRITISH ISLES?

I am not sure that my friend Humphrey Bowen (*BSBI News* 80) has correctly identified this new conifer: it is I think *Pseudopinus mobiletelephonyensis* (Ring) Ring. *P. telephonyensis* (G. Bell) Ring is a long established introduction, now on the decline. In my youth the variety found along railway lines (and elsewhere) was a prolific cone-bearer: indeed the cones remained on the branches for as long as *Pinus radiata*.

Nowadays it seems less fertile, and that despite its rhizomes having become thicker. Strangely it was not mapped in the 1962 *Atlas*, nor does Clive Stace mention it . . . !

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Has any member got a photograph of this beast? I have received several newspaper cuttings with photos and would very much like to include one in a future issue of *News*. Ed.



Imula hookeri C.B. Clarke del. D.P.J. Smith © 1998

A. Habit; B. Middle stem leaf; C. Outer phyllary; D. Inner phyllary; E. Outer ray floret and achene; e. Enlargement of ray floret achene; F. Disc floret and achene; f. Enlargement of disc florét achene (dotted line shows length of pappus hairs); G. Leaf margin showing cilia and glands.

NOTES ON THE IDENTIFICATION OF PLANTED POPLARS

Since the publication of Stace's *New Flora* it has become somewhat easier for the non-specialist to identify the planted poplars in the countryside, but many difficulties remain. There is no complete set of good descriptions and illustrations of the various species, hybrids and cultivars, and I am not aware of any really comprehensive living collection where one can go to learn them (although the National Populetum at the Forestry Commission, Alice Holt, near Farnham in Surrey, is well worth a visit). While learning the taxa, it is often necessary to see the trees at three or four different times of year in order to assemble the characters needed to identify them. Worst of all, the BSBI has currently no referee. I am no expert, and because of the multiplicity of characters required for identification I am not prepared to name material, but a couple of years' effort enabled me to become reasonably confident at identifying most of the poplars in my own county of Cardiganshire, v.c. 46, and it has been suggested that it might be helpful if I passed on a few hints about how to get started, especially with the cultivars. The following notes are intended to be used in conjunction with Stace (1997) and Jobling (1990).

Literature

Stace ed. 2 (1997) is significantly more useful, and contains several more taxa, than ed. 1 (1991), but it covers rather few characters, and also does not enable one to distinguish several cultivars that are now widely planted such as 'Beaupré', 'Trichobel' and 'Columbia River' (I have not come across anything that does). Jobling (1990), with a key, partial descriptions and much other information, is essential; it is an updating and expansion of Peace (1952) which remains useful as it gives a picture of what was being planted at this earlier date. (The even earlier Anon. (1923) has a similar interest but is much less useful for identification.) Most of the standard tree books are worth consulting, including Elwes & Henry (1913), Mitchell (1974) and Bean (1976); Meikle (1984) has much useful information. George Hutchinson, to whom I am grateful for helpful comments, has an article in press on the Carmarthenshire taxa.

Taxonomy and status

Our wild, planted and naturalised poplars are an often bewildering mixture of species, subspecies, hybrids and cultivars (or varieties, according to taste). Even the taxonomy of the now familiar Black-poplar, *Populus nigra*, is poorly understood. While our native trees are usually taken to be subsp. *betulifolia*, little is known about subsp. *nigra*; there are few or no trees of it recognised in cultivation or in the wild in Britain, and yet some of our native trees and many planted ones seem to have its characters. The 'Manchester Poplar' is often mentioned, but I have never been able to find what its characters are and it seems to be just a name for planted Black-poplars (especially around Manchester!). The whole group of Balsam-poplars is especially difficult, and I have fortunately had few of them to deal with in v.c. 46. Most of the commonly planted cultivars are clones or groups of clones, derived from various species or hybrids, and are unisexual. They do not reproduce by seed and are likely to be recorded for Atlas 2000 purposes only as 'planted', except perhaps for the few that sucker. Gilbert (1993) discusses the only known populations of hybrids naturally regenerating by seed.

Sex

Both for cultivars and for several other taxa it is essential to discover the sex of the tree. This can most easily be done from late February to early April when the catkins are out (a month or two before the leaves). But it can also be discovered any time from late summer onwards by dissecting the catkin-buds; these are the conspicuously larger buds just back from the apex of the twigs, in which the vestigial stamens or pistils can easily be seen with a lens.

Time of leafing and colour of young leaves

Most of the taxa come into leaf in a regular sequence, and the colour of the young leaves as they emerge and for their first week or two is of importance for identification. Thus when one has got a name for a tree that, say, comes into bronze-coloured leaf in the third week of April, others that are at the same stage and colour at this same time in spring are likely to be the same taxon. The sequence of

leafing of some of the commoner taxa (based largely on Jobling, 1990) is: *P. × jackii* (*candicans*), *P. 'Balsam Spire'*, *P. trichocarpa*, *P. 'Heidemij'*, *P. 'Robusta'*, *P. 'Italica'*, *P. 'Plantierensis'*, *P. '178'*, *P. marilandica*, *P. 'Eugenii'*, *P. 'Regenerata'*, *P. nigra* subsp. *betulifolia*, *P. 'Gigantea'*, *P. 'Gelrica'*, *P. 'Serotina'*. In my own area, any poplar still in bud in early May is virtually certain to be *P. 'Serotina'*. *P. 'Heidemij'*, morphologically separable from *P. 'Robusta'* only by the absence of minute hairs on the twigs, is immediately distinguishable for a week or two in April as its bronze-coloured young leaves come out a few days to a week earlier, and its leaves have turned green while those of *P. 'Robusta'* are still bronze. Beware that the repulsive *P. × jackii* 'Aurora' starts off green and almost indistinguishable from normal *P. × jackii*, the garish variegation developing only in the summer leaves.

Leaf-shape

This must be assessed on mature leaves on short shoots or on the lower parts of long shoots. Leaves on the often more accessible epicormic shoots and suckers, and those at the apex of the long shoots, are often very different. Fallen leaves can of course often be used until well into the winter.

Pubescence

Assessing the pubescence of twigs can be difficult. Taxa such as *P. 'Plantierensis'* and *P. 'Robusta'*, for which pubescent twigs are diagnostic, can have many twigs glabrous and very careful investigation, concentrating on areas of bark protected by buds, is often necessary. I get the impression that, rather improbably, the pubescence on a twig sometimes develops comparatively late in the season after the twig has elongated. Pubescence of the petioles can also be useful, and for example *P. × jackii* has conspicuous, comparatively long hairs 0.3–0.5 mm, *P. trichocarpa* has minute uniform hairs c.0.05 mm, while *P. 'Balsam Spire'* has a mixture of hairs c.0.1 and c.0.05 mm.

Shape of tree

The angle and nature of branching and the overall shape of the tree are fairly constant for each taxon and can be diagnostic. They are best seen in winter, when it is useful to take photographs to supplement the spring and summer characters. Among the common cultivars, some like *P. 'Eugenii'*, *P. '178'* and to some extent *P. 'Gelrica'* seem to have the trunk continuing straight to the very apex of the tree, while others like *P. 'Robusta'*, *P. 'Heidemij'*, *P. 'Regenerata'*, *P. 'Marilandica'*, *P. 'Serotina'* and *P. 'Balsam Spire'* have the straight line of the trunk getting lost in the upper branches. Disease sometimes greatly distorts the shape of a tree, and canker-prone clones of *P. 'Eugenii'* and *P. 'Regenerata'* planted in the 1950s often survive as characteristically misshapen trees like those shown in Plate 47 in Peace (1952).

Other characters

The nature of the bark and various catkin characters such as colour and number of anthers are sometimes useful and worth recording. Twigs may be terete, ribbed or angled, though these characters may become distorted on drying.

Lombardy-poplars

In v.c. 46 all the narrowly fastigiate male trees turn out to be *P. 'Plantierensis'*, and I have yet to find *P. 'Italica'* even in a garden. Somewhat broader trees are mostly the glabrous female cultivar *P. 'Gigantea'*. In the north of the county there are several female trees with strongly pubescent twigs, in shape like a slightly more open *P. 'Gigantea'*, yet too fastigiate to be *P. nigra* subsp. *betulifolia*; their identity remains uncertain.

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NOTICES. (BSBI)

FRIDAY 20th to MONDAY 23rd AUGUST 1999
WELSH ANNUAL GENERAL MEETING
and
ATTENDANT FIELD MEETINGS
TRINITY COLLEGE, CARMARTHEN (v.cc. 44 & 45) [37]
Leaders: S B Evans and R D Pryce

The Welsh AGM and Exhibition Meeting will be held on Saturday 21st August and will be followed by illustrated talks on the floras of both Carmarthenshire and Pembrokeshire given by the leaders.

Participants will be divided into manageable groups for the attendant field meetings on the Friday evening, Saturday morning and Sunday. They will be conducted by knowledgeable local leaders but there will also be the opportunity for 'square bashing'. Recording and monitoring will be carried out at sites in west Carmarthenshire and east Pembrokeshire and will seek to demonstrate the diversity of both vice-counties whilst also providing valuable data for Atlas 2000 and the local flora recording projects.

Accommodation will be available in the college halls of residence, in single or double rooms, at approximately £35.00 per day (bed, breakfast and evening meal, *en suite*) and £25.00 per day (bed, breakfast and evening meal, standard) per person. Packed lunch £5.00 extra per day.

Booking forms are available from Dr David Humphreys, Knill Court, Knill, Nr. Presteigne, Powys, LD8 2PR.

EDITOR

THE YOUNG BOTANIST

A special newsletter for our young members and any others who are interested

The first edition of *The Young Botanist* is distributed to members with this mailing. As the new Youth Officer for the Society it is my job to provide for our young members and to encourage any other children who would want to, to join. When I, myself, was a botanical child, I felt very much alone, the only one of my kind ('Nature Parliament' on the wireless was a considerable help, but even those

splendid people tended to concentrate on mammals, birds and insects; there was no television); how very much I wish I had known about the BSBI then! In order that interested children of today might be reached I am asking members if they would pass this first *Young Botanist* on to anyone who might be interested – children, parents, teachers and so on; photocopying will be allowable for non-commercial purposes.

I should be most pleased to receive comments and suggestions.

AILSAS BURNS, 3 Rosliston Road, Stapenhill, Burton upon Trent, Staffs. DE15 9RJ

JOHN DONY / VICTOR CHAMBERS MEMORIAL MEETING SUNDAY 8th AUGUST FLITWICK MOOR, BEDFORDSHIRE (v.c. 30)

Leaders: Mr Alan R. Outen & Mr Chris R. Boon

John Dony would have been one hundred on 8th August this year. In the obituary he wrote for the eminent entomologist Dr Vic Chambers in 1984 John concluded:

‘The passing of Vic to me will mean that we cannot now honour our long-standing agreement to walk across Flitwick Moor together on my hundredth birthday. It will be a visit I must make alone, carrying with me the memories of one of the most extraordinary sons of Bedfordshire’.

It seems a fitting way to remember these two great Bedfordshire naturalists if those friends who are able would like to join us in a Botanical and general natural history meeting at this site, (one of our finest and most important Nature Reserves) as John had intended to do on what would have been his one hundredth birthday.

Meet at 10.30 a.m. at TL/042.355 on the minor road between the A507 and Flitwick near the entrance to Folly Farm and the Nature Reserve. Wellingtons are strongly advised! This is a joint meeting open to members of the Botanical Society of the British Isles and the Bedfordshire Natural History Society together with any other friends of either of these two eminent naturalists. It would therefore be useful to have some idea of numbers prior to the meeting. Please send bookings to:

ALAN R. OUTEN, 15 Manor Close, Clifton Shefford, Beds. SG17 5EJ

NOTICES (NON BSBI)

HERBARIUM TECHNIQUES COURSE

The University of Birmingham is running a course on Herbarium Techniques and Management as a series of three Saturdays. This course is aimed at botanists who wish to improve their own herbarium skills and also for national collection holders. The tutor is Dr Richard Lester, curator of the University of Birmingham Herbarium. The cost is £50 for three Saturdays and the course is being run twice this year, in May and again in October.

If you would like more details, please ring Pam Smith, Director of the Botanic Gardens, School of Continuing Studies, 58 Edgbaston Park Road, Birmingham B15 2TT Tel: 0121 414 4944.

SARAH WHILD, BSBI Co-ordinator

RETURN OF THE NATIVE *FLORA CELTICA - SCOTLAND 2000*

The Royal Botanic Garden Edinburgh's *Flora Celtica - Scotland 2000* project has been awarded a grant by the Heritage Lottery Fund as part of the Scottish Millennium Festival Fund.

This is an innovative project that will present a new vision of the importance of native plants in Scotland as we enter the next Millennium. The project's main aim is to promote public awareness of a disappearing part of our Scottish cultural heritage: the tradition of using native plants.

Historically, Scots have been adept at utilising natural resources in ingenious ways, from finding a means of keeping a long-lasting head on a pint of beer to providing a cure for impotence. Native plants have more uses than we might imagine! With a plea to the public, *Flora Celtica - Scotland 2000* hopes to encourage their active involvement in the research programme, allowing them to play an important part in the documentation. It will provide a lasting record of traditional and contemporary uses of plants, promote a renewed sense of stewardship of the environment, and re-ignite dialogue between the generations. It will ultimately raise awareness of the importance of Scottish plants and their uses before the knowledge is lost forever. As well as using more traditional means of communication, the project will also be using the Internet to present its findings, allowing 50 million people world-wide to become virtual visitors to Scotland and its rich plant heritage.

The involvement of the Scottish public will be vital to the success of the project. Starting in March 1999, schools and the general public will be encouraged to become involved in the research programme by recording their own and their ancestors' uses of native plants. This Information will be presented across Scotland throughout the year 2000 in a range of activities including:

- A book providing the definitive expression of the state of plant use.
- A road show and outreach programme aimed at reaching schools and community groups.
- Major exhibitions.

For further information contact:

ANGELA KILDAY, Press & Marketing Officer, 20A Inverleith Row, Edinburgh, EH3 5LR. Tel: 0131 248 2900, Fax: 0131 248 2901, e-mail: a.kilday@rbge.org.uk

REQUESTS

PLANTS ON ROOFS: AN APPEAL FOR HELP!

I am working up a paper on the vascular plants of roofs and roof gutters, based primarily on a long-term survey in West Norfolk. But there is one aspect of this subject which is puzzling me: there are apparently no plants to be seen on *thatched* roofs in this part of the country, not even seedlings. Some county Floras (generally old ones) mention plants growing on thatch, and one or two botanical friends have told me of recent records, mainly in the West Country. There are perhaps 100 species growing on tiled and asbestos roofs in Norfolk: why none on thatch? Are thatched roofs too steeply pitched? Do fire-resistant chemicals inhibit plant growth? It may be that the material used for the thatch is relevant – *Phragmites* in Norfolk, *Triticum* (long-straw) elsewhere?

I should be grateful for any opinions or information that members in other parts of the British Isles may be good enough to let me have.

RON M. PAYNE, Applegate, Thieves Bridge Road, Watlington, King's Lynn, Norfolk, PE33 0HL

ADIANTUM CAPILLUS-VENERIS – A REQUEST FOR MATERIAL AND INFORMATION

As part of a study on the ecology, reproductive biology and population dynamics of the Maidenhair Fern we are keen to document the history of, and examine material from, the naturalised British and Irish populations of this species.

Molecular techniques will be used to determine whether these populations are likely to have been founded by a single spore, as seems most probable, and how the plants in these usually inland sites relate, if at all, with our rare native coastal populations.

Records of populations, however ephemeral, would be gratefully received, as would frond and rhizome material from any naturalised sites.

FRED RUMSEY, Conservation Biology Laboratory, Dept. of Botany, Natural History Museum, London, SW7 5BD. Tel. 0171 938 8867; e-mail: Fjr@nhm.ac.uk
 KATE PRYOR, School of Pure and Applied Biology, University of Wales-Cardiff, P.O. Box 915, Cardiff CF1 3TL

JOURNALS WANTED

To complete my set, I am anxious to obtain the following issues of the journal *North Western Naturalist*:

- Vol. 15 (1940) No. 3
- 16 (1941) Nos. 1, 2, 3
- 24 (1949) Nos. 1, 2, 3, 4
- 25 (1950) Nos. 1, 2, 3, 4
- 26 (1951) Nos. 1, 2, 3, 4

Can anyone help me to fill the gaps – or suggest a likely source? I will pay a reasonable price.

GORONWY WYNNE, Gwylfa, Licswm, Holywell, Flintshire, CH8 8NQ

OFFERS

JOURNALS FOR DISPOSAL

I have a nearly complete set of *Watsonia*, *BSBI Abstracts* and *Proceedings of BSBI* from 1965, free to collector, but acquirer must collect from me in Bristol.

JOHN REES, 24 Kings Avenue, Bishopston, Bristol, BS7 8JN. Tel.: 0117 9423295; E-mail: john@jsrees.freeseve.co.uk

I have the *Proceedings of the BSBI* from Vol. 3(2) Jan. 1959 complete to the end 7(4) May 1969. I am willing to give them away to anyone who will pay the postage.

CHRISTOPHER D.K. COOK, Institut fuer Systematische Botanik, Zollikerstrasse 107, 8008 Zurich, Switzerland. Tel.: ++ 1 385 44 11; Fax: ++ 1 385 44 03; E-mail: cook@systbot.unizh.ch

I have the following journals excess to personal requirements:

Bot. J. Linn. Soc. Volumes 62 to 92 (1969-1986)

J. Ecology. Volumes 52 to 74 (1964-1986)

These are complete runs in clean condition. They are available to anyone who would like the complete run of a particular journal for the cost of post and packing and the highest donation offered towards botanical research in v.c. 61.

PETER J. COOK, 15 Park Avenue, Withernsea, HU19 2JX. Tel.: 01964 614466; e-mail Coteds1@aol.com.

BOOK NOTES

BOOK NOTES

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

**The Bygone Botanists of Herefordshire.* M. Lawley. Pp 26. n.d. Price £3.75 incl. p.& p. from Mrs H. Colls, see below.

**A botanical stroll through North Herefordshire.* M. Lawley. Pp 73. n.d. (1998). [A very interesting introduction re tracing excursions of Victorian botanists: with a comprehensive checklist of the area with comments on frequency. Idiosyncratic (self-confessed) in nomenclature and use of source data, but none the worse for that!]

Price £4.00 incl. p.& p. from Mrs H. Colls, The Steppes Cottage, Jingle Street, Wonaston, Monmouth, Gwent NP5 4DL.

Our Trees. A guide to growing Northern Ireland's native trees from seed. Compiled & Edited D. Brown. Pp 72. Conservation Volunteers Northern Ireland. n.d. Price £5 incl. p.& p. from 159 Ravenhill Road, Belfast.

Three-language list of botanical name components. A. Radcliffe-Smith. Pp 143. Royal Botanic Garden, Kew. 1998. Price £9.99. (ISBN 1-900347-50-4).

Alternative agriculture – a history. Black Death to the present day. J. Thirsk. Pp xii + 365. Oxford University Press. 1997. Price £25 (ISBN 0-19-820662-3).

John Lindley, 1799-1865. Gardener-Botanist and pioneer orchidologist. Bicentenary Celebration Volume Ed. W.T. Stearn. Pp 232. Antique Collectors Club. 1999. Price £29.50 (ISBN 1-85149-296-8).

The Liverworts of the British Isles. Jean Paton. Pp 626. Harley Books. Due May 1999. Price £52.50 (ISBN 0-946589-60-7).

Standartliste der Farn-und Blütenpflanzen Deutschlands. R. Wieskirchen and H. Haeupler. Pp 765. Eugen Ulmer. 1998. Price £? (ISBN 3-8001-3360-1). [A complete checklist with a chromosome atlas].

Illustrations of British and Irish Orchids. D.M. Turner Ettliger. Pp 216. The Author, Royden Cottage, Cliftonville, Dorking, Surrey, RH4 2JF. 1998. Price £26.65 (p.& p. £1.03). ISBN 0-9530-380-1-7.

**Biologisches Wörterbuch : Deutsch-English/English-Deutsch.* E. Launert. Pp 740. Eugen Ulmer. 1998. Price £? (ISBN 3-8252-8105-1). [A 45,000 biological word dictionary].

**Flora Helvetica.* K. Lauber and G. Wagner. Pp 1616. Verlag Paul Haupt. 1998. Price C.£50.00 (ISBN 3-258-05735-4). [Covers exactly 3,000 species, with botanical descriptions, a small map, etc., at roughly 4 species to an A5 page, with the best photographs (also of every species) I have seen – not beautiful compositions, but pinpoint botanical reproductions that seem to help with all

species including sedges and grasses. A superb production, except for the size - 2½ ins thick – and weight – 4½ lbs. It comes with a separate booklet of keys and indexes (French, German, Italian and Latin).

DAVID PEARMAN, The Old Rectory, Frome St Quintin, Dorchester, Dorset, DT2 0HF

NEWS OF BOOKS FROM OUNDLE

Since my Autumn 1998 catalogue, various titles have increased in price, others, gone out of print, and yet other books have been published (including Stace's *Field Flora of the British Isles* – £17.95 incl. postage). Please contact me for the up-to-date supplement. Surely, the most exciting publication is the new *Red Data Book*. This has been edited by Martin Wiggington from data supplied by Society members. 468 pages. Up-to-date information on 408 taxa (including 118 microspecies) regarded as threatened in Great Britain, with details of their habitats and associated species. Maps showing pre-1970, 1970-1987 and post-1987 records by 10-km squares, and 1-km square frequency maps for 63 taxa. Hardback only, £30, postage £3.50

MARGARET PERRING, Green Acre, Wood Lane, Oundle, Peterborough PE8 5TP
Tel: 01832 273388; fax: 01832 274568; e-mail: perring@btinternet.com

WILTSHIRE BOTANY

Issue No. 2 of *Wiltshire Botany*, Wiltshire Botanical Society's journal, is now published. It contains an account of the early history of studying brambles in Wiltshire by Rob Randall, an article about bryophytes in Wiltshire by Rod Stern, keys for identifying Wiltshire umbellifers by John Presland, a study of Wiltshire river channel flora in the 1990s by Jack Oliver, and a selection from our plant records for 1996.

Copies are available from Mrs Jean Wall, Wiltshire Wildlife Trust, 18/19 High St., Devizes, Wiltshire SN10 1AT (Tel 01380 725670). The cost is £2.50 by post and £2 if collected at the office. Cheques should be made out to *Wiltshire Botanical Society*, not to the Trust.

JOHN PRESLAND, By-the-Way, 175c Ashley Lane, Winsley, Bradford-on-Avon, BA15 2HR

REPORTS OF FIELD MEETINGS — 1998

Reports of Field Meetings (with the exception of Atlas 2000 reports written by Trevor Dines and 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.

SHAPWICK HEATH and SOUTHLAKE MOOR, N SOMERSET (v.c. 6), 6th & 7th JUNE

23 members met at Westhay for a two-day meeting on the Somerset Levels. The weekend began with an optional visit to the Peat Moors Visitor Centre, which comprised of a short introductory talk about the pre-history, peat extraction industry and the wildlife interest of the Somerset Levels. There was an opportunity to sit around a smoky hearth in the gloom of a reconstructed iron-age roundhouse, to see a

display of ancient crafts, including weaving, iron smelting and pottery, and to explore the different types of prehistoric wooden trackways.

At the National Nature Reserve of Shapwick Heath was seen a mixture of worked out peat, remaining species-rich neutral grassland and Alder/Willow carr. The Nationally Scarce *Thelypteris palustris* (Marsh Fern) was abundant along the damp shady paths with other ferns including *Dryopteris carthusiana* (Narrow Buckler-fern). The beautiful *Carex pseudocyperus* (Cyperus Sedge) was frequent along the ditches and *Hottonia palustris* (Water-violet) was flowering from submerged leaf rosettes. Progressing along the path through the open areas in the Birch/Alder/Sallow woodland, the magnificence of the huge clumps of *Osmunda regalis* (Royal Fern) was appreciated amongst the jungle-like growth of this seemingly primitive landscape. An added delight was the sound of Cetti's Warblers singing stridently from the sallow scrub along the disused railway.

After lunch the party travelled a few miles to Catcott Heath. *Potamogeton coloratus* (Fen Pondweed) and *Utricularia minor* (Lesser Bladderwort) were recorded in some of the recently dug experimental pits that have been established on one of the Somerset Wildlife Reserves and *Peucedanum palustre* (Milk-parsley) was frequent amongst the *Myrica gale* (Bog-myrtle) bushes. A brief visit was made to the near by Catcott Parish Plot to see the *Cladium mariscus* (Great Fen-sedge) in its only remaining native site on the Somerset Levels, and the very rare *Lathyrus palustris* (Marsh Pea), growing amongst tall fen. Some of the participants, who were staying in the area, met up at the local pub in the evening for a meal and continued chat about the day's botanical and landscape interest.

On the Sunday we gathered in the car park at Burrow Bridge, and climbed Burrow Mump, one of the small hills which rise above the Somerset Levels. On the top is a ruined church and there is a grand view over the levels all around and over to the Quantock Hills. We failed to relocate *Petroselinum segetum* (Corn Parsley) but we found *Rumex pulcher* (Fiddle Dock) and *Salvia verbenaca* (Wild Clary) on the steep slopes. Some time was spent distinguishing the leaves of *Leontodon hispidus* (Rough Hawkbit), *L. saxatilis* (Lesser Hawkbit), *L. autumnalis* (Autumn Hawkbit), *Crepis capillaris* (Smooth Hawk's-beard) and *C. vesicaria* (Beaked Hawk's-beard).

Once more down on the levels, we walked a short way along the River Parrett, which bounds Southlake Moor on its eastern side. This moor, with its lozenge shaped system of ditches, is mainly pasture grazed by cattle and sheep. The first ditches we came to were hedged and rather shady and the water level was fairly low, but emergents such as *Equisetum fluviatile* (Water Horsetail), *Iris pseudacorus* (Yellow Iris), *Mentha aquatica* (Water Mint) and *Sparganium erectum* (Branched Bur-reed) were found.

Further along we started fishing for submerged species. Fine leaved *Potamogeton* species such as *P. berchtoldii* (Small Pondweed), *P. trichoides* (Hairlike Pondweed), and *P. pusillus* (Lesser Pondweed) with *Zannichellia palustris* (Horned Pondweed) were abundant in some ditches, whereas in others the dense covering of the various *Lemna* species shaded them out. Many ditches were edged with sedges including *Carex riparia* (Greater Pond-sedge) and an abundance of an unusually large and leafy *C. nigra* (Common Sedge). On the upper banks there was frequent *Lychnis flos-cuculi* (Ragged-Robin), with *Filipendula ulmaria* (Meadowsweet) and *Samolus valerandi* (Brookweed).

Depending on the management, the ditches on opposite sides of the droves contained different assemblages of species. More regularly cleared ditches contained *Potamogeton crispus* (Curled Pondweed) and *Elodea nuttallii* (Nuttall's Waterweed), whereas others contained more emergent species such as *Alisma plantago-aquatica* (Water-plantain), *Butomus umbellatus* (Flowering-rush) and *Oenanthe fistulosa* (Tubular Water-dropwort) growing through rafts of *Hydrocharis morsus-ranae* (Frogbit).

The weather held sunny and warm until at lunch-time when there was a short downpour and everyone retreated under their waterproofs. The sun came out again and we continued our ramble along the ditches finding *Hottonia palustris* (Water-violet), *Oenanthe aquatica* (Fine-leaved Water-dropwort), *Sagittaria sagittifolia* (Arrowhead), *Stellaria palustris* (Marsh Stitchwort) and *Wolffia arrhiza* (Rootless Duckweed). One ditch was entirely covered in *Azolla filiculoides* (Water Fern).

The return to the Mump took us past *Althaea officinalis* (Marsh-mallow), growing in clumps alongside the ditches. We looked for *Sium latifolium* (Greater Water-parsnip) which was not to be found where it had previously been recorded. A green tangle of what looked like fishing line was pulled out of one ditch and the group decided it was a stonewort but no one knew which one. A *Tolypella* species was suggested so it was duly sent off for identification to Nick Stewart. He determined it as *Tolypella prolifera* (Great Tassel-stonewort), rare in the British Isles and a new record for Southlake Moor.

Back at the car park, most of the party set out for home but four of us continued over to Aller Hill, which could be seen in the distance. Here, after a steep climb and short walk we found *Althaea hirsuta* (Rough Marsh-mallow) growing on steep, well grazed turf with bare patches of soil, with some plants already in flower. Though getting late the sun was still bright enough to take a few photographs.

Thanks to all participants for a most enjoyable weekend.

LIZ McDONNELL & KAREN POLLOCK

TREUDDYN, FLINTSHIRE (v.c. 51) 20th JUNE

This was a meeting to record for the 'Atlas 2000' project. 7 members attended, 5 from Flintshire, 1 from Cheshire and 1 from Swansea. Thanks are due to Mr Bob Newnes and to Mr and Mrs Roger Roberts for permission to enter their land. Mrs Roberts kindly provided refreshments at the end of the day.

The party divided into two groups to visit sites within the same 10-km square (SJ/2.5).

The first group worked a 2 km stretch of the River Cegidog, a tributary of the River Alun flowing north-east through a narrow, well-wooded gorge. The going was difficult in places, with blocked footpaths, very steep banks, deep mud and dense undergrowth, but the area yielded 145 species, including some locally uncommon plants such as *Chrysosplenium alternifolium* (Alternate-leaved Golden-saxifrage), *Geum* × *intermedium* (*G. rivale* × *G. urbanum*) (Hybrid Avens) and *Epipactis helleborine* (Broad-leaved Helleborine).

The second group botanised in an area of country lanes, disused limestone quarries, mixed woodland and another stretch of the River Cegidog. A very creditable list of 215 species was compiled. Again, there were no startling discoveries, but it was pleasing to record *Ophrys apifera* (Bee Orchid) and *Coeloglossum viride* (Frog Orchid).

My warmest thanks to all who took part.

GORONWY WYNNE

GREENLAW, BERWICKSHIRE (v.c. 81), 13th JULY

This meeting was held to record for Atlas 2000 and the 16 members who attended enabled all the objectives to be carried out. The party was split into groups and amongst the more interesting plants recorded were:

Lythrum portula (Water-purslane), *Blysmus compressus* (Flat-sedge), *Dianthus deltoides* (Maiden Pink), × *Festulolium loliaceum* (Hybrid Fescue), *Trifolium striatum* (Knotted Clover), *Scleranthus annuus* (Annual Knawel), *Sherardia arvensis* (Field Madder), *Veronica polita* (Grey Field-speedwell), *Butomus umbellatus* (Flowering-rush) and finally, and probably less welcome, *Crassula helmsii* (New Zealand Pigmyweed).

From a summary by MICHAEL BRAITHWAITE

REPORTS OF INDOOR MEETINGS - 1999

THE CHANGING FLORA OF CAMBRIDGESHIRE BSBI DRUCE LECTURE, CAMBRIDGE, 6 FEBRUARY 1999

An audience of almost 100 members of BSBI and other societies enjoyed a fascinating illustrated lecture by Dr Max Walters and we extend our warmest thanks to him, to John Parker (for the use of the Gilmour Building) and to Philip Oswald for much local assistance.

The following account has been prepared from Dr Walters' notes.

AILS A BURNS, Hon. Meetings Secretary

I am very pleased to be able to give the Botanical Society of the British Isles' Druce Lecture today, not least because, in the time-honoured Oxbridge tradition of rivalry, I can follow two other *Cambridge* men – my colleagues Frank Perring and David Allen – whose own Druce lectures of 1995 and 1996 have set the pattern for future lectures named after George Claridge Druce, a quintessentially *Oxford* product. Druce seems, indeed, to have only rarely visited Cambridge or set foot in v.c. 29, although we do owe to him the discovery of the first list of plants ever made for our County – that compiled by Samuel Corbyn in 1656. We should also remember that his friendship with Alfred Fryer enabled him to visit especially the Chatteris area in the Fens from time to time. And finally, I share a very special day with Druce - our birthday, 23 May – is also, by a happy coincidence, the birthday of Linnaeus himself! What more could one wish for?

And so to my subject today. Our County of Cambridgeshire – that is, v.c. 29, the Old Cambridgeshire, excluding Hunts. – is the best-documented County in Britain (perhaps, even, the best-known region in the world?) with regard to its flora. This is a boast that Cambridge botanists have always made in my lifetime, and I at any rate see no reason to question the claim. We possess an unrivalled series of County Floras, beginning with that pioneer work we fondly call 'The Cambridge Catalogue' (to give it the full Latin title: *Catalogus plantarum circa Cantabrigiam nascentium*), published in 1660, and beloved of generations of Cambridge botanists. I must resist the temptation to turn this lecture into an eulogy of John Ray, author of our first County Flora, and be content to remind you that Charles Raven's definitive study of the life of Ray is still available in bookshops (Raven, 1942, ed. 2 1950, reprinted 1986). We should, however, remember that there were Cambridge botanists of real stature before Ray, and I would especially mention Northumbrian-born William Turner (1510-1568) often counted as the first English botanist, and author of *A New Herball*, in three volumes, the first volume of which was published in 1551. With the completion of the facsimile edition of this great work, fittingly undertaken by Cambridge University Press and published in 1996, local botanists can find for themselves which Cambridgeshire plants Turner knew from his undergraduate days in Pembroke (then Pembroke Hall).

So we have this extraordinary rich tradition, and my task is to extract from the considerable body of information something which might entertain and interest members of the BSBI. I have selected to do this, not by compiling lists of examples and statistics to illustrate change, but by selecting a few case-histories which I can illustrate with slides and talk about the particular aspects of change that those cases exemplify. I am aware that this may disappoint some of you, because it makes for a rather lightweight paper, but I am not the County Recorder, only an old man who has lived through (and ± continuously experienced) floristic and vegetational change in and around Cambridge for nearly 60 years. At this point I should acknowledge my indebtedness to Gigi Crompton, Recorder for v.c. 29 (a task she now shares with Derek Wells) who is preparing a very detailed Historical Flora of our County. I have shared information with Gigi over many years, and she remains a steadfast enthusiast for the

Cambridgeshire flora. I suppose we *could* start our survey quite legitimately with, say, the Barnwell Arctic flora which flourished hereabouts more than 20,000 years ago, and my first slides might have been of those impressive Late Glacial survivors *Dryas octopetala* (Mountain Avens) and *Potentilla fruticosa* (Shrubby Cinquefoil). As a student of the late Sir Harry Godwin and a colleague of his eminent pupil Richard West, I feel I ought to apologise for not doing this. My excuse is that Godwin and West's expertise is not mine or Gigi's, and 'historic' to us means after, say, the 16th century.

The existence of Cambridge University is, of course, the single obvious reason why our local flora is so well-documented. Most of us are familiar at least by name with the botanical studies of John Ray, and perhaps tend to assume that records before Ray are of little or no importance. But we have no excuse for ignoring Turner, the greatest of the sixteenth century English botanists. So let us start with three very familiar Cambridge plants first recorded some 450 years ago in our county by Turner (I give their modern Latin names, of course).

Helleborus foetidus (Stinking Hellebore). Given in the *Libellus de Re Herbaria* (1538), Turner's early work, in Latin. The reference is:

'Elleborum nigrum . . . Caeterum censeo illam herbam quam vulgus cantabrigiense, vocat Bearefote esse verum elleborum nigrum. Turner, 1538, 49.'

Although people have identified this as *H. foetidus*, there seems to be real doubt which of three *Helleborus* species Turner is referring to . . . a good example of a general problem with the use of all old records, and a reminder of why the voucher specimen in a Herbarium became in the 19 Century (and remains today) an essential part of accurate recording.

My second choice of a Turner plant is quite unambiguous: *Petasites hybridus* (Butterbur). In the *New Herbal part 2*: 494 (1562) he says:

'*Petasites* . . . This herb is called . . . in Cambridgeshire a Butterbur.'

As many of you will know, this plant is still growing by the River Cam in the little Nature Reserve of Paradise exactly where John Ray recorded it in the Cambridge Catalogue over 300 years ago. (See my paper in *Nature in Cambridgeshire* 33: 101-2 and plate on inside back cover).

The third Turner plant (or group of plants) has excited interest amongst generations of Cambridge botanists. As Chris Preston puts it in the most recent addition to the literature on the wild *Primula* species in Cambridgeshire (*Nature in Cambs.* 35: 29-60 (1993)):

'It [*Primula elatior* (Oxlip)] combines three attributes which lead botanists to take a special interest in a species – aesthetic appeal, rarity value and academic interest.'

This is what Turner says in 1564:

'A Coweslippe is named in the Herbaries & Apothecaries' Latin herba paralysis, and there are two kinds of them, and one is redder yellow than the other, and the other paler. They differ also in smell, for the one smelleth better than the other. The one is called in the West country, of some, a Cowslip, and the other an Ox slip, & they are both called in Cambridgeshire Pagles. Turner, 1564, 767.'

There are, of course, other records between Turner and Ray. I have selected only two: *Malva moschata* (Musk Mallow) recorded by Gerard 1597-1636; and *Geranium phaeum* (Dusky Crane's-bill) recorded by Pratt, Fellow and Senior Bursar of Trinity c. 1645. Of this species Pratt writes:

'in horto meo Colleg. Trin. Cantab sponte nascitur ut opinor.'

Before we move on to John Ray, the great man himself, it would be useful to make one or two points about the value and interest of old records. I am sure that Gigi and others working on the *Historical Flora* would say that the game is entirely justified for its own sake, and I would heartily agree with this. But our subject is the *Changing Flora of Cambridgeshire*, not the *Changing Botanists of Cambridgeshire*, and we have to evaluate old records as evidence of a changing flora. It is obvious from the 'Bear's foot' problem that too much reliance on written records before Ray might be very misleading. On the other hand, the sort of careful assessment that the *Historical Flora* team is making is both entertaining and eminently worthwhile.

And now for Ray. What do we choose to illustrate his accurate botanical knowledge? My favourite is *Geranium sanguineum* (Bloody Crane's-bill), which Ray calls '*Geranium haematodes* the Bloody

Crane's-bill'. I am sure you all know about this remarkable survivor, still happily growing more or less where Ray tells us it was in 1660:

'Found on Newmarket Heath in the Devil's Ditch, also in a wood adjoining to the highway betwixt Stichwort and Chidley.'

The particular pleasure we derive from visiting the Devil's Dyke at the point where it is crossed by the road is that we are reasonably sure that what Ray saw there is what we see today - with one important difference. There is probably a good deal *more* of the plant now, because some 150 years ago, in Henslow and Babington's time, the Cambridge-Newmarket railway was cut through parallel to the road, and the *Geranium* has colonised the railway cutting and adjacent land.

Unfortunately, most cases illustrate the opposite situation: a Ray plant now extinct in the County. Perhaps the most famous of these is the Fen Orchid, *Liparis loeselii*. I just missed seeing this remarkable little orchid growing wild in Cambridgeshire, though Charles Raven *did* succeed in seeing it before it became finally extinct at Wicken after 1945. Ray calls this plant, which was quite new to him, 'the Dwarf Orchiss of Zealand', and says it is growing 'in the watery places of Hinton and Teversham moors but more rarely'. The really impressive thing, however, is that he gives us a remarkably accurate, minute description of the plant, part of which goes as follows (I am using Ewan & Prime's translation of the *Catalogus* description in Latin):

'This plant is singular; it has a bulbous root the inside of which is compacted of scales and quite different from any other orchid for the root fibres grow below, not above and alongside the bulb, and, further, it propagates itself by short stolons which swell into new bulbs. It puts out two pale green leaves between which the angular stem grows, bearing three, four or even more little flowers at the tip. These are pale green with six floral parts and the column in the middle. The column is green, marked with a black spot at the apex and is slightly curved as if it filled the role of a cowl or hood.. The seed capsules are well depicted in the drawing of Lobel and in general his picture portrays the plant very well, but the description does not agree with the picture.'

Our next 'historic plant', which was actually first recorded in Cambridge by Gerard, is the most famous – and surely most beautiful – of all our local wild flowers – the Pasque Flower, *Pulsatilla vulgaris*. Again Ray tells us where he found it:

'On the left hand of the way over Gogmagog Hills leading to Haverhill, so soon as you come to the top of the hill.'

Happily, we still have Pasque Flowers in Cambridgeshire, though our best local display is just outside the County boundary. Ray adds an interesting little note after telling us where the Pasque Flower grows (again using Ewan & Prime's translation):

'In our own experience it grows well enough in gardens in rich fertile soil, not in a hot, sunny place; in fact, it flourishes, flowers and spreads freely.'

Ray, and almost all naturalists before the nineteenth century, saw nature as God's creation made for man's use and pleasure. The conservation of nature was not a problem. Nowadays, of course, we go to great lengths to discourage people from taking in wild plants into their gardens, and explain to a very receptive audience that all the hollow circles on the *Atlas of the British Flora* map of the Pasque Flower which are places where the plant formerly grew are at least in part due to gardeners having admired this beautiful wild flower and dug it up to grow it for themselves.

Reluctantly, we move on from Ray, and choose from the 18th Century one of many Cambridgeshire plants first recorded by Richard Relhan in his *Flora Cantabrigiensis* 1786. This is the famous umbellifer *Peucedanum palustre* (Milk-parsley), food plant of the even more famous Swallowtail butterfly, and now only to be found in the county at Wicken Fen Nature Reserve. I hesitated whether to choose from Relhan's work the other umbellifer whose first Cambridgeshire record is due to him – *Seseli libanotis* (Moon Carrot) – but decided in favour of *Peucedanum* because it illustrates how biased, inevitably, were the early Cambridge naturalists towards Cambridgeshire proper, and how relatively little the Isle of Ely was explored. Wicken Fen was unknown by that name to any naturalist until the middle of the last century: the Nature Reserve as we now know it celebrates its Centenary this year!

The third edition of Relhan's Flora appeared in 1820. It contains an impressive treatment of all the lower plants, and sets a pattern (alas, *not* followed by Babington in his *Cambridgeshire Flora*, 1860) of inclusion of all lower and higher plants in most modern County Floras. So one could devise a very different lecture if there were a meeting of the British Bryological Society and not the BSBI!

The nineteenth century sees the rise, and popularising, of the recording system for higher plants that we still use today. John Stevens Henslow, fourth Professor of Botany in this University, appears on the scene in 1825, and rescues what he can of the 18th Century Herbarium of his predecessor Thomas Martyn, who had retained the Chair for the last 25 years of his long life but hardly ever visited Cambridge! I expect you know that Henslow was an enthusiastic, practical and well-organised young man. His local excursions and soirées at his home enormously impressed the young Charles Darwin, and this relationship between teacher and pupil lasted throughout Henslow's life. But that is another story!

The plant I have selected to illustrate the young Henslow's recording of the Cambridgeshire flora is, we believe, the earliest herbarium specimen of a Cambridgeshire plant made by him. This is *Paris quadrifolia*, Herb-Paris, and it well illustrates Henslow's attitude to his subject, which in no way deserved the reputation he has come to have in some accounts of the history of botany in Britain. He was emphatically not a narrow systematist: competent in mathematics, more than competent in geology and mineralogy (he held the Chair of Mineralogy for three years before moving to Botany!), and in particular very interested in all questions of plant physiology (which in his day included all studies we would now put into compartments labelled ecology, plant geography and genetics). Henslow's study of the meristic variation in local Cambridge *Paris* illustrates just one aspect of his wide interest in Botany, and we are fortunate to have some of the material preserved from his large samples.

You may detect here a danger that I am going on about my hero. Well, Ann Stow and I are writing a book on Henslow, and you must wait for that! I will just mention one more of Henslow's Herbarium specimens – that of *Ornithogalum nutans* (Drooping Star-of-Bethlehem), which he recorded as a garden escape 'abundant but accidentally between Cambridge and Trumpington. 2 May 1821'. Note what a complete specimen this is: four years before he obtained the Chair of Botany he was already preparing the sort of specimen he could use to teach students, not just the parts of the flower, but the vegetative and underground parts also.

Henslow was succeeded on his death in 1861 by his former pupil, C.C. Babington. The relationship between the two is rather a sad story. The young Henslow as enthusiastic teacher had impressed Babington just as he had fired Darwin's imagination. But when Henslow ceased to reside in Cambridge after being given the living of Hitcham and became increasingly immersed in the affairs of his parish, Babington's tone changed. One can feel for Babington, waiting for dead men's shoes: but I find it difficult to forgive him for playing down Henslow's part in laying the foundation, not only of Babington's beloved Herbarium, but of the recognisably modern field botany which many of us still appreciate today.

Babington's *Flora of Cambridgeshire* (1860) gives us the first glimpse of Victorian pessimism and concern for what has already been lost in terms of habitats in and around Cambridge. In this famous passage he deals with 'the Chalk County':

'Until recently (within 60 years) most of the chalk district was open and covered with a beautiful coating of turf, profusely decorated with *Anemone Pulsatilla*, *Astragalus Hypoglottis* and other interesting plants. It is now converted into arable land, and its peculiar plants mostly confined to small waste spots by road-sides, pits, and the very few banks which are too steep for the plough. Thus many species which were formerly abundant have become rare; so rare as to have caused an unjust suspicion of their not being really natives to arise in the minds of some modern botanists. Even the tumuli, entrenchments, and other interesting works of the ancient inhabitants have seldom escaped the rapacity of the modern agriculturalist, who too frequently looks upon the native plants of the country as weeds, and its antiquities as deformities.'

We also remember Babington especially because he was the first botanist to tell us explicitly what was growing on Wicken Fen – though he did not live to see the creation of the Nature Reserve there.

What he tells us about the Fen Violet (*Viola stagnina* to him: we now call it *V. persicifolia*) is especially interesting. In an appendix to the *Flora* he gives a remarkably complete list of ‘the plants which have been recently found growing at Wicken Fen’, and marks with an asterisk ‘the names of those which most abound there’. The Fen Violet receives an asterisk! Conversely, *Frangula alnus*, the Alder Buckthorn, is absent from his list, but he knew the plant well in other Cambridgeshire localities. There is a long story attached to these two observations by Babington and their significance in understanding the ecological changes at Wicken Fen in the present century: I recommend the excellent new book *Wicken Fen: the making of a wetland nature reserve*, edited by Laurie Friday if you want to know more.

What do we say of the present century? In Cambridgeshire I have experienced just over 60 years from my first visits to Wicken Fen, the Gog-Magog hills and the boulder-clay woods just on the outbreak of the Second World War. On the credit side I have seen the growth of the present nature conservation movement, but, of course, like Babington, I have also seen modern agriculture produce an even more dramatic ‘desert’ in terms of the traditional flora. What has become increasingly obvious to me is that, *purely at the level of new species*, our flora is being enriched as it is being denuded. Emotionally, we are conditioned by the vision of an ideal, 18th century landscape, and want to return to it. So, to conclude our survey, let us take some positive additions to our flora, and some losses from our flora, and try to sum up.

First, the additions. Some of these, like *Veronica filiformis* (Slender Speedwell), I have seen arrive and succeed in my lifetime. Its story is remarkably parallel to the Collared Dove. Both of them started in the Near East, and inexorably made their way across Europe in the post-war period. We can reasonably suppose that this kind of spread of ‘new’ species to occupy ‘new’ habitats was going on in the past as it is today. But one thing is different now from previous centuries. This is the fashion in recording and what one might call the bias towards ‘native’ plants. Here the recent swing to record all obvious and casual garden escapes, as in Stace’s *Flora*, and the new *Critical Flora* being written by Peter Sell and Gina Murrill here in Cambridge, seems to me a very sensible change. In very many ways, the strong apartheid between botanists and gardeners has broken down. My own career, as Curator of the Herbarium and then Director of the Botanic Garden, has conditioned me to accept this swing of fashion. Here is just one example. There are no Snowdrops in Cambridgeshire, according to the Floras of Ray, Relhan and Babington, and only one Snowdrop in Britain according to the most recent edition of Clapham, Tutin and Warburg. But Sell and Murrill have four species of *Galanthus* and several infraspecific taxa and hybrids. What is more, they supply a key so that you can identify them. And Cambridgeshire churchyards are very happy hunting-grounds for these different Snowdrops.

Another example takes us into a different area, that of critical genera. The 19th century showed a great flowering of the study of genera like *Rubus* and *Hieracium*, and I do not blame anyone for claiming that this game can be left to the few who want to enjoy it. But some knowledge of the common taxa and their changing history is clearly interesting. I choose one Cambridgeshire example: *Rubus procerus*, a handsome bramble originally a garden plant (‘Himalayan Giant’ its popular if misleading name). When we wrote our *Cambridgeshire Flora* in 1964 we said for this very common Bramble ‘Commonly grown in gardens and probably escaping more frequently than records suggest.’ We were quite right!

Finally, on the credit side, we acquire new taxa when an expert visits us and shows us something new. Like the ‘Wicken Nettle’, *Urtica galeopsifolia*. A stingless nettle, standing up to 2 m high, with very narrow leaves, it looks at Wicken very different from the common weed *Urtica dioica* (Common Nettle), which is also present. Botanists have known this plant for some 50 years at Wicken, but it was not until 1992, when the Russian botanist Dmitri Geltman published an account of the plant (in *Watsonia* 19: 127-129) following a visit to Wicken, that we knew what our nettle was in European terms.

Finally, on the negative side. Cambridgeshire has lost many native species in the recorded history of our flora, especially from the drained wetlands where the habitat has totally disappeared. *Liparis loeselii*, the Fen Orchid is just one of several species no longer found anywhere in v.c. 29. But there are a much larger number of species now local and more or less confined to nature reserves and protected

areas that were once widespread. This is clearly an important change, and the Society's Atlas 2000 project, it is hoped, will reveal to what extent such changes have actually taken place in the near half-century since our original Atlas project. Watching Oliver Walston, our local arable farmer, present his four recent TV programmes on the crisis in European agriculture, we can only view the future with apprehension. We are all for the environment and the conservation of nature: but do we have the clear vision and the political power to reverse some ominous trends? In particular, must we retreat into ghetto-like 'protected areas' and let efficient agriculture dominate the countryside? Is there any real future for the idea of the wilderness? These are big questions which those of you under the age of 50 will have to decide. I wish you well!

MAX WALTERS, 1 Symonds Lane, Grantchester, Cambridge, CB3 9NU

ANNUAL EXHIBITION MEETING 1998 – ABSTRACTS

The reports that follow have been edited for publication by Ailsa Burns.

THISTLE BROOMRAPES IN YORKSHIRE

A project is being undertaken by English Nature, the Conservation Section of Leeds City Council, the Department of Environmental Science at the University of Bradford and interested individuals to establish the ecological requirements of *Orobanche reticulata* (Thistle Broomrape).

The exhibit showed progress so far.

Mrs P.P. ABBOTT

SOME CONTINENTAL *RUBI* MOST LIKELY TO OCCUR IN ENGLAND

The *Rubus* flora is now well explored in all the countries of North and West Europe with the conspicuous exception of France. Although most of the species common and widespread in the western part of the Continent also extend to Britain, a few of them have still to be detected on this side of the Channel. Twelve of these were exhibited:

- *R. plamus* Beek (subgenus *Rubus*) – locally common in N Belgium and S. Netherlands
- *R. dejonghii* Beek (series *Sylvatici*) – common around Amsterdam, locally common in N Belgium, extending to Luxembourg.
- *R. vulgaris* Weihe & Nees (series *Sylvatici*) – C & NW Europe; apparently widely distributed in France.
- *R. amiantinus* (Focke) Foerster (series *Discolores*) – N France, the Low Countries, the Rhineland south to the Black Forest.
- *R. geniculatus* Kalt. (series *Discolores*) – Belgium (common), W Germany, perhaps also widespread in N France.
- *R. grabowskii* Weihe (series *Discolores*) – much of Europe, north to S Norway, east to Rumania, south to C Italy.
- *R. montanus* Libert ex Lej. (series *Discolores*) – most of Europe.
- *R. conspicuus* P.J. Mueller ex Wirtgen (series *Vestiti*) – N France, the Low Countries, the Rhineland.
- *R. nigricatus* P.J. Mueller & Lef. (series *Glandulosi*) – W Europe. Abundant in at least one large woodland area at the base of the Cherbourg Peninsula.
- *R. camptostachy* G. Braun (section *Corylifolii*) – N & C Europe, from S Sweden through Germany to the Low Countries, east to Poland.

- *R. ferocior* H.E. Weber (section *Corylifolii*) – NW Europe
- and 'C13' an unnamed member of series *Sylvatici* – locally abundant in woods and on maritime heathland around Cherbourg.

Dr D.E. ALLEN

THE UK FLORA PROGRAMME OF THE MILLENNIUM SEED BANK PROJECT

The UK Flora Programme aims to collect and store at least one sample of seed from every native higher plant species in the UK.

The programme, part of a 13 year Project funded by the Millennium Commission and supported by organisations such as the Wellcome Trust and Orange plc, runs from 1997 to 1999 and has a target of 800 species to sample. This is in addition to the 579 species already held in the Kew Seed Bank at Wakehurst Place as a result of previous collaborative work with organisations such as English Nature.

At the end of the 1998 collecting season, seed from 546 species has been collected, somewhat over the 2-year target. This success is largely due to the excellent response from volunteers, including many members of the BSBI. Volunteers are now being sought for the last year of the Programme.

Mr S. ALTON, UK Co-ordinator, Millennium Seedbank Project

A CYTOLOGICAL SURVEY OF *BUTOMUS UMBELLATUS* (FLOWERING-RUSH) IN THE BRITISH ISLES: AN UPDATE

The exhibit presented in 1997, (see *BSBI News* 78: 87, 1998) was updated with the results of a study in 1998. In Britain, most populations have proved to be triploid. These include native populations such as that by the River Cam in Cambridge, where the species was first reported by John Ray in 1660, and the invasive populations along the River Eden in Cumberland and the River Tweed in Northumberland and Berwickshire. There is an area in S.W. England where the triploids are apparently replaced by diploids and we are currently attempting to delimit this area more precisely. In Ireland, the pattern is reversed, with triploid counts from the two southerly populations (including that along the River Boyne) and diploid counts from Upper Lough Erne and Lough Neagh. We have found seed in diploid populations in both Britain and Ireland but not in triploid populations.

Dr J.P. BAILEY & Dr C.D. PRESTON

THE YOUNG BOTANIST

A copy of '*The Young Botanist*' was displayed and comments were invited. *The Young Botanist* is a special new BSBI newsletter intended to appeal to children.

WHAT IS THIS IN MY PORRIDGE?

Samples of 'foreign' seeds recovered from porridge made from organic oats were shown and identification was invited. (The suggestion of *Galium aparine* (Cleavers) was later confirmed, experimentally, by Dr C. Turner.)

Miss A. BURNS

JUNCUS × *KERN-REICHGELTII*

The exhibit showed specimens and scatter diagrams (number of vascular bundles in stem against length of spathe in cm) from populations in v.c. 46, Cards, suggesting that the hybrid between *Juncus conglomeratus* (Compact Rush) and *J. effusus* (Soft-rush) is commoner than is usually supposed and that it occurs at both high and low altitudes. Identification is difficult because of the great variation of the parents but the hybrid is characterised by its stem being ridged while having more than 30 vascular bundles; it is intermediate in most other characters. Pure *J. conglomeratus* is absent from some populations consisting of the hybrid and *J. effusus* and the hybrid plants with their ridged stems are probably often mistaken for it.

Mr A.O. CHATER

POLYGONUM COOKII: A MYSTERIOUS ‘MAMMOTH’ JAPANESE KNOTWEED

About a century ago, in the period 1886-1910, a mysterious ‘mammoth’ Japanese Knotweed was grown in a Gloucestershire garden near Lydney belonging to a Surgeon-General Henry Cook (1831-1927). The stock was acquired in 1907/1910 by the Nursery Gardeners V.N. Gauntlett and Co. of Chiddingfold, Surrey, and advertised as ‘*Polygonum cookii*’ in their catalogue 101 (c.1925+). Described as ‘16ft tall with 5in circumference culms,’ an illustration showed leaves broader and shorter than in *Fallopia sachalinensis*. Could this *P. cookii* be the hybrid *F. × bohémica* two stands of which are known today c.2 -3 km downstream from the former nursery site?

From where did Cook get his ‘mammoth’ Japanese Knotweed? Gauntlett’s indicated North America. Cook went to India c.1856, served with the Indian Medical Service, retired in 1886 and was then resident in Gloucs. until c.1910. Nothing is known about plant-collecting travels but a book about his ‘wild garden’ was published in 1903.

PERSICARIA CAPITATA FROM WALES

Persicaria capitata (Pink-headed Knotweed) was seen on a pavement outside a Pwllheli shop (v.c. 49) in November 1998, apparently the first record for Wales. The earliest reports (*BSBI News* **34**, 1983; **36**, 1984) of this barely hardy alien, other than intentional cultivation, were from Chichester (1968), coastal or near coastal sites in Southern England, Guernsey, and Chelsea (London). Inland sites followed in the 90s – Cheshire (v.c. 58), Worcs. (v.c. 37), (*BSBI News* **71**, 1996, **78**, 1998). Do these first two stages presage a potential major spread, even extending into natural habitats?

Miss A.P. CONOLLY

THE FLORA OF GLOUCESTERSHIRE: STEPHEN BISHOP (1946-1997)

In 1982, Stephen Bishop formed the Gloucestershire Flora Committee with a view to publishing a new county flora based on tetrad recording.

Under Stephen’s leadership the project had amassed almost 200,000 records prior to his tragic death in 1997. Stephen’s tireless field recording produced the overwhelming majority of these records. As well as his records, Stephen also left 1570 distribution maps and over 300 draft species accounts.

Although incomplete, Stephen Bishop’s work adds considerably to our knowledge of plant distribution in Gloucestershire.

As a first step towards getting this material into the public domain, the Gloucestershire Naturalists’ Society plans to publish Stephen Bishop’s distribution maps and species accounts during 1999.

Mr R.J. COOPER. & Mr M.A.R. & Mrs C. KITCHEN

A MISCELLANY OF RECENT ABERRATIONS

By its nature there was no uniting theme behind this display. A new form of proliferous daisy, *Bellis perennis*, had been discovered this year in the Forest of Dean, (by Rosemary Castle), as two seedlings, thus allowing the possibility of exploring the genetic base of the condition. A dandelion (*Taraxacum* sp.) was displayed with a secondary flowering stem emerging through the middle of the inflated basal stem. Other teratisms included a *Bergenia* leaf with increased cell division along the midrib, producing two extra 'edges' of tissue, a proliferous *Nigella*, and a flowering spike of *Acanthus* with reversion to leaves at the top.

Amongst pigment aberrations there were a pink-flowered (well, if you looked hard enough) *Anthriscus sylvestris* (Cow Parsley), a *Bellis perennis* with marginal variegation in the winter and a nearly yellow-leaved *Ranunculus ficaria* (Lesser Celandine).

A desire to understand the range of stable pigment forms prompts the suggestion of a project 'Floraurea' (see page 48)

Mr M. CRAGG-BARBER

THE DISTRIBUTION OF THREE INVASIVE PLANT SPECIES ALONG THE RIVERS USK AND TAFF AND THEIR MAJOR TRIBUTARIES

During 1997, River Habitat Surveys were conducted in a total of 196 sites. The presence or absence of Japanese Knotweed (*Fallopia japonica*), Himalayan Balsam (*Impatiens glandulifera*), and Giant Hogweed (*Heracleum mantegazzianum*) was recorded in each 500 m site. These species are considered to be a problem at a national level. The data were classified into three main groups according to land use within 5 m of the bank top: suburban, agricultural and semi-natural.

In each of the three species, land use was found significantly to affect plant distribution ($p=0.001$). The occurrence of *Fallopia japonica* appeared to be associated mostly with suburban sites and its distribution shows a clear relationship with the more highly industrialised regions of the Taff and its tributaries. These results reinforce the idea that *F. japonica* has most likely become naturalised in these areas as a garden escape.

Impatiens glandulifera appears to respond negatively to the effects of agriculture, its distribution being more associated with areas of low input land use (semi-natural).

In contrast to Tiley *et al.* (1996), instead of finding *Heracleum mantegazzianum* to be rare on tilled or grazed habitats, we found a relatively high association between agricultural sites and this species. Further investigation is needed in this respect.

Dr F.H. DAWSON, Mr M. BRACKEN, Ms Z. RANDLE, Mr P. SCARLETT & Ms C. SHIRLEY

ATLAS 2000 – PROGRESS IN BRITAIN AND IRELAND

Maps were exhibited showing the 999 British and 130 Irish Republic squares for which Atlas records had been submitted. The British total increased to 1212 (43% of the total) when the relatively well recorded Monitoring Scheme squares were included. At BRC, the computerisation of the 1962 Atlas data had been completed with the addition of 410,000 records to the database. The increase in records of *Agrostis gigantea* (Black Bent) was shown using a series of maps. Atlas 2000 data from 642 squares had been entered at BRC and the flow of records back to vice-county Recorders for checking and editing was described. A Verification List (a summary of the taxa the Recorder has submitted) and a Discrepancy List (showing records for taxa at BRC that do not appear in the Recorder's submissions and records in a more recent date class) were shown for SS/9.3 in v.c. 5 (Somerset). A county-by-county account of progress in the English vice-counties was also exhibited.

Dr T.D. DINES

PLANTS OF AN EASTERLY DISTRIBUTION NEAR THEIR GEOGRAPHICAL LIMITS IN EASTERN AUSTRIA

In eastern Austria, to the S and SE of Vienna, plants typical of either Eurasia or of the Balkans approach their westerly or north westerly limit. Here, close to the western edge of the great Eurasian steppe-like plain which extends, largely unbroken, from Hungary eastwards through Asia to Manchuria, there occurs a series of low, gently contoured hills. These form a low climatic and ecological barrier which appears to have restricted further westerly migrations.

Many interesting eastern European and Asiatic plants can be found here as well as others usually limited to the northern Balkans. A few of the more interesting of these were illustrated and briefly described. They included:

Himantoglossum adriaticum, *Imula oculus-christi*, *Linaria genistifolia*, *Melampyrum barbatum*, *Orobanche caesia*, *Oxytropis pilosa*, *Polygala major*, *Stipa joannis* and *Verbascum phoeniceum*.

Although some are occasionally found still further west, most are at their geographical limit in eastern Austria.

Dr M.J.Y. FOLEY & Mrs R. BERRY

CAREX VULPINA – MORPHOLOGICAL DIFFERENTIATION FROM CAREX OTRUBAE

Carex vulpina (True Fox-sedge), a plant of wet habitats and widespread in central and eastern Europe, occurs much less frequently in Britain where it has been greatly over-recorded due to confusion with the morphologically similar *C. otrubae* (False Fox-sedge).

Unequivocal identification of *C. vulpina* is best achieved through a combination of characters. Eighteen of these were examined and their taxonomic value in separating *C. vulpina* from *C. otrubae* was assessed. Many upon which emphasis has been placed in the past were found to be unreliable. It was concluded that the distinctive shape and appearance of the cells of the utricles, – ± squarish and papillose in *C. vulpina* and elongated in *C. otrubae*, and the presence of an overlapping border to the ligule in the former species, were the most reliable. Very occasionally, however, even utricle shape was found to be somewhat atypical.

Information was requested regarding British localities for *C. vulpina*.

SOME SPECIES OF CAREX RARE IN NW ENGLAND

Work has been carried out in northern England aimed at investigating the distribution, population sizes and habitat requirements of some of the rare species of *Carex* native to the area. Although the work is not yet complete, some results relating to part of this area (NW England, from the Mersey to the Scottish border and W of the main Pennine line) were shown.

Examples of the regionally rare sedges investigated included: *Carex appropinquata* (Fibrous Tussock-sedge), *C. elongata* (Elongated Sedge), *C. ornithopoda* (Bird's-foot Sedge), *C. ericetorum* (Rare Spring-sedge) and *C. magellanica* (Tall Bog-sedge). It was found that the closely related *C. digitata* (Fingered Sedge) and *C. ornithopoda* (Bird's-foot Sedge) each occurred in several large populations on the limestones of S Cumbria (v.c. 69) but that their precise areas of distribution overlapped at only three localities.

Dr M.J.Y. FOLEY & Mr M.S. PORTER

THE ATLAS FLORA OF SOMERSET

A display to show *The Atlas Flora of Somerset* (1997) by Paul R. Green, Ian P. Green and Geraldine A. Crouch with a special offer to BSBI members of £15 per copy. Copies are still available from I.P. Green, Farwells, Wayford, Crewkerne, Somerset TA18 8QG, at £20, including postage and packing.

Mr P.R. GREEN

THE MILITARY ORCHID IN ENGLAND

The past distribution of *Orchis militaris* (Military Orchid) in the Chilterns was plotted using more than a hundred records from herbaria and old floras, with the highest density in the Reading - Wallingford area. We considered what caused it to die out and suggested that the primary cause was land use changes, arising from the amount of coal coming out of Newcastle. Collectors undoubtedly finished it off in some locations. There are specimens from Reading University and Bolton Museum, including one from Kent, which Dr Francis Rose considers to be *Orchis militaris*.

We displayed Lousley's excited postcard written when he found it and the famous card sent to him when his secret location was discovered.

We then showed how the population waxed and waned. This year, it reached 168, the highest number recorded. BBONT's research with Kew on the recovery programme continues; we look for the elusive pollinator and touch on other rare species to be considered in reserve management.

Mr M.W. HAVERS

DISTRIBUTION AND CONSERVATION OF *HIERACIUM RADYRENSE* (RADYR HAWKWEED)

Hieracium radyrense (Radyr Hawkweed), is a very rare endemic species, recorded from at least three sites in Glamorgan (v.c. 41). In Radyr in 1998, a total of nine plants was found in one garden where it grows on grassy banks and lawns, often in shade. It was not found at the type locality of Radyr Quarry where it was last seen in 1985. At Bridgend, six possible plants were found on an old garden wall but confirmation of identification is required.

Neither the species nor the sites have any legal protection and it could, in the long term, be under significant threat from inappropriate gardening. Seed from Radyr has been sent to the Millennium Seed Bank and plants are being cultivated.

The work has been funded jointly by Cardiff County Council and the National Museum and Gallery, Cardiff.

Dr G. HUTCHINSON & Dr T.C.G. RICH

CAREX DEPAUPERATA (STARVED WOOD-SEDGE) IN SCOTLAND AND WALES

In the Irish National Herbarium at Glasnevin Botanic Garden, Dublin (DBN), there are two Scottish specimens of *Carex depauperata*, one from Forfarshire, (v.c. 90) and the other from a wood above Bonally (v.c. 83). These new records extend its northern limit by over 250 km, and the former casts new light on a doubted D. Don record from woods near Forfar.

In Wales it was collected near Holyhead in 1936 and 1967, but the records have been queried as they seemed unlikely. Explicit details of the original collection, found amongst the correspondence in the archives at the National Museum of Wales, has confirmed the authenticity of the record but we were unable to re-find the plant in late autumn 1998.

Dr A.K. JONES & Dr T.C.G. RICH

GAUDINIA FRAGILIS – THE STORY SO FAR

Progress to date included 'a summary of the arguments for and against native status', updated national distribution maps at 10 km² and tetrad level, distribution maps of frequent associates in Somerset (*Oenanthe pimpinelloides* (Corky-fruited Water-dropwort), *Centaureum pulchellum* (Lesser Centaury), *Blackstonia perfoliata* (Yellow-wort) and *Genista tinctoria* (Dyer's Greenweed)) and quadrat lists from many sites.

Members were invited to express their opinions (and add new records!).

Gaudinia fragilis has now been recorded from 35 km squares post 1/1/87.

Mr S.J. LEACH, Mr D.A. PEARMAN & Mr D.E. GREEN

DISTRIBUTION OF *EROPHILA MAJUSCULA*, *E. VERNA* & *E. GLABRESCENS*

Herbarium specimens have been used to prepare distribution maps of the three *Erophila* species. *E. majuscula* (Hairy Whitlowgrass) is the least common species, collected most frequently in southern Britain and becoming scattered or rare elsewhere. *E. verna* s.s. (Common Whitlowgrass) is the commonest and most widespread species. *E. glabrescens* (Glabrous Whitlowgrass) is not common but is widespread, and may be the commonest taxon in the north and west of both Britain and Ireland.

The importance of herbarium material to botanical research must be stressed to the BSBI membership; there is a huge amount of information which is not being used. Full results will appear in *Watsonia*.

CARDIFF HEDGEROW SURVEY 1998

The Cardiff Hedgerow Survey 1998 was a joint collaborative project between Cardiff County Council and the National Museum and Art Gallery, Cardiff to survey a stratified random sample of 211 hedges in the Cardiff area using the Hedgerow Evaluation and Grading System (HEGS) and the Hedgerow Regulations.

The mean number of woody species in a hedge was 7.2, including 0.93 alien species. Parish boundary hedges were the most species-rich, road/track hedges and farm hedges intermediate, and new hedges the most species-poor. Hedges differed in structure and composition by parish.

Most hedges were assessed as of moderately high to very high ecological value. About 78% of the hedges in the Cardiff area are likely to qualify as 'important' under the Hedgerow Regulations. Cardiff hedges compare well in richness with other hedges in South Wales and are richer than the average for Britain.

Ms J. LEWIS & Dr T.C.G. RICH

ATLAS 2000 – PRELIMINARY RESULTS FOR SOME ALIEN SPECIES

Although the records received for the Atlas 2000 project are not yet sufficiently representative for any firm conclusions to be drawn, they now indicate some of the major changes in the British flora since the *Atlas of the British Flora* was published in 1962. These changes were illustrated by maps of particular alien species, based on data already held at BRC and on records from 642 British 10-km squares received and processed for the Atlas 2000 project. Some species were already almost ubiquitous in 1962 (e.g. *Acer pseudoplatanus* (Sycamore)) and there is little evidence for the increase of others (such as *Crepis vesicaria* (Beaked Hawk's-beard)) which then had well-defined ranges. However, many species show an expansion in range (e.g. *Lysimachia punctata* (Dotted Loosestrife)) and others which were not mapped in 1962 are now frequent (e.g. *Cicerbita macrophylla* (Common Blue-sow-thistle), *Lamium galeobdolon* subsp. *argentatum* (Variegated Yellow Archangel)). There is also considerable evidence for regional differences in the British alien flora.

Dr C.D. PRESTON, Mr H.R. ARNOLD, Mrs J.M. CROFT, Dr T.D. DINES & Mr D.A. PEARMAN

DISTRIBUTION AND CONSERVATION OF TWO RARE ENDEMIC BRAMBLES

Rubus dasycoccus (Thick-berried Bramble) and *R. trelleckensis* (Trelleck Bramble), are rare endemic species. As part of a collaborative study into conservation of critical species with the Countryside Council for Wales, we have been collating information and carrying out field surveys of both species to establish their current status and needs for conservation.

Rubus dasycoccus was found in at least 14 sites in three 10-km squares in v.cc. 34, 35 & 41. It occurs in a broad range of habitats on a range of soils. It appears to be a significant, if uncommon, element of the Archenfield regional bramble flora.

Rubus trelleckensis was found in five sites in one 10-km square near Trelleck in v.c. 35, all associated with forestry plantations on acidic podzols. It appears to have a restricted ecological range.

Mr R.D. RANDALL & Dr T.C.G. RICH

CATALOGUE OF RUBUS SPECIMENS, NATIONAL MUSEUM OF WALES (NMW)

The *Rubus* collection is one of the most important vascular plant collections in the herbarium at the National Museum of Wales. The collections are being documented on the Museum computer system to facilitate production of a full catalogue. Over 9000 specimens have been documented to date and data entry is scheduled for completion during winter 1998.

Mr R.D. RANDALL, Mr R.M. SEWELL & Dr T.C.G. RICH

CRUCIFER AND SORBUS HERBARIA OF T.C.G. RICH NOW AT NMW

The Cruciferae and *Sorbus* herbaria of T.C.G. Rich, collected between c.1981 and 1995, are now permanently housed at the National Museum of Wales, Cardiff (NMW).

The Cruciferae herbarium was the basis for the BSBI Crucifer Handbook (1991) and contains over 1200 sheets of over 150 species from all over Britain and Ireland, as well as some European and African material and the T.B. Ryves *Lepidium* collection. Many of the specimens are heavily annotated with population data for features such as petal and fruit size.

The *Sorbus* herbarium contains 142 sheets largely from Britain with a few sheets from Ireland. *S. lancastriensis*, *S. vexans* and *S. wilmottiana* are new to NMW.

**DISTRIBUTION AND CONSERVATION OF THE TWO RARE ENDEMIC HAWKWEEDS
HIERACIUM CAMBRICUM AND *H. TAVENSE***

Hieracium cambricum (Welsh Hawkweed) and *H. tavense* (Black Mountain Hawkweed) are rare species endemic to Wales.

H. cambricum is known only from three sites in Wales. It is probably extinct at Treorchy (v.c. 41); 38 plants were refound at Llangollen (v.c. 50) (the first time it has been recorded since 1907) and on the Great Orme, (v.c. 49) where it is well known, 75 plants were found scattered along a c. 25% sample of sites along 2.5 km of cliff. At the Great Orme and Llangollen it is a member of the open limestone rock crevice communities, and may have been on basic rock ledges on Pennant sandstone at Treorchy.

H. tavense is restricted to one site in the Upper Tawe Valley, Brecon (v.c. 42). It grows on base-rich ledges of a waterfall where 13 plants were counted by climbing. The only real threat to its survival is a rock fall. Seed has been deposited in the Millennium Seed Bank and is being grown in cultivation.

Dr T.C.G. RICH

LIST OF PLANTS ENDEMIC TO THE BRITISH ISLES

In the British Isles there are currently about 2200 native species including c.230 *Taraxacum*, c.325 *Rubus*, and over 260 *Hieracium* microspecies. Of these, about 480 are endemic to the British Isles (c.20% of the flora). The endemics are composed mostly of critical taxa – *Alchemilla* (1), *Euphrasia* (9), *Hieracium* (149), *Limonium* (7), *Rubus* (220), *Sorbus* (15) and *Taraxacum* (39) – but there are about 10 non-critical taxa and 29 endemic subspecies.

Details of the *Hieracium* endemics are likely to be revised soon, whilst the endemics within *Ranunculus auricomus* agg. and *Ulmus* remain to be described.

Dr T.C.G. RICH, Mr R.G. ELLIS, Dr G. HUTCHINSON & Mr R.D. RANDALL

A NEW ORCHID HYBRID FOR BRITAIN – × *ORCHIACERAS MELSHEIMERI*

On 27th May 1998, my friend and fellow botanist Owen Davis and I obtained permission to visit a site in E. Kent (v.c. 15) where I had, years ago, seen abundant *Orchis purpurea* (Lady Orchid). We found this still to be plentiful in open woodland, together with several plants of *Aceras anthropophorum* (Man Orchid). Amongst these were two striking orchids with long narrow spikes of rather brownish-pink florets. Careful study of these made it quite clear that they were the hybrid, *Aceras anthropophorum* × *Orchis purpurea* (× *Orchiaceras melsheimeri* Rouy).

Photographs were taken which showed the florets of this plant to have spurs 1.0-1.5 mm long. *O. purpurea* has spurs c.3 mm long; *Aceras* has no spur, only a tiny convex 'bump'. The narrow, long labellum segments are bordered with purplish pigmented cells as is often the case in *Aceras* but never in *O. purpurea*.

At the request of the owner of the wood, the location of the site is being kept entirely confidential but it is a private woodland on chalk with open glades among beech, etc.

This hybrid, as far as I have been able to trace, has not been recorded in Britain so far, though it has been rarely recorded on the continent. The hybrid of *Aceras* and *Orchis simia* has, of course, been recorded in Kent. (Bateman & Farrington, 1987, *Watsonia* 16: 397-407).

Dr F. ROSE

REPRODUCTIVE STRATEGIES, DISPERSAL MECHANISMS AND THE GENETIC STRUCTURE OF *TRICHOMANES SPECIOSUM* IN SCOTLAND

A poster was exhibited summarising an investigation appearing in a forthcoming volume of the *Biological Journal of the Linnean Society*.

The genetic diversity of *Trichomanes speciosum* (Killarney Fern) was investigated in south western Scotland, the northern-most limit of the distribution of the sporophyte. Within sites, no variation was revealed by allozyme electrophoresis, even where both generations were growing together. In contrast, diversity was observed among sites, with seven different multilocus phenotypes (MLPs) present in the area. Asexual reproduction of the gametophyte via gemmae is assumed to be the main means of dispersal in recent times, allowing single clones to become widespread, while the overall genetic variability may be attributed to sexual reproduction and spore dispersal in historic times under more favourable climatic conditions. The long-lived gametophyte contains all of the genetic variability present in the area and can be regarded as a valuable 'seed bank'

Dr F.J. RUMSEY, Dr J.C. VOGEL, S.J. RUSSELL, J.A. BARRETT & M. GIBBY

REMEMBERING OLGA STEWART

An exhibit to show the life and work of Olga Stewart

STONEWORT RECORDS IN 1998

1998 has been a very good year for new stonewort records, including the following records for Red Data Book species.

Foxtail stonewort – *Lamprothamnion papulosum* found new to Sussex – a specimen was exhibited.

Baltic stonewort – *Chara baltica* re-found at Hickling Broad; *Chara intermedia* (Intermediate stonewort) (also a Red Data book species) not *C. baltica*, has, however, been causing the problems there for sailors. Baltic stonewort has also been re-found in the Western Isles where it has not been seen since the 1930s.

Bird's nest stonewort – *Tolypella nidifica*, found new to the Western Isles.

Tassel stonewort – *Tolypella intricata* – as a result of a survey funded by Plantlife, the Gloucestershire population is now known from seven colonies; the species has been re-found in Cambridgeshire and Suffolk and new sites have been found in Norfolk and Worcestershire.

Great Tassel stonewort – *Tolypella prolifera* a new site found in Somerset, a second colony at the Cambridgeshire site and re-found at a third site in West Sussex. Again, Plantlife has been involved in survey work for this species.

Slender stonewort – *Nitella gracilis* found new to Ceredigion.

Dr N.F. STEWART

SILENE UNIFLORA (SEA CAMPION) WITH YELLOW CALYCES

Previous reference to *Silene uniflora* f. *marquandii* in Guernsey was given. Photographs and specimens of this form in Sark were presented and it was queried whether this form occurs outside the Channel Islands.

1998 Sark records – records of the following were given, usually with photographs and/or specimens: *Hydrangea macrophylla* (Hydrangea), long standing but not previously recorded.

Pyrus pyraster (Wild Pear) and *P. communis* (Pear), First dated or localised record for any pear since 1896.

Mespilus germanica (Medlar), first record not planted.

Crataegus persimilis (Broad-leaved Cockspurthorn), first identified record.

Oxalis pes-caprae (Bermuda-buttercup), first record as established.

Cuscuta epithimum (Dodder), first record since 1978.

Cortaderia selloana (Pampas-grass), first record outside garden.

Amaryllis belladonna (Jersey Lily), first record outside garden.

Sparaxis grandiflora (Plain Harlequin-flower), first record outside garden.

Dr R.M. VEALL

MAPS SHOWING CHANGES IN THE DISTRIBUTION OF ORCHIDS IN NORTHAMPTONSHIRE (V.C. 32).

A series of dot maps has been created to show the changes in the distribution of woodland and grassland orchids in v.c. 32, using different dots to create different date bands. By bringing together data from herbaria, local societies and naturalists, the two county Floras and data gathered for Atlas 2000, it has been possible to create retrospective maps which show changes in distribution of orchids. The fascination of botanists with orchids makes it easier to accumulate data with localities for older records although often these are difficult to trace as the name used is no longer current. All species showed a decline except for the Bee Orchid (*Ophrys apifera*) and Common Spotted-orchid (*Dactylorhiza fuchsii*) which have found new homes in the former gravel pits and abandoned quarries which are common in the north of the county.

Mr R. WILSON

Other exhibits included: Mr J.D. Briggs: *Mistletoe Survey update*; Dr Y. Christofides: *The orchids of Cyprus*; Mr P. Creed: *The Flora of Oxfordshire and other publications*; Mrs J. Hartley: *BSBI holiday in Cyprus*; Mr S.L.M. and Mrs A.M. Karley: *Help!; British Plant Gall Society*; Dr F.H. Perring: *The Anglo-French BSBI meeting*; Mr W. Simonson: *UK Biodiversity Action Plan species*; Ms W. Taubert: *Aquarelle paintings of endemics and orchids of Cyprus*; Mr A.R. Vickery: *Towards a dictionary of English plant-names*.

AILSA BURNS

STOP PRESS

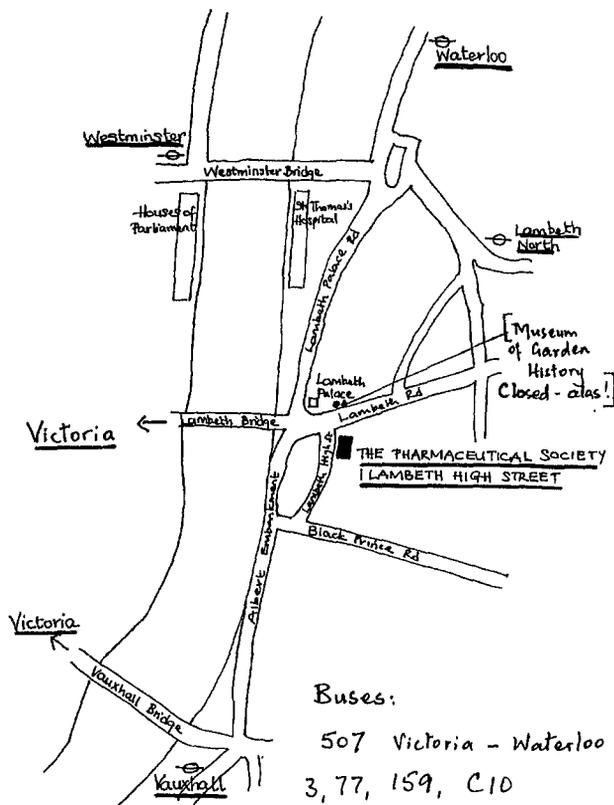
ATLAS OF THE CORNISH FLORA—IMMINENT

We apologise to subscribers for the delayed appearance of the *Atlas of the Cornish Flora* but are delighted to report that its publication is now imminent.

In response to a recent query, Colin French (12 Seton Gardens, Camborne, Cornwall, TR14 7JS) replied that '... if all goes to plan ... we should be sending the completed books out to those that subscribed to the pre-publication offer in about eight weeks (from 15/3/99). I think it fair to say that we completely misjudged just how much work would be involved and I am sorry that it has taken so long and hope that everyone will be happy with the final result.'

As with most local Floras published these days, were it not for the income from the pre-publication offer, publication would not have been possible, as it is that which pays the bills and we thank all subscribers for their patience.

EDITOR



Map showing location of AGM

5th INTERNATIONAL CONFERENCE ON THE ECOLOGY OF INVASIVE ALIEN PLANTS

13-16 October, 1999, La Maddalena, Sardinia - ITALY

Invasions of plant species have for a long time drawn the attention of botanists, agronomist and ecologists. Although this resulted in an ever-increasing body of scientific literature on 'invasion biology' we still do not completely understand all aspects of this process and its impact on ecosystems.

This Conference will offer the chance to continue discussions of its predecessors and concentrate on issues identified as important during preceding meetings.

For registration or further information please contact:

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