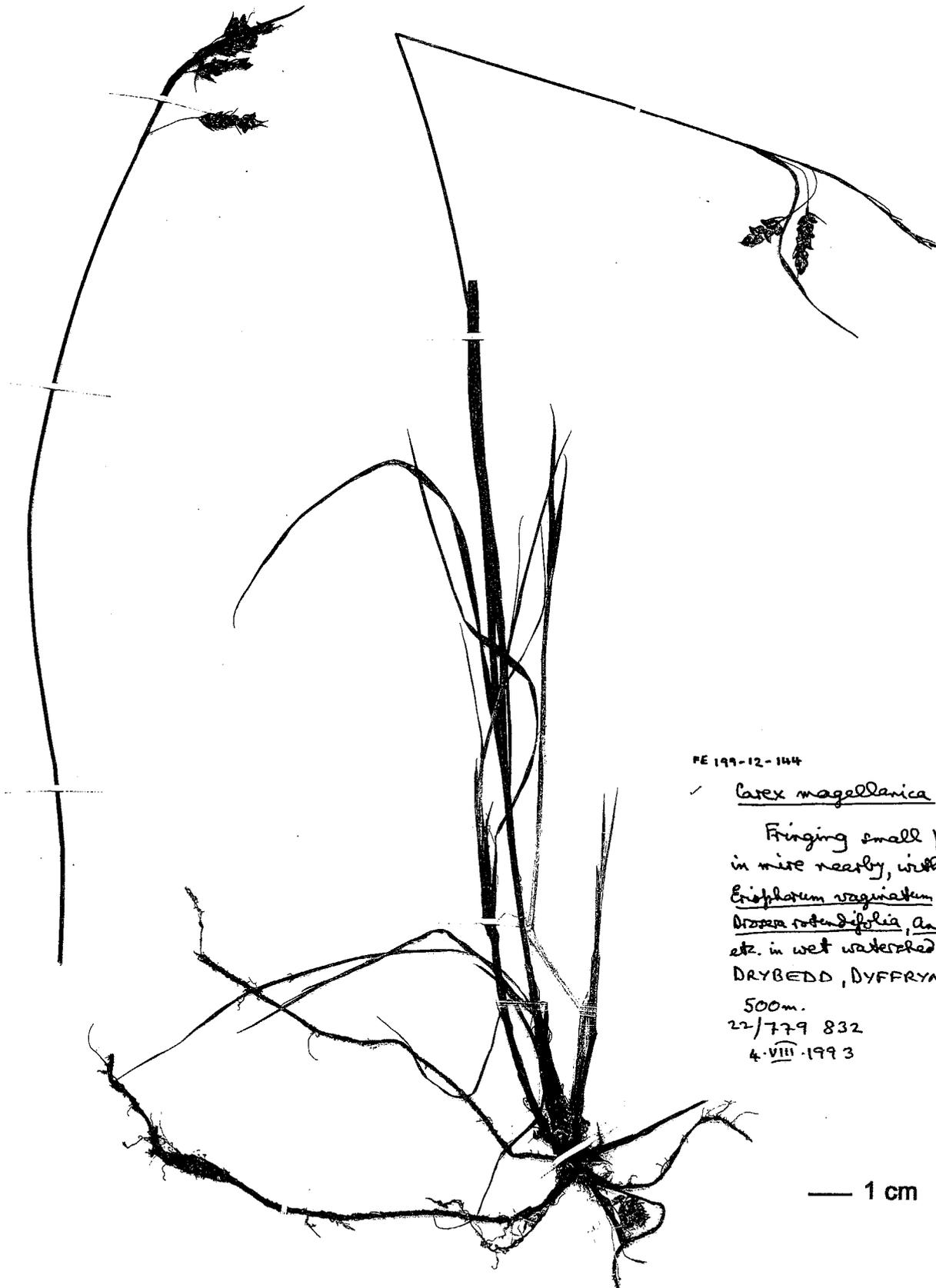


# WELSH BULLETIN

Editor : R. D. Pryce

No. 59, SUMMER 1995



FE 199-12-144

v. 93. 69. 175

✓ Carex magellanica Lam.

Fringing small pool and scattered  
in mire nearby, with C. rostrata,  
Eriophorum vaginatum, E. angustifolium,  
Drosera rotundifolia, Andromeda, Narthecium  
etc. in wet waterlogged mire, 800 m E of  
DRYBEDD, DYFFRYN CASTELL, CARDS.

500m.

22/779 832

4.VIII.1993

V.C.46

A.O.CHATER.

— 1 cm

## CONTENTS

Editorial .....	3
Annual General Meeting, 1994 .....	4
Hon. Secretary's Report .....	4
Hon. Treasurer's Report .....	5
Proposed Amendment to item 5 of the Constitution .....	6
Elections .....	6
Welsh Botanic Garden .....	6
Atlas 2000 .....	6
Exhibits and slides .....	7
Committee for Wales, 1994-1995 .....	7
33rd Welsh Annual General Meeting and 13th Exhibition Meeting, 1995 .....	8
Welsh Field Meetings - 1995 .....	9
Recording in Cardiganshire VC 46 during 1992 - 1994 .....	12
Carmarthenshire Flora Project: Progress in 1994 .....	21

All back issues of the BSBI Welsh Bulletin are still available on request (originals or photocopies). Please send cheque (made payable to BSBI Wales), @ £1 per issue, which includes p & p, to - Dr G. Hutchinson, Department of Botany, National Museum of Wales, Cathays Park, Cardiff CF1 3NP, specifying the issue number, or year (which would have to include the season or month). Large runs - price negotiable.

## EDITORIAL

One function of this Bulletin is to act as a reminder of the imminent Welsh AGM and associated field meetings to be held at the Royal Welsh Show Ground, Builth Wells from 7th to 10th July. Accommodation is still available if you have yet to book.

Two lengthy articles are featured in this edition, describing progress towards the production of floras of two Welsh vice-counties. However, it seems that submission of material for the Bulletin continues to be limited to a very few authors. In fact a quick search through the Bulletins of the last ten years reveals that the publication might be more accurately (if flippantly) christened "The BSBI Bulletin of Carmarthenshire and other parts of Wales!" Caernarfon and Cardigan also feature regularly but, articles relating to other vice-counties, particularly those in North Wales are sadly lacking (a Dafor check-list is reproduced below!). Other topics covered regularly also include species and conservation and, of course, new plant records. I am therefore appealing for contributions from others. Site descriptions and monitoring, progress with recording, conservation and short general articles and letters will all be very welcome: there is ample scope for you to get into print.

35	Monmouth	R
41	Glamorgan	O
42	Brecon	R
43	Radnor	R
44	Carmarthen	D
45	Pembroke	O
46	Cardigan	F
47	Montgomery	R
48	Merioneth	R
49	Caernarfon	F
50	Denbigh	R
51	Flint	R
52	Anglesey	R
	Plant Records	A
	Species & conservation	A

16-22 articles: D; 10-15 articles: A; 6-9 articles: F; 4-5 articles: O; 1-3 articles: R.

Finally an apology to members who in the past have helped with recording for the Carmarthenshire flora and to whom I normally send an annual progress report. I'm afraid that time has overtaken me this year and therefore my report has gone straight into this issue of the Bulletin. I will still be sending copies to participants not living in Wales and who therefore do not receive the Bulletin.

Richard Pryce, Trevethin, School Road, Pwll, Llanelli, Dyfed, SA15 4AL.  
17th June 1995.

## ANNUAL GENERAL MEETING, 1994

The 8th Quadrennial Meeting, 32nd Annual General Meeting and 12th Exhibition Meeting of BSBI Wales was held at Normal College, Bangor, Gwynedd on Saturday July 9 1994.

On the Friday, members staying or living in the area enjoyed an evenings visit to a local site to make the annual count of *Orobanche rapum-genistae*. This was followed by a fascinating visit to Treborth Botanic Garden for coffee and a look at the plant collections, which included some rare Welsh plants in cultivation. On Saturday morning and early afternoon, Nigel Brown led members in exploring a classic glaciated valley near Bethesda and in recording plants for the Caernarfonshire Flora Project, before returning to Bangor for the AGM.

After tea, the Chairman opened the Annual General Meeting. Apologies for absence were received from Stephen Evans, Quentin Kay and Elsa Wood. The minutes of the last AGM, published in the *Welsh Bulletin* No 56, Winter 1993 pages 5-7, were then taken as read and accepted without amendment.

The Chairman, in his opening remarks, welcomed the 40 or so members present and thanked the members of the Committee for Wales and the treasurer and secretary for their help and support over the four years of his term in office which had now come to an end. He also thanked Nigel Brown for organising the AGM in Bangor. He concluded by pointing out that much work still remained to be done in conserving the Welsh flora. Natural habitats were still being destroyed at an alarming rate and some of the schemes under set-aside were almost as disastrous as the loss of hay meadows.

### Hon. Secretary's Report

The Hon. Secretary, Gwynn Ellis, then gave his report on the last year's activities. He commented that the Committee for Wales had remained at full strength throughout the year but the elections to follow would bring some changes.

Three issues of the *Welsh Bulletin* had been issued since the last AGM; nos. 55, 56 & 57. The editor Richard Pryce was again congratulated on the high standard that he had maintained. George Hutchinson was also thanked for his hard work in planning and producing the *Bulletin*. Issue 58 was well advanced and would contain *Welsh Plant Records for 1993* and the order and nomenclature would follow Kent's *List of Vascular Plants of the British Isles* and Stace's *New Flora of the British Isles*. He hoped that members would continue to send in notes and articles for publication in the *Bulletin*. He commented that issue no 57 was the first to be produced outside the National Museum of Wales. Camera Ready copy was prepared by George Hutchinson and the printing carried out by Merthyr Borough Council, at some extra cost but a great saving in labour.

The Secretary then reported that seven field meetings had been arranged in Wales in 1994. The 3 held so far had been well attended and bookings for most of the others were adequate but spaces were still available. David Humphreys was thanked for the splendid programme he had arranged. In 1995 it was hoped to arrange more field meetings; some would be square bashing meetings to help with recording for the Atlas 2000 project; others would be traditionally led meetings to areas of interest. All members were urged to help in the Atlas 2000 project, preferably by taking on one or more hectads (10 km squares) allocated by their vice-county recorder, or by attending field meetings aimed at recording for the project.

The Secretary then remarked that one of the items discussed by the Committee for Wales over the past year had concerned the need for a Welsh Botanic Garden and another was the possibility of privatisation of the Forestry Commission and the related fears that conservation officers would be lost. Concern was also expressed about the possible privatisation of MOD land and it was agreed that we needed to safeguard the conservation interests of all land at present in public ownership.

He then thanked the various organisations that had helped the Society in Wales over the last twelve months, including: the CCW for allowing the Committee for Wales to meet in its offices at Plas Gogerddan, Aberystwyth and Llandrindod Wells; the National Museum of Wales for secretarial assistance, for production of the *Welsh Bulletin*, and for its help in many other ways; The officers and staff of Normal College Bangor for looking after us during the AGM; and finally Nigel Brown for all the hard work he had put into organising the meeting.

The Secretary then reminded members of the field meeting to be held at Newborough Warren the following day, led again by the indefatigable Nigel Brown.

Finally, he reminded members that after the Meeting, two talks would be held, one before and one after dinner. There would also be plenty of opportunity to look at the various exhibits.

### Hon Treasurer's Report

The Hon Treasurer, Richard Pryce, then gave his final report on the financial situation which was again satisfactory. Balance sheets (reproduced below) were circulated. Sales of the *Welsh Bulletin* to English members raised £267.

#### BSBI Committee for Wales Statement of Accounts from 1 January to 31 December 1993

RECEIPTS		PAYMENTS	
	£		£
Bull. subs./back nos.	69.00	Bull. no. 54	125.78
From BSBI Treasurer	0.00	Bull. no. 55	91.03
Ferryside receipts	416.85	Ferryside accom.	404.38
Parc-le-Breos receipts	1792.15	Parc-le-Breos accom.	
1614.00		Lampeter accom.	350.97
Lampeter receipts	362.75	total	2586.16
total	2640.75		
		£	
Carried forward from 1992		202.44	
			257.03
Excess payments over receipts		4.59	
Bank account balance:	deposit	198.71	
			257.03
	current	58.32	

#### Statement of Accounts from 1 January to 8 July 1994

RECEIPTS		PAYMENTS	
	£		£
Bull.subs. / back nos.	267.00	Bull. no. 56 & Index	176.58
From BSBI Treasurer	0.00	Bull. no. 57	99.87
Ferryside receipts	687.95	Ferryside deposit	35.05
Rubus meeting receipts	103.67		
total	£1058.62	total	£311.50
Carried forward from 1993		207.03	
			1004.15
Excess receipts over payments		747.12	
Bank account balance:	deposit	198.71	
			1004.15
	current	805.44	

### Proposed Amendment to item 5 of the Constitution

It was proposed that item 5 of the Constitution be amended as follows: to read as follows: Replace Minutes Secretary in line 4 with Treasurer and Field Meetings Secretary; replace Eight Committee Members in line 5 with Ten Committee Members, and in line 7 replace, four of these with five of these. The reasoning behind these changes was to increase the size of the Committee for Wales to 15. This would bring in fresh blood to the Committee and also provide a larger 'pool' of possible volunteers for those jobs that crop up from time to time. The proposal was unanimously approved by the meeting.

Item 5 now reads (with the 1982 amendment underlined and the 1994 amendments in italics):

The Chairman and Vice-Chairman to be elected to serve for a term of four years and not be eligible for immediate re-election (but they shall be eligible for election to the same office at a later date). The retiring Chairman and/or Vice-Chairman shall be eligible for immediate election to the Committee for Wales. The Secretary, *Treasurer and Field Meeting Secretary* to be elected annually and be eligible for re-election each year. *Ten* Committee Members to be elected to serve for a period of two years, *five* of these to retire each year by seniority, and be eligible for immediate re-election.

---

### Elections

In the elections that followed Paul Day was proposed as the new Chairman and Welsh Representative on Council and Richard Pryce as the new Vice-Chairman, both were elected unopposed and by acclamation.

Paul Day then took the Chair, and, after thanking both Trevor Evans and Richard Pryce, for their sterling service over the past years, he moved on to the election of other officers and committee members.

In accordance with the amended constitution, The Hon Secretary, Gwynn Ellis and Hon Field Secretary, David Humphreys were re-elected unopposed to their respective posts and Dr Peter Jones was elected unopposed to the post of Hon Treasurer.

Stephen Evans, George Hutchinson, Quentin Kay and Goronwy Wynne were due to retire under rule 5 of the constitution and were eligible for immediate re-election and had indicated their willingness to stand again. Because of the change in constitution, three extra members were needed for the Committee for Wales and the Committee nominated Arthur Chater, Trevor Evans and Mike Porter. In the absence of any other nominations from the floor, all 7 were duly re-elected to serve on the Committee for Wales for a further period of two years.

---

### Welsh Botanic Garden

Ray Woods reported on the meeting that had recently been held at Plas Gogerddan Aberystwyth at which the question of a Welsh Botanic Garden had been fully discussed. A letter had been sent to the Secretary of State for Wales, pointing out the BSBI's interest in the project and suggesting that the Society had much to offer and should be involved in any decision making.

---

### Atlas 2000

Following a request under any other business, the Secretary gave a short report on the present state of Atlas 2000. He emphasised that although there were still difficulties regarding finance, Atlas 2000 was going to happen and a start should be made on recording.

In the absence of any other business, the Chairman declared the meeting closed.

---

**Exhibits and slides**

Among the exhibitors were:

Nigel Brown	<i>Hymenophyllum wilsonii</i> in Cwm Perfedd
Ann Conolly	Scarce species in West Lleyn
Trevor Evans	Irish plants
George Hutchinson	<i>Populus nigra</i> subsp. <i>betulifolia</i> rediscovered in
Carms	
	Some urban pavement grasses of Cardiff
Peter Jones	The conservation of <i>Liparis</i> in South Wales
Goronwy Wynne	Some Trees and Ferns (and a Tree-Fern) from
New	Zealand 1993

---

**COMMITTEE FOR WALES, 1994-1995**

Following the election of officers and members at the Quadrennial and Annual General Meeting, the composition of the Committee for Wales is as follows:

**Officers**

Chairman and Welsh Rep. on Council	Mr P. Day
Vice-chairman	Mr R.D. Pryce
Secretary	Mr R.G. Ellis
Treasurer	Dr P.S. Jones
Field Meeting Secretary	Dr D. Humphreys

**Committee Members**

Mr A.O. Chater	Dr G. Hutchinson
Mr N.H. Brown*	Dr Q.O.N. Kay
Mr S.B. Evans	Mrs E.G. Wood*
Mr T.G. Evans	Mr R.G. Woods*
Dr D.R. Humphreys	Dr G. Wynne

\* members due to retire in 1995

---

**BOTANICAL SOCIETY OF THE BRITISH ISLES****33rd WELSH ANNUAL GENERAL MEETING  
AND  
13th EXHIBITION MEETING 1995****Friday July 7th to Monday July 10th 1995  
Neuadd Henllan, Royal Welsh Show Ground, Builth Wells, Powys****Programme****Friday July 7th**

- 6.30 Dinner
- 7.30 Visit to local site

**Saturday July 8th**

- 8.30 Breakfast (collect packed lunch)
- 10.00 Field Meeting - leader Ray Woods - to the NNR at Rhos Goch, the finest raised mire with transitional fens in Mid-Wales. Meet in Rhos Goch village SO/188.477 at 10.00.
- 4.00 Return to Neuadd Henllan for tea.  
Meeting of Committee for Wales.
- 4.30 Annual General Meeting at the WJEC Pavilion on the Show Ground.
- 5.00 Talk by Ray Woods *Conserving Plants - A Diverse Strategy ?* "
- 6.30 Dinner
- 7.30 Talk by Mike Porter *The Flora of Brecknock - the first quarter century*  
Exhibition - Slides - Discussion

**Sunday July 9th**

- 8.30 Breakfast (collect packed lunch)
- 10.00 Field Meeting - leader Ray Woods - to an upland site in the area. Residents leave Neuadd Henllan at 9.45. Meet at Abergwesyn village, SN/853.526, at 10.30. with species rich upland meadows, then to Nant Irfon NNR, with woodland, flushes and grassland. Take packed lunch.
- 6.30 Dinner

**Monday July 10th**

- 8.30 Breakfast  
Optional ( but very welcome ! ) recording in v.cc. 43 and 42  
Contact David Humphreys for sites and cards.

**WELSH FIELD MEETINGS - 1995****SATURDAY 20th MAY  
LIXWM, FLINTSHIRE (v.c. 51)  
Leader: G. Wynne**

A recording meeting for 'Atlas 2000' in SJ17. This could be in small or large groups, and there are a variety of habitats, acid or limestone, wet or dry. Collect at the end of the day to discuss findings and records. No dogs please.

Meet at 11.00 a.m. at the chapel at Lixwm, SJ/167.715, on B5121 3½ miles from Holywell.

Please send bookings to Dr D.R Humphreys, Knill Court, Knill, nr Presteigne, Powys LD8 2PR, and not to the leader.

**FRIDAY 2nd to MONDAY 5th JUNE  
LLANDOVERY, CARMARTHENSHIRE (v.c. 44)  
Leader: Mr R.D. Pryce**

A meeting to record in under-worked areas of eastern Carmarthenshire for ATLAS 2000 and the Carmarthenshire Flora Project. Both upland and lowland areas will be included and participants will be divided into small groups in order to cover as much ground as possible.

The meeting will be based at the highly acclaimed Llwyn Celyn Guesthouse on the western outskirts of Llandovery (SN/760.347). It is situated on the north-west bank of the River Tywi adjacent to the A40 road and is within easy walking distance of Llandovery (BR) station. Approximate cost of the weekend's accommodation in either single or double rooms is expected to be about £90 per person and will include bed, breakfast and evening meal from Friday dinner to Monday breakfast. Non resident participants will be welcomed and the excellent evening dinners will be available at Llwyn Celyn for £11.75.

All seven available rooms have been provisionally reserved but it is essential that you book **NOW** so that extra costs are not incurred should some rooms remain vacant. **Please send bookings IMMEDIATELY** to Richard Pryce, Trevethin, School Road, Pwll, LLANELLI, Dyfed, SA15 4AL enclosing a deposit of £10, or phone 01554 775847.

**SATURDAY JUNE 17th  
KENFIG DUNES NNR, GLAMORGAN (v.c. 41)  
Leader: Mr P.S. Jones**

This meeting will focus on the immensely rich and varied flora of this well-known dune system. A number of the Kenfig specialities will be seen during the day, including the nationally rare *Liparis loeselii*. However a main objective for the meeting will include recording of some of the less well-known parts of the reserve as part of the 'Atlas 2000' project. It is hoped that some time will be spent searching for some of Kenfig's long lost plants such as *Herminium monorchis*, *Coeloglossum viride*, *Radiola linoides* and *Limosella australis*.

Numbers will be limited to 25. Waterproof footwear and clothing is advised, but the terrain will be gentle. Meet at the Nature Reserve Centre car park at SS/802.810 at 11.00 a.m.

Please send bookings to Dr D.R Humphreys, Knill Court, Knill, nr Presteigne, Powys LD8 2PR and not to the leader.

**SATURDAY JUNE 24th**  
**PENYRERYD, GWBERT, CARDIGANSHIRE (v.c. 46)**  
**Leader: Mr A O. Chater**

A meeting to explore the sand dunes and sea cliffs at the mouth of the Teifi estuary, with a wide variety of native and alien species.

Meet on B4548 road alongside estuary at SN/166.483, 2 km NNW of Cardigan, at 11.00 a.m. Terrain fairly easy.

Please send bookings to Dr D.R Humphreys, Knill Court, Knill, nr Presteigne, Powys LD8 2PR, and not to the leader.

**SATURDAY JULY 1st**  
**LLANARMON, DENBIGHSHIRE (v.c. 50)**  
**Leader: Mrs J.A. Green**

A Field Meeting to record for the new Atlas. Meet near the Church at Llanarmon Dyffryn Ceiriog at SJ/158.328 at 11.00 a.m. This is on the B4500 15 miles WSW of Chirk. From here we will divide into groups, depending on numbers, to record in SJ13.

This 10 km square has 298 species so far recorded, and has woodland, river valley, upland wetland and 'Roman camp' hilltop. Bring packed lunch and boots, and meet again at 4.00 p.m. to discuss findings.

Please send bookings to Dr D.R Humphreys, Knill Court, Knill, nr Presteigne, Powys LD8 2PR, and not to the leader.

**FRIDAY 7th to MONDAY 10th JULY**  
**BUILTH WELLS, RADNORSHIRE (v.c. 43)**  
**(in connection with the Welsh AGM and Exhibition Meeting)**  
**Leader: Mr R.G. Woods**

This meeting will be based on the Neuadd Henllan Residential Centre on the Royal Welsh Show Ground at Builth Wells. There will be dinner and a short local visit on Friday evening. On Saturday there will be a Field Meeting to an important site in Radnorshire, followed by the Welsh Annual General and Exhibition Meeting and talks. There will be another Field Meeting on Sunday, and opportunity to do recording to update county records and for the new Atlas after departure on Monday morning.

Further details of accommodation will be available later, but there will be some double and single rooms, at approximately £34.00 per night, full board. The meeting is also open to non-residents and day visitors. Booking forms and later information from Dr D.R Humphreys, Knill Court, Knill, nr Presteigne, Powys LD8 2PR, and not to the leader.

**SATURDAY AUGUST 5th**  
**DEVIL'S BRIDGE, CARDIGANSHIRE (v.c. 46)**  
**Leader: Mr A.O. Chater**

A recording meeting for separate small groups to record tetrads in the largely afforested valleys of the Afon Merin and Afon Rhuddnant, with access along forest roads by permission of Forest Enterprise. Meet at The Arch picnic site SN/765.756, 2.5 km ESE of Devil's Bridge at 11.00 a.m. Terrain easy or difficult according to choice.

Please send bookings to Dr D.R Humphreys, Knill Court, Knill, nr Presteigne, Powys LD8 2PR, and not to the leader.

**SATURDAY AUGUST 12th**  
**BEACON HILL, RADNORSHIRE (v.c. 43)[35]**  
**Leader: Mr R.G. Woods**

A meeting to explore the uplands and fringe valleys of a newly-created Nature Reserve of the Radnorshire Wildlife Trust, and possibly another nearby valley depending on the weather conditions. Meet near Beacon Lodge, SO/190.749. Access is from the road from Llagunllo to Knucklas, about 0.8 km N of Llangunllo station, by a 'white road' leading NW from SO/206.738. Continue on this track for just over 2 km to beyond the forested area on the south.

Please send bookings to Dr D.R Humphreys, Knill Court, Knill, nr Presteigne, Powys LD8 2PR, and not to the leader.

**SUNDAY SEPTEMBER 3rd**  
**CWM SELSIG and BLAEN-Y-CWM, MID-GLAMORGAN (v.c. 41)**  
**Leader: Mr P.S. Jones**

The main objective for this meeting will be recording for the 'Atlas 2000' project. A variety of habitats to be examined will include reclaimed coal tip, stream and riverside, flushed hillsides, dry and acid grassland and acid rocks and waterfalls. *Circaea alpina* was recorded in 1890, but has not been seen since in this under-recorded area. There is scope for the party to split into two groups to also examine the corrie cliffs above Llyn Fawr to the north where there are past records for *Orthilia secunda* and *Galium boreale*. Please get in touch with the leader if you have a preference

The meeting will be strenuous and stout waterproof mountain footwear and clothing will be essential. Hazardous cliffs are present at the site, and the course of the walk may pass beneath these.

Meet at the bus park at Blaen-y-cwm off B4522, at SS/918.986, at 11.00 a.m., where arrangements have been made with the Rhondda Countryside Service for reasonably secure parking.

Please send bookings to Dr D.R Humphreys, Knill Court, Knill, nr Presteigne, Powys LD8 2PR, and not to the leader.

---

### Recording in Cardiganshire VC 46 during 1992 - 1994

As the period under review is three years, only a very selective account of what has been done can be given here. Alongside general tetrad recording, several major projects have been taking place in the VC. The Mid-Wales Metal Mines survey run by the Dyfed Wildlife Trust included all significant mine sites in Cards. CCW's Phase I survey has now covered a good deal of the VC, and the Phase II grassland survey has done most of the grassland SSSI's and a number of other good sites. A CCW survey of selected lakes in mid-Wales also produced useful records. As usual though, several other surveys by various organisations, mostly done without any reference to the County Recorder or, apparently, to any competent botanist, produced records which, if they were allowed to get into the system, would create widespread confusion and error. Consultancies must learn that it is not in their own interest, let alone anyone else's, to treat botanical records like industrial secrets; unless they take advantage of recorders and referees, as the rest of us do, they will as often as not end up discredited and with egg on their reports.

Since my last review for 1990 and 1991 (Chater 1992) *Scarce Plants in Britain* (Stewart et al. 1994) has been published and it seems best to start with comments on some of the species involved. My pessimistic surmise that *Thlaspi caerulescens* had become extinct was happily disproved when S. P. Chambers found a colony of 6 plants on the banks of the Ystwyth at Llanfarian, SN589779, in July 1992. This colony has held its own since. *Rhynchospora fusca* is also doing much better than previously thought. In 1992 S. C. Shaw found three colonies with a total of c.410 spikes in old peat cuttings in roughly the area of Cors Fochno NNR where P. D. Moore last saw it c.1965. Then in 1993 M. Bailey and A. D. Hale of CCW found 738 spikes in 6 pools in the north-west part of the bog in land recently added to the NNR. These pools were dug in 1991, and in 1994 a total of 2784 spikes were found in 8 of them. Meanwhile none were seen in Shaw's site in 1994. The species clearly responds well to active management. *Viola lactea* is another species thought to be extinct in Cards, but in June 1992 R. P. Bray found one plant at the boundary of wet heath and improved pasture on National Trust land north-east of Oakford, SN 463588. This has not been seen again in spite of repeated searches, but in September 1994 AOC, J. Turner and J. P. Woodman found two colonies of either *V. canina* or a hybrid with *V. lactea* (the flowers were over) in recently burnt heathy pasture in the Rhos Cwmsaeson SSSI nearby, SN460587.

Following up an old record of *Festuca arenaria* based on a specimen in NMW collected by C. E. Hubbard in 1929 at "Borth towards Ynyslas", AOC found that it was present in small quantity at the seaward edge of the Ynyslas dunes, just inside and just outside the NNR. It proved impossible to distinguish in the field from *F. rubra* without sectioning the leaves. Another old record of a scarce species however was not refound. A. P. Fowles found a note in an entomological notebook of the entomologist Claude Morley for 14 June 1939 (in the Ipswich Museum) about *Impatiens noli-tangere*, to the effect that "one strong bed...was found growing in a gully at Capel Bangor". Morley knew the plant well as the foodplant of the Netted Carpet Moth, which he did not find at this particular site. In August 1993 AOC found *Carex magellanica* at the edge of a small pool in its typical situation of a watershed mire (pH 4.2), with abundant *Andromeda*, on the southern part of Pumlumon,

SN779832; this was the first record for the VC and is the southernmost site in Britain.

Several valuable new sites for scarce species already present elsewhere in Cards. have been found, notably: *Hypericum undulatum* in September 1993, 3 km south of Llanilar, SN628721, by S. Morley on Phase I; *Elatine hexandra* in July 1993, Llyn Maesllyn, SN693627, by AOC and C. Moscrop; *Asplenium septentrionale* in July 1992, Llechwydd-helyg mine, SN684848, by J. A. Martin on the Metal Mines Survey; and *Orobanche rapum-genistae*, several places in the Ystwyth Valley just below Llanilar, SN67, by A. C. Williamson, J. P. Lyons and SM, and in June 1993, Tan-y-bwlch, SN581790, (where Salter first recorded it in 1904) by A. Moorby on Phase I. *Moenchia erecta*, not seen since 1941, was found in abundance in May 1994 on a dry slope near Llanrhystud, SN534703, by JT and JPW on Phase II; AOC had walked over this very site on a *Moenchia* hunt a fortnight earlier! *Luronium natans* was surveyed in several of its localities by R. A. Jones of CCW, and L. Carvalho on CCW's mid-Wales lake survey found lawns of non-flowering rosettes in deep water in Llyn Hir, SN789676, as well as Llyn Fanod, SN603644. As these are natural lakes, not or very rarely subject to drastic lowering of water levels, this suggests that these and the lawns of *Luronium* reported by AOC from bare peat in Llyn Teifi (a reservoir) in 1989 (Chater 1990) are likely to be a permanent feature and not just a population germinated in response to exposure of the reservoir or lake bed.

Two significant records of scarce species came too late for inclusion in the publication. AOC found *Atriplex longipes* along a 100m stretch of *Juncus maritimus* against the sea wall of the Dyfi estuary, SN620936, in September 1993, but assumed it was just a form of *A. x gustafssoniana* (which grows there too) until J. R. Akeroyd was shown a specimen in 1994; the only other Welsh records are from the south. In September 1994 AOC and SPC found 4 plants of *Erodium moschatum* at the edge of the road in Llangranog village, SN312541, the only other definite record being from near Aber-porth in 1941.

Non-native populations of several RDB species native elsewhere in Britain have recently been found or refound in Cards and are of some local interest. *Campanula persicifolia* has a flourishing colony on the banks of the Afon Einion at Ynys-hir, SN684958 (AOC, 1993). *Matthiola incana* was found in September 1994 by AOC and SPC to be still abundant on the roadside bank near the beach at Llangranog, SN311541, where Salter knew it before 1935, and AOC found it well-naturalised among *Lycium* on grassy shingle at Borth, SN608891, in April 1993. *Crocus vernus* is abundantly naturalised in graveyards throughout Cards. *Marrubium vulgare* has clearly decreased since Salter's day, but there is still at least one plant extant, growing in the deserted farmyard of Pen-y-graig, SN363579 (AOC, 1992); this is now National Trust property and we can hope that this interesting relic will be preserved. Although not considered native anywhere, the Tenby Daffodil, *Narcissus pseudonarcissus* subsp. *obvallaris* has been said on at least two occasions to occur in Cards (Vaughan 1967, D. Jones 1992), but there had been no localised records until 1994 when AOC visited all the churchyards and many of the chapel graveyards in March, and found it well-naturalised in 17 sites. Particularly good colonies are in Llanwenog, SN494455, and Tremaen, SN235486, churchyards, Hawen chapel

graveyard, SN346468, the slope above the A487(T) at Banc y Warren, SN204476 (where AOC and JRA first found it naturalised), the south hedgebank of the A482 just west of The Woodlands, Ciliau Aeron, SN509586, and a large colony in blackthorn scrub in the corner of a field near Trefenter, SN612701, 200m from the nearest habitation.

On a visit to the VC in April 1991, A. C. Jermy with AOC had found the gametophyte of *Trichomanes speciosum* in several sites, and it has now been seen in a total of 21 sites throughout Cards, from almost sea level to 320m, above sea level. Usually in dark, dry rock cavities on the north-facing slopes of steep valleys, it has also been found in crevices of open west-facing upland cliffs, and in one site on low cliffs in the open in a coastal dingle, shaded only by ferns in mixed woodland, where it forms felt-like mats 1-1.5 cm thick and up to 40 x 20 cm in extent on the vertical rock faces.

Among higher plants, the records of ferns were the chief novelties from the Metal Mines Survey, and two unexpected calcicoles were recorded new for the VC. *Asplenium trichomanes-ramosum* was found at Esgair-fraith mine, SN741912, in a wheelpit and in several shafts on natural rock as well as on mortared walls, by SPC and JAM in 1992. *Gymnocarpium robertianum* was found at Mynach Vale mine, SN772775, by D. K. Reed in 1993; there were 5 separate colonies with a total of c.400 fronds, growing mostly on mortar-rich gravelly soil in clearings in a conifer plantation. As with the previous species, the size of the population suggests that it has been there for some time. SPC's meticulous investigations of fern hybrids led him to find two new for the VC: *Polystichum x bicknellii* in a wheelpit at Esgair-hir mine, SN727910, in 1994, growing with both parents (*P. aculeatum* is very rare in north Cards); and *Dryopteris x mantonii* on the walltop of disused buildings at Bwlch-glas mine, SN710877, in 1994. The Esgair-fraith/Esgair-hir mine complex with 21 species and hybrids turns out to be even richer in ferns and fern-allies than Cwmsymlog mine, an SSSI, which has 15. *Cryptogramma crispera* was also found at Esgair-fraith in 1992, and in 1993 DKR found one plant on north-facing scree by the Cwmystwyth mine, SN803742. SPC found *Botrychium lunaria* at Glog-fach mine, SN746708, in 1993 (it was already known from two other leadmines), and *Ophioglossum vulgatum* at Glog-fach and near Dyffryn Castell mine, SN786821 (it too was already known from two mines).

*Ophioglossum vulgatum* was recorded by the Phase I surveyors, P. Dalley, A. Moorby and S. Morley in no fewer than 8 new sites, chiefly in grasslands along the coastal slopes north of Llanrhystud; the early start to their field season undoubtedly enabled them to spot it more easily before it was overtopped by other vegetation. JT and JPW also found it in several unimproved pastures above Llanfair Clydogau in 1994, along with *Botrychium lunaria*, and SM found the latter on the Mynydd Bach above Trefenter.

Arable weeds continue to attract a lot of attention in Cards. The cereal species involved were recently written up (Chater 1993), and the only significant novelty since then has been the discovery in 1993 by SPC of *Avena sterilis* subsp. *ludoviciana*, new for the VC, on a manure heap on Welsh Agricultural College trial plots near Lovesgrove, SN634811. In August 1993, a BSBI Field Meeting was held

in Mr. Martin Evans's fields at Tygwyn, Mwnt, where a total of 61 weed species have now been recorded. No fewer than 7 taxa of *Fumaria* occur, and new species recorded there since 1991 include *Ranunculus parviflorus*, *Lamium amplexicaule* and *Urtica urens*. Maize is becoming an increasingly popular crop in the Cardigan area in recent years. It is not harvested until November when it is cut for silage, and this allows a number of weed species to grow to maturity and set seed in a way they are unable to do in crops that are harvested earlier. In the Autumn of 1992 AOC found that the maize fields of Oernant Farm, Penparc, were much the richest in the area. Most spectacular was *Datura stramonium*, gigantic plants of which caused considerable problems to the farmer when it came to harvesting. *Solanum nigrum* subsp. *nigrum* was dominant in several fields; again the plants were huge, mostly 100-130 cm tall (one reaching 143 cm), presumably because of the slurry used as a fertiliser. An *Amaranthus* was abundant here, and this was after much trouble identified by T. B. Ryves, E. J. Clement and C. C. Townsend as *A. x ozanonii*. Neither parent was found, and how this hybrid came to be present in such quantity remains a mystery. The only other *Amaranthus* records from Cards are one of *A. retroflexus* on the Aberystwyth tip in 1928 by Salter, and one plant found in North Road, Aberystwyth, in 1994 by AOC (apart from an unidentifiable seedling at Mwnt in 1987, which was eaten by a slug before it could be grown on).

The status of arable weeds and other species growing on reconstructed roadside verges and slopes can be difficult or impossible to determine. In some cases they are clearly derived from a long-buried seed-bank, in other cases they are clearly part of, or contaminants in, deliberately sown seed-mixtures, but often there is no evidence either way. A few plants of *Erysimum cheiranthoides*, new for the VC, along with *Thlaspi arvense*, not seen in the VC since 1932, appeared in 1992 and 1993 along the reconstructed verges of the A44(T) by the National Eisteddford site at Lovesgrove, SN631811. The *Thlaspi* was also found among Rye-grass on a reseeded railway embankment at Aberystwyth, SN582810, where it was obviously a contaminant, by AOC in 1993; and in a strawberry field above Rhydyfelin, SN606771, obviously not sown, and not seen on previous visits in 1991 - 1993, by SPC in 1994. AOC found one plant of *Crepis tectorum* on the reconstructed and reseeded verge of the A485 near Pont Trecefel, Tregaron, SN674592, in 1992, presumably a contaminant. SPC found a plant of *Vicia sativa* subsp. *sativa*, the only definite record for some decades, on a reseeded slope below the A44(T) at Glanyrafon Bridge, SN609805, in 1994, along with several plants of *Parentucellia viscosa*, only the second record. Were these contaminants, or was the *Vicia*, at least, a relic? Also in 1994 J. Lewis and J. Harvey reported *Parentucellia* in vast abundance over several acres of reclaimed leadmine spoil at Goginan, SN689815. This spoil was landscaped and reseeded in 1989 and has not been disturbed since. It has been visited annually by AOC (chiefly to monitor the *Lotus corniculatus* var. *sativus* sown there), and was visited by the metal mines team in 1992, and if *Parentucellia* had been there in any quantity it could scarcely have been missed. How it has suddenly appeared in such abundance is another mystery. *Agrostemma githago* was found by AOC in 1992 on disturbed ground at the Glanyrafon Industrial Estate, SN609801, where it looked as though it had come up from a buried seed-bank, but in 1994 a lot more of it nearby had obviously been sown with a seed-mixture as it was growing with the alien *Anthemis austriaca* (see Philp 1992).

*Polygonum rurivagum* has been recorded from several new sites. AOC found it on the new verges of the Cardigan bypass, SN188468, in 1992, and he and L. Gander found it in a fallow field near Llechryd, SN217445, in 1993, along with *Mentha arvensis* in perhaps its only extant site in the VC. Most surprising though was to find it an abundant and in places the dominant weed in trial plots at the Welsh Plant Breeding Station (IGER), SN621842 etc. in 1992. *Valerianella carinata* still persists at Aberystwyth railway station, and SPC found single plants of it at Waun Fawr, SN606820, in 1993, and at Penparcau, SN592799, in 1994; AOC found a colony of c.60 plants of it on the gravelly track by the ford by the Ynys-hir road bridge, SN684958, in 1994. *V. dentata* is by contrast an arable weed rather than a casual in VC46, and AOC found a new site for it in a barley field near Felin-wynt, SN227498, in 1992.

Among many first VC records of casuals were *Stachys annua*, one plant found by JPL in 1994 on wasteground used as a car park opposite the new Police Station in Aberystwyth, SN587812, *Linaria triornithophora*, one plant found by AOC in 1993 on the disused part of the refuse tip below Pendinas, SN584799, according to E. J. Clement the first British record; and *Cynoglossum amabile* and *Crepis rubra* on ground disturbed for road-widening at Penrhyn-coch, SN641840, found by AOC in 1993. New VC records of naturalised non-native species were numerous and only a few can be mentioned. SPC found *Oenothera fallax* on the disused railway line at Llanfarian, SN591778, in 1992, and *O. glazoviana* x *biennis* as a hybrid swarm on the Pendinas tip, SN584799, in 1994. AOC noticed in 1993 a large tussock of *Cortaderia richardii* on the gorse-covered slope above this tip, and with 26 inflorescences it must have been there for many years. Unlike the dioecious *C.selloana*, naturalised in a number of sites in Britain, this species has the plants either female or bisexual and seems not to have established itself in the wild anywhere else in Britain (although it self-seeds very successfully all over my garden). In May 1993, Gwyn Jones noticed an unfamiliar plant on the roadside at Cwmyrolchfa near Bronant, SN640688, and this turned out to be the first record for Wales of *Geum macrophyllum*. It is abundant along 30m of the roadside banks and verges, and for 130m up the wooded dingle of the Afon Wyre above the bridge here. The owner of the site has known the plant here for over 40 years. *Azolla filiculoides* has at last reached Cards, SPC finding it in 1993 in a ditch in the Clarach Valley, SN603838; it later proved to be abundant in ditches along much of the valley. R. J. Williams also found it in a farm pond near Synod Inn, SN392550 in the same year. J. N. Davies has since reported it from several garden ponds where it was presumably planted. *Lemna minuta* was found in a garden pond at Cenarth, SN266417, in 1992 by AOC, where it had arrived by unknown means about 7 years earlier and had resisted all efforts by the unfortunate owner to exterminate it (it had smothered her goldfish). *Myriophyllum aquaticum* is becoming widespread in garden ponds and is naturalised in several wild sites, and *Elodea nuttallii* is gradually increasing in ponds and in the Afon Aeron. In spite of optimistic statements in my previous reports, *Crassula helmsii* has in fact resisted repeated attempts to exterminate it from the pond in the Ynys-las Dunes NNR where it has now survived in small quantity for 9 years, and in 1994 MB found it had spread to willow carr nearby. It occurs in many garden ponds (including CCW's own new pond outside their office at Plas Gogerddan) but has nowhere else got out into the wild. *Nymphoides peltata* is another aquatic on the move here, and I. S. Francis found it in 1992 in a ditch by the

Brimstone Wildlife Centre at Penuwch, SN609630, and ISF and AOC found it in the same year in the Afon Aeron at Winllan, SN567573, where it had spread from a garden pond. An interesting second VC record was of *Tolmiea menziesii* frequent in mixed woodland by a ruined cottage site in Cwm Wyre, SN558699, by JND in 1994.

New records of naturalised shrubs include *Symphoricarpos x chenaultii*, established on the streambank below the road bridge at Llanilar, SN623751, found by SPC in 1992 (there is a hedge of it at Glanyrafon farm nearby, as well as bushes in several places in the village); several *Cotoneaster* species including *C. affinis* which is dominant in hedges and widely self-sown by Ty-rhos, 1 km south of Plwmp, SN371513, where it was first collected by Marion Evans in 1978 although the specimen in NMW was not identified until J. Fryer saw it in 1993; *Vitis vinifera* found by AOC in 1992 established in scrub by the Afon Rheidol at Penparcau, SN590806; and *Escallonia macrantha* found by AOC on a cliff by the mouth of the Afon Ystwyth, SN580806, in 1993, in a very similar ledge above the Afon Aeron by the A487(T) bridge, SN458628, in 1994, and by SPC in Aberystwyth station yard in 1994. Two species very rare nationally were *Hypericum forrestii* new to Wales in an old leadmine leat in mixed woodland by the Afon Ystwyth below Pontrhyd-y-groes, SN725721, found by AOC in 1994; and *Salix eriocephala*, known from only 2 or 3 sites in Britain, two colonies of which were found by SPC and AOC in *Molinia* on the Afon Ystwyth bank at Llanfarian, SN588778, in 1992. Enquiries revealed that these colonies had spread from plants put there in 1973 by J. Corfield of the UCW Botanic Garden to prevent erosion of the riverbank.

The discovery that the RDB species *Rorippa islandica* is widespread along the floodplain of the Afon Teifi has been written up (Chater & Rich 1995). Since this work AOC has found several more sites on the Teifi. *R. palustris* too was known only from the Teifi, but in 1994 ADH found a small population by a ditch and track in the north-west part of the Cors Fochno NNR, SN623928. Another new discovery on this NNR was *Frangula alnus* in the Gwynfryn carr, SN642914, by JPL, ASW and MB in 1994; it was previously known as a native only further north-east near Penrhyngerwin and Ynys-hir. Two records of another shrub of wet sites are of particular interest: a colony of *Salix repens* on a flushed heathy slope 1.5 km east of Eglwys-fach, SN702956, found by R. Bamford in 1994, is var. *argentea*, the dune-slack form found at Ynys-las and not known elsewhere in Cards; and also in 1994 AOC and ADH refound on the Cors Caron NNR, SN706666, a colony of very distinct var. *fusca*, recorded here by H. A. Hyde in 1936 and otherwise apparently confined to the East Anglian fens.

A sidelight of the *Rorippa* survey was the discovery that *Callitriche brutia* was frequent all up the Teifi, chiefly in winter-flooded hollows and ox-bows and often with *Rorippa islandica*. *C. brutia* was also found at the Teifi Pools by AOC and RAJ in 1994, on exposed peaty mud by Llyn Teifi, SN787679 (where it had been recorded, as *C. intermedia* var. *pedunculata* by Burkill & Willis in 1894) at 405m a.s.l. and by Llyn Egnant, SN790672, at 425m, unusually high altitudes for this predominantly lowland species. AOC and MB found remarkable colonies of it at nearly sea level on bare peaty soil by ditches at the Aberleri Fields, SN610912, an area recently added to the Cors Fochno NNR. Here it forms circular colonies up to 1.5m in diameter, yellowing and dying away in the centre like fairy rings, whereas similarly large

Another site that seems to produce something new on almost every visit is the Penyregyd SSSI, the sand dune system at the mouth of the Teifi. In October 1993 AOC found 2 minute shrivelled plants of *Lithospermum officinale*, recognisable only by the presence of a few nutlets, on a recently reconstructed sandy slope below the road at SN165484, and more plants have been seen there since. The only other record of this species in VC46 is from this same place by Salter in 1929! *Leymus arenarius* appeared on the beach at this same spot in 1992, presumably from across the estuary in Pembs, and this is now the only native site for the species in Cards. A novelty at the Ynys-las dunes at the other end of the VC, SN610940, was *Erophila majuscula*, found by AOC in 1993 growing 50m or so away from colonies of *E. verna* and *E. glabrescens*.

Good hay meadows are a rare feature in Cards, and perhaps the best example is the one at Winllan, SN566572, owned by the Callans. On a visit in June 1992 AOC found the characteristic hay meadow species *Bromus racemosus* there, the only other post-war record being from a manure heap at Ponterwyd in 1987. Then in 1994 JPW found it in abundance in another hay meadow near Llanrhystud, SN531699.

Among many hybrids recorded new for the VC, in addition to those already mentioned, the following seem of particular interest. *Myosotis x suzae* was found at a muddy, shaded pond margin by AOC in 1993 and confirmed by P. M. Benoit, at The Moat, Llandyfriog, SN342408, and has since been found at 4 other sites; it seems to continue growing and flowering much later in the autumn than its parents and is then much more conspicuous. *Atriplex x gustafssoniana* proves to be abundant in most of the suitable coastal and estuary sites. *Potentilla x mixta*, also unrecorded previously, is widespread, especially on roadside banks. *Euphrasia arctica x confusa* was found on the Llwynmalus mine, SN690679, by SPC in 1993. *Aster x versicolor* was found at the tidal limit of the Cletwr, SN653929, by AOC in 1992. A hybrid between a native and an introduced species, *Alnus x pubescens*, has appeared in a mixed wood of the parents by the old station yard at Llanilar, SN628752; AOC found at least 7 young trees of the hybrid in 1992, and this seems to be one of the very few places in Britain where it has obviously arisen spontaneously and not been planted. *Epilobium parviflorum x palustre* was found by AOC and D. P. Stevens in July 1994 on a Phase II meeting at the Rhos Gellie SSSI, SN379536, where it was frequent in *Molinia* fen communities. It was later found in other similar sites and is sometimes at least as abundant as *E. palustre*; the plants have the filiform stolens of *E. palustre* but are large and more branched, with bigger flowers and the stigmas partly quadrifid. *Juncus x diffusus* was found at another SSSI fen site, Banc y Mwidan, SN196483 and 201489, by JPW and AOC in August 1994, and SPC found it the next month at the Coed Madie B. Godard DWT Reserve near Llechryd, SN212440. The stimulus of Stace's *New Flora* has led to the recording of many taxa that we were unaware of or had neglected, especially among hybrids and aliens.

Finally a few oddities: *Wahlenbergia hederacea* has been found in two long-established lawns, at the National Trust property at Llanaeron, SN479601, by J. P. Savidge in 1992, and at Glandyfi Castle, SN692967, by AOC and W. M. Condry in 1994. *Eleocharis quinqueflora* was found in its first upland site in the VC,

in a flush at 320m a.s.l. a north-facing slope east-south-east of Pontrhyd-y-groes, SN752718, by AOC in 1993. In 1994 he found *E.uniglumis* in abundance over several acres of the summer-dry bed of Bog Pond, SN732824; this species is very rarely found inland, and then always in base-rich sites. Here it is 14 km from the sea and at 325m a.s.l., and although no other calcicoles are present and the whole site appears very acidic, the pH of the substrate varies from 5.0 to 6.9. Further investigations are taking place. Also present here is what looks very like *Equisetum x dycei*, but this is still awaiting expert identification. In September 1994 while investigating an ox-bow south of the Teifi 1.5 km east of Cenarth, SN253413, an exclave of VC46, AOC found several plants of *Spirodela polyrhiza*; this was a completely wild site, far from any garden or any other alien species, yet well outside the natural range of the species, and it would seem more likely that this colony derived from plants washed down river in floods from some garden pond than that it is a native population.

Visits by experts have added many species and clarified critical genera, and should be written up separately. Those by D. E. Allen to look at *Rubus* in 1993 and 1994, the collections from which are still being checked, were especially productive. J. Bevan came to look at *Hieracium* in 1994, and 5 new species have been added for the VC in the last 3 years. As well as visits for particular genera, already mentioned, by T. C. G. Rich, A. C. Jermy and R. A. Jones, in September 1994 P. D. Sell and G. Murrell came to Gwbert to study the *Limonium binervosum* agg. populations and also investigated coastal ecotypes of *Hypochaeris radicata*, *Lotus corniculatus*, *Succisa pratensis*, *Cirsium arvense* and other species.

Thanks are due to everyone mentioned above, to other recorders who have sent in records, to many hard-worked referees, and to George Hutchinson and others at NMW who unfailingly provide a much-appreciated back-up service.

### References

- Chater, A. O. (1990). Recording in VC46 during 1988 and 1989. *B. S. B. I. Welsh Bull.* 49: 9-12.
- Chater, A. O. (1992). Recording in VC46 during 1990 and 1991. *B. S. B. I. Welsh Bull.* 53: 19-22.
- Chater, A. O. (1993). *Avena strigosa*, Bristle Oat, and other cereals as crops and casuals in Cardiganshire. *B. S. B. I. Welsh Bull.* 55: 7-14.
- Chater, A. O. & Rich, T.C.G. (1995). *Rorippa islandica* (Oeder ex Murray) Borbás in Wales. *Watsonia* 20: 229-238.
- Jones, D. (1992). *The Tenby Daffodil*. Tenby.
- Philp, E. G. (1992). *Anthemis austriaca* Jacq. again. *B. S. B. I. News* 60: 44-45.
- Stewart, A., Pearman, D. A. & Preston, C. D. (1994). *Scarce Plants in Britain*. Peterborough.
- Vaughan, [I. M.] (1967). Notes on the origin and distribution of *Narcissus obvallaris* Salisb. *B. S. B. I. Welsh Region Bull.* 10: 1-3.

Arthur O. Chater, Windover, Penyrangor, Aberystwyth, Dyfed. SY20 1BJ

## CARMARTHENSHIRE FLORA PROJECT: PROGRESS IN 1994

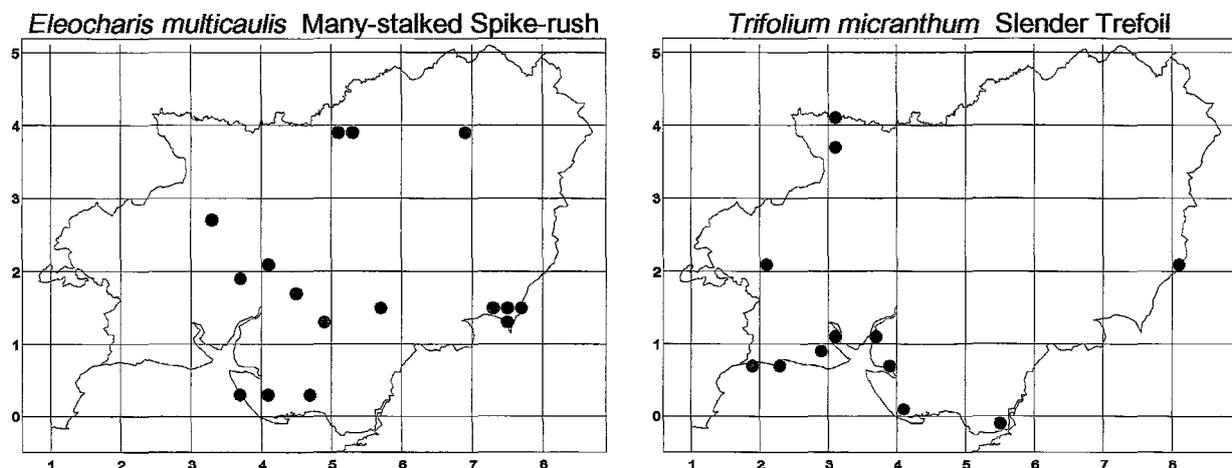
Again this year I have been swamped with data. As usual the main contributors have included Dr. George Hutchinson (GH), Ian Morgan (IKM) and Mary and James Iff (M&JI) but in addition, the Phase I and Phase II survey teams of the Countryside Council for Wales have submitted a substantially increased number of records as they have concentrated this season on Dinefwr and Carmarthen districts. The teams included Sarah Andrews (SA), Morfydd Lloyd (ML) and Richard Howorth (Phase I) and Jamie Bevan (JMSB) and Graham Motley (GSM) (Phase II). The other major contribution of records was, of course, from the weekend recording meeting which is now established as an annual event.

### Early Spring Records

IKM reported his discovery of *Galanthus nivalis* flore pleno (the double form of Snowdrop) being well established in "The Wilderness" area of Stradey Woods (SN489013) in early February, a relict of a former garden, now being restored. IKM also made by several records of *Prunus cerasifera* (Cherry Plum), native to the Balkans and into south-west Asia, conspicuous by its early flowering (maybe three or four weeks before *P. spinosa* (Blackthorn)) - a large bush opposite Soar Chapel, Llwynhendy (SS542997) and also planted along the Hendy Link Road between Llangennech and Dafen (SN50).

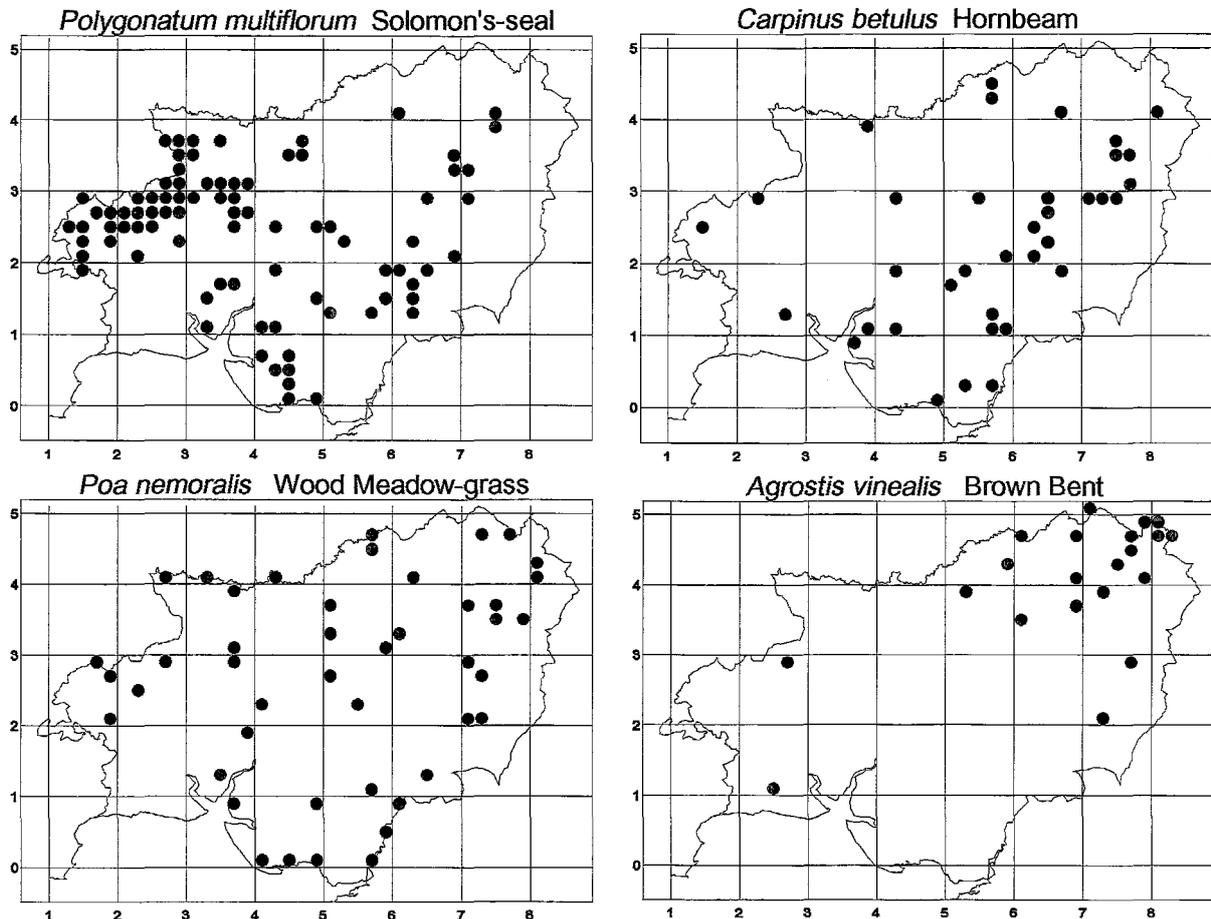
### Ferryside Recording Weekend

The annual recording weekend at the beginning of July, based in Ferryside, was attended by several familiar faces and concentrated on underworked areas in the north-west of the vice-county. John Killick and Jim Bevan recorded *Carex pulicaris* (Flea Sedge) and *Eleocharis multicaulis* (Many-stalked Spike-rush) as part of a



diverse species assemblage from a valley mire 200m south of Pencaerau Mill near Talog (SN334270) and *Trifolium micranthum* (Slender Trefoil) from near Castell Draenog (SN22A), all new 10km square records. They also found *Carum verticillatum* (Whorled Caraway) and *Scutellaria galericulata* (Common Skullcap) from Llwyncrwn in the Fenni valley (SN235183), both new tetrad records. John had earlier recorded *Carpinus betulus* (Hornbeam), in addition to many other noteworthy species, near Iscoed, Ferryside (SN31V), between arriving on the train and checking-in for evening dinner. This proved to be another new 10km square record.

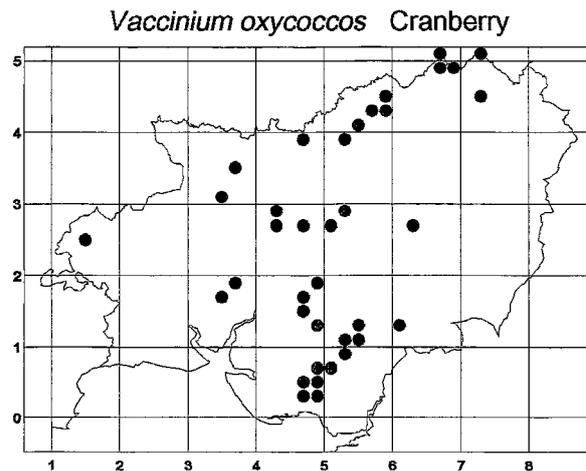
Graeme Kay and John Gibson recorded *Lepidium heterophyllum* (Smith's Pepperwort) from near Tyddyn-fari (SN269293) and a moderate colony of *Polygonatum multiflorum* (Soloman's-seal) from a wooded hedgebank at SN269297. They also found *Poa nemoralis* (Wood Meadow-grass) and *Agrostis vineale* (Brown Bent) in the tetrad (SN22U), the latter a new 10km square record. Both of these grasses are probably overlooked and are likely to be more widespread in the vice-county than the distribution maps (below) indicate. At a chapel graveyard near Blaenwaun (SN233276) in SN22I, they discovered three plants of *Platanthera*



*chlorantha* (Greater Butterfly Orchid) among many of *Dactylorhiza fuchsii* (Common Spotted-orchid), both new 10km square records, growing with two plants of *Orchis mascula* (Early-purple Orchid) and five of *Listera ovata* (Common Twayblade). Also in the tetrad were *Ononis repens* (Restharrow), *Carex pulicaris*, *Sagina subulata* (Heath Pearlwort) and *Coronopus squamatus* (Swinecress), also all new to the 10km square.

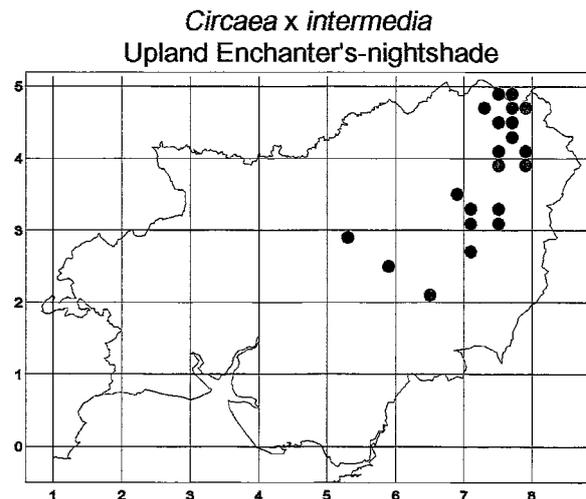
Jean Green and Pauline Goodhind also noted *Polygonatum multiflorum*, apparently native on a streambank at Cwmfelin Mynach (SN222247), whilst *Salix x sericans* (= *S. capraea* x *S. viminalis*) was also in the same tetrad, 0.5km north of Bumper Farm, at SN236247, and proved to be new to the 10km square. They also discovered rich flushed habitats near Capel Iwan with *Hypericum elodes* (Marsh St. John's-wort) (new 10km square), *Hydrocotyle vulgaris* (Marsh Pennywort) and *Wahlenbergia hederacea* (Ivy-leaved Bell-flower) at SN304314 and in the same tetrad (SN33A) had new 10km square records for *Alchemilla glabra* (Lady's-mantle) and *Conium maculatum* (Hemlock). Jean also found *Poa nemoralis* in the Marlais Valley at Gilfach Meredydd, north of Brechfa (SN 53B).

RDP and GH visited SN22J where three plants of *Viola cornuta* (Horned Pansy) were found growing over a c100m length of lane-side hedgebank, presumably having at some time escaped from the garden of a nearby derelict cottage. This was a new vice-county record and the third record for Wales. An area of remnant unmanaged *Molinia*-dominated heathy grassland at Crugelwyn Common (SN233288) was welcome relief in an otherwise rather intensively farmed tetrad and produced, for instance, several sedges, *Carum*, *Succisa pratensis* (Devil's-bit Scabious), *Narthecium ossifragum* (Bog Asphodel), *Calluna vulgaris* (Heather), *Erica tetralix* (Cross-leaved Heath) and *E. cinerea* (Bell Heather). In similar, though recently burnt, habitat near Triol-bach, Hermon (SN343317) they discovered about six *Vaccinium oxycoccos* (Cranberry) plants in flower within an area of about 10m<sup>2</sup>.



### Records from the North-east of the Vice-county

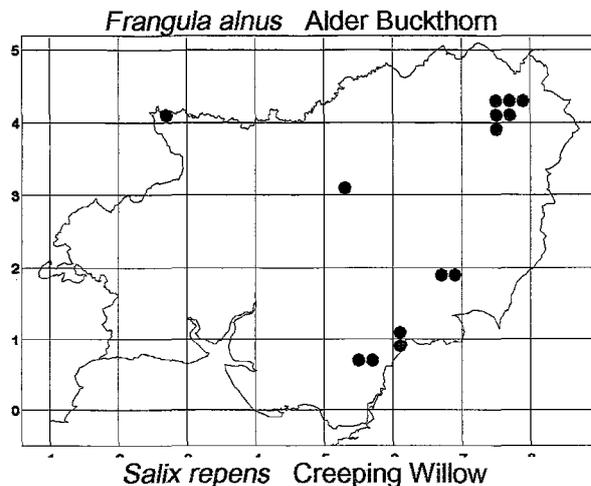
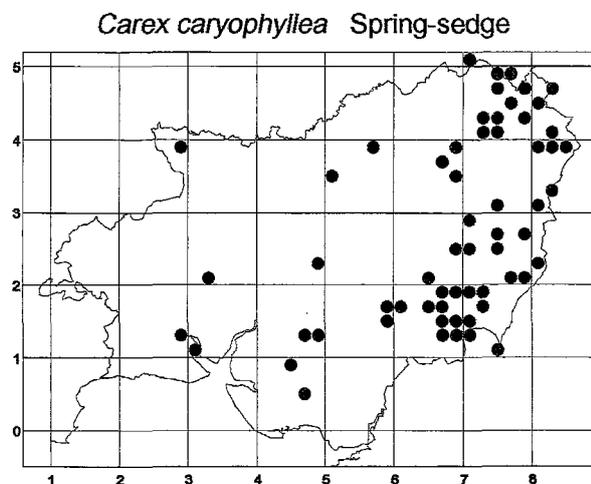
Louise Midgley provided a species list from Cwm-marchon Farm, north of Llanwrda (SN698343), which included *Circaea x intermedia* (Upland Enchanter's-nightshade), *Hordeum murinum* (Wall Barley), *Petasites hybridus* (Butterbur), *Carex vesicaria* (Bladder Sedge) and *Carum*, the first three being new 10km square records.



The second vcr of *Luronium natans* (Floating Water-plantain) and first since Ronald May's record of 1962 from the Bishop's Pond, Abergwili, was made by Ray Woods (RGW) when he discovered at least 100 plants growing in an old ox-bow of the Afon Tywi at Llanwrda (SN7130). RGW also discovered one plant of *Neottia nidus-avis* (Bird's-nest Orchid) in a wooded area by the Tywi at Cilycwm (SN754373). This was the fourth vcr and second 10km square record. The third vcr had been made the previous year by Neil Matthew in woodland in the Lash valley at Tireinion, Llandybie (SN600147).

Dafydd Dafis (DD) reported his discovery of three plants of *Botrychium lunaria* (Moonwort) in grassland by an old building at the site of the Nant-y-mwyn leadmine (SN787445) growing with *Calluna*, *Nardus stricta* (Mat-grass), *Potentilla erecta* (Tormentil) and *Linum catharticum* (Fairy Flax). This was a new 10 km square record for the species. Two new records of *Ophioglossum vulgatum* (Adder's-tongue) were from Bwch-y-Rhiw Chapel graveyard (SN801319) (in addition to c50 plants of *Listera ovata* (Twayblade)) and meadows east of Llanddeusant Church (SN778246) (both GH & RDP). Ten plants of *Ophioglossum* were refound by Liz Flood and RDP at the Dyfed Wildlife Trust reserve at Crug Melyn, southwest of Brechfa (SN502281) on 27 April where the species had not been seen for several years.

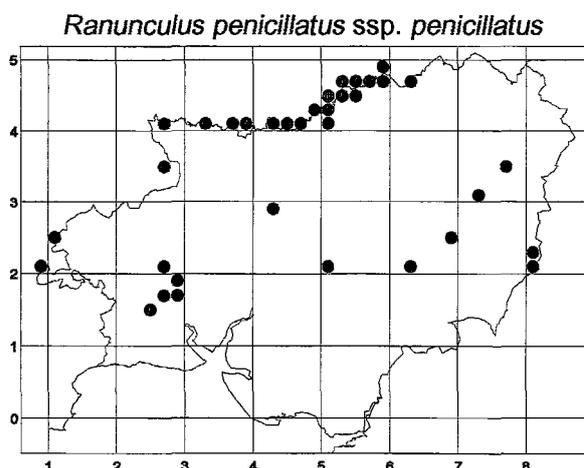
The first post 1930 records of *Salix repens* (Creeping Willow) and *Sherardia arvensis* (Field Madder) for SN74 were made by M&JI from the Llyn Brienne tetrad (SN74Z). They must also take the prize for marathon recording session as they spent two and a half days in the rather unpromising Cwm Rhosan tetrad (SN74L) where they recorded only 184 species but brought the total up to 240 from less than 150. The most notable records were a bush of *Frangula alnus* (Alder Buckthorn) at SN759435, *Carex caryophylla* (Spring Sedge) and the



second post 1930 SN74 record of *Salix repens*.

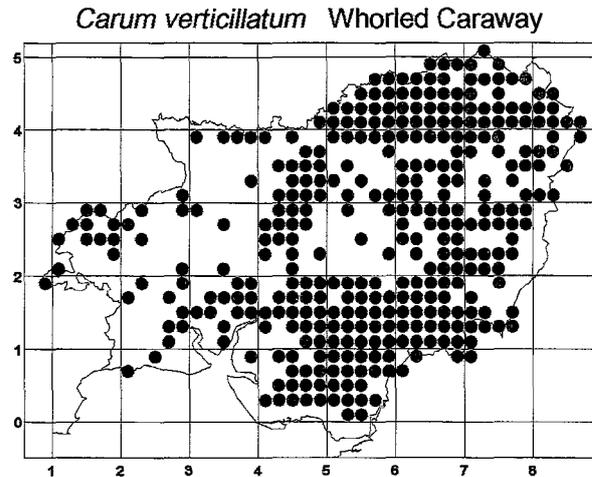
IKM reported *Potentilla erecta* subsp. *strictissima* from the edge of a ride in the Crychan Forest (SN842398). He also discovered the same taxon on a roadside hedgebank south of Lliest Farm, Upper Brynamman (SN705143). These were the 4th and 5th vc records and both new 10km squares. He also reported the presence of *Juncus effusus* forma *spiralis* (Corkscrew Rush) from an upland pasture at Disgwylfa, below the Carmarthen Fan (SN814235) on 14 December.

The BSBI meeting jointly led by Arthur Chater (AOC) and RDP visited sites in both Carmarthenshire and Cardiganshire and has been described elsewhere (Chater & Pryce, 1995). Carmarthenshire highlights at Pant-y-pistyll (SN634476) where a variety of grassland, heath and wetland habitats occurred in a very compact area included fifteen spikes of *Platanthera chlorantha* (Greater Butterfly Orchid) in the hay meadow, *Utricularia minor* (Lesser Bladderwort) and *Eleogiton fluitans* (Floating Club-rush) in the pond and *Ranunculus penicillatus* subsp. *penicillatus* (Stream Water-crowfoot) in a very small stream. This latter species, which was a new 10km square record, is



particularly frequent in the Afon Teifi which forms the northern vc boundary between Lampeter and Cenarth.

*Carum verticillatum* (Whorled Caraway) was recorded from no less than seventeen new tetrads, thanks largely to the CCW Phase 1 teams and brings the total number of tetrads where this species has been recorded to 347. The map continues to exemplify the centres of distribution as the coalfield in the south together with the northern and north-eastern uplands. What has not been so apparent in the past is the additional concentration in SN42 and SN43. Indeed the first record for SN42 was only made in 1982 at the start of the scheme! The absence of the species away from the coastal flats is also marked (the population at Marros Mill (SN20D) is now thought to be extinct due to *Salix* scrub invasion).



### CCW Survey Records and Other Inland Records

Of the great volume of records made by the CCW teams, probably the following are most noteworthy.

*Osmunda regalis* (Royal Fern) was found near Caeglas, Brechfa (SN557302) by JMSB & David Stephens and at Arcada Park (SN487183) by SA. IKM also found the species in Brechfa Forest at SN475283 and RDP in a flush near Ffrwd Farm, Pembrey (SN431029) where it was growing with *Hypericum elodes* (Marsh St. John's-wort), *Potamogeton polygonifolius* (Bog Pondweed) and *Carex laevigata* (Smooth-stalked Sedge).

Several hundred plants of *Carex dioica* (Dioecious Sedge) were found at Gellybevan (SN7020) by Dawn Grey (DEG) and JMSB (1992) which was a previously unknown population despite this farm having been botanised in the past. The only previously known population, at Clogau Mawr on Mynydd Du (SN720194), recorded in 1976 by Mrs. Vaughan, remains elusive.

A new site for *Carex viridula* subsp. *brachyrrhyncha* (Long-stalked Yellow-sedge) holding several hundred plants was found by DEG & JMS at Cilmaenllwyd (SN6720) (1992).

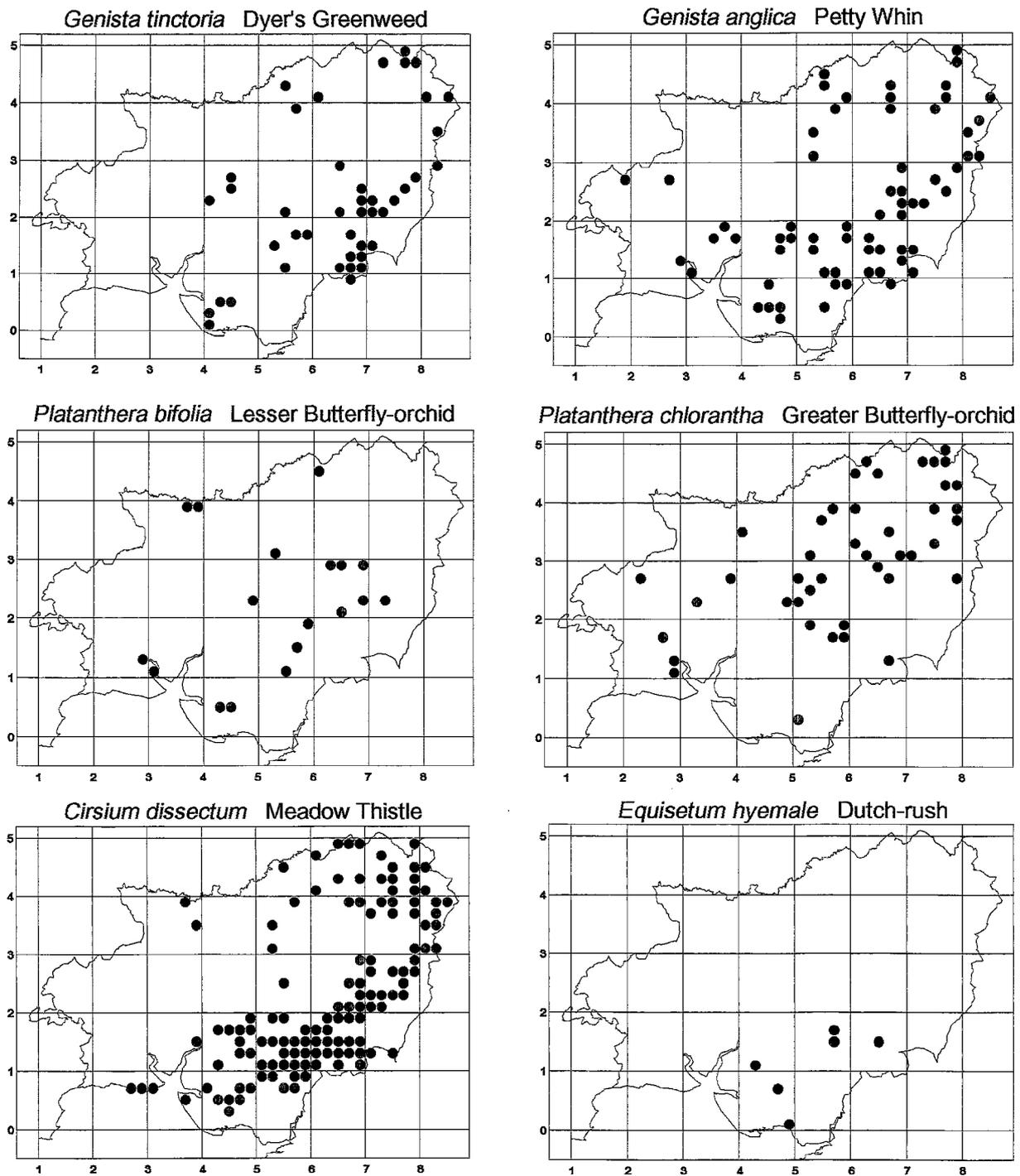
*Galium uliginosum* (Fen Bedstraw) was found in three sites by JMSB & GSM: Cae Maes-y-ffynnon, Pen-y-graig-goch and Llwynroser (all in SN72L).

Twenty spikes of *Dactylorhiza majalis* subsp. *purpurella* were present at Cwrtbrynbeirdd (SN6518) when the site was surveyed by JMSB & GSM in 1993.

A new inland site for *Epipactis palustris* (Marsh Helleborine) at Pen-y-graig-goch (SN7422) discovered by JMS & GSM compliments the nearby Maes-y-ffynnon site.

Other Phase I and II Survey discoveries of new sites including *Vicia orobus* (Wood Bitter-vetch), *Carex montana* (Soft-leaved Sedge) and *Eriophorum latifolium* (Broad-leaved Cottongrass) have been mentioned in previous Annual Reports.

New sites for several locally scarce species such as *Dryopteris carthusiana* (Narrow Buckler-fern), *Botrichium lunaria* (Moonwort), *Genista anglica* (Petty Whin), *G.*



*tinctoria* (Dyer's Greenweed), *Potentilla palustris* (Marsh Cinquefoil), *Hypericum elodes* (Marsh St.John's-wort), *Vaccinium oxycoccos*, *Pedicularis palustris* (Marsh Lousewort), *Serratula tinctoria* (Saw-wort), *Cirsium dissectum* (Meadow Thistle), *Sanguisorba officinalis* (Greater Burnet), *Platanthera chlorantha*, *P. bifolia* (Lesser Butterfly Orchid) and *Gymnadenia conopsea* (Fragrant Orchid) (the list continues) were discovered by the Phase I team in particular.

John Steer reported eighty flowering spikes of *Platanthera chlorantha* at Brynduon, Bancyffordd (SN409345) which was a new 10km square record.

Jim Davies (JND) sent detailed species lists of various noteworthy sites around the county. For instance a *Menyanthes trifoliata* (Bogbean) - *Carex curta* (White Sedge)

- *Agrostis canina* (Velvet Bent) dominated basin mire at Waunuchaf, Alltwalis (SN438305) and *Molinia caerulea* (Purple Moor-grass) grassland with *Serratula* and *Carum* at Taicyd, Brechfa (SN522315). He also discovered a new colony of *Equisetum hyemale* (Dutch-rush) at Carwe (SN469070), the fifth naturally occurring population in the vc.

First recorded in the vice-county by IKM in 1991 at Cwm Clydach, c2.5km south-west of Pontyates (SN437065), a second record of *Trichomanes speciosum* gametophyte (Killarney Fern) has now been submitted. AOC discovered an abundance of the plant in a dry rock cavity under an overhang on a north-west facing wooded slope at the bottom of Allt Penrhyn wood, Forge-Cych (SN254413).

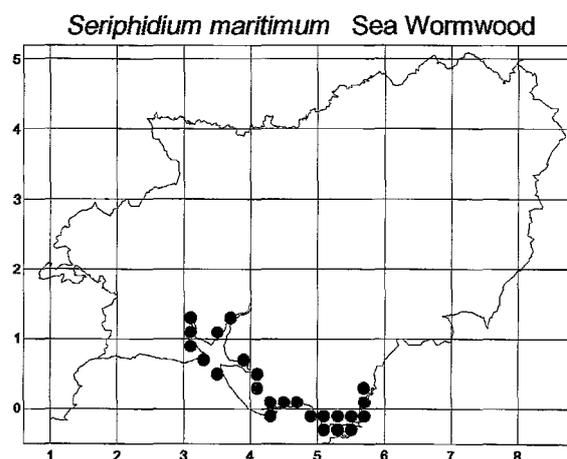
### Coastal Sites

Peter Jones (PSJ), Clive Hurford, IKM & RDP, participants of the early March site visit to the RAF bombing range at Tywyn Burrows primarily to discuss site management to encourage the possible recovery of *Liparis loeselii* (Fen Orchid) witnessed, not only the recent severe erosion of the dune-front, but also the consequent dislodging of one of the *Yucca recurvifolia* (Curved-leaved Spanish-dagger) plants which was lying at a forlorn angle at the base of the 4m high sand-cliff (cSN361045). It is thought that these plants, which may reach 2m in height, (at least four have been recorded at this site over the last twenty years) have become established from germinated seeds that have drifted across the Atlantic from the species' native habitat in south-eastern USA. Similar occurrences occur in Glamorgan. A second visit by PSJ, IKM, GSM *et al* in July resulted in the discovery of populations of *Carex disticha* (Brown Sedge) and *Schoenoplectus lacustris* (Common Club-rush), the latter new to Tywyn Burrows.

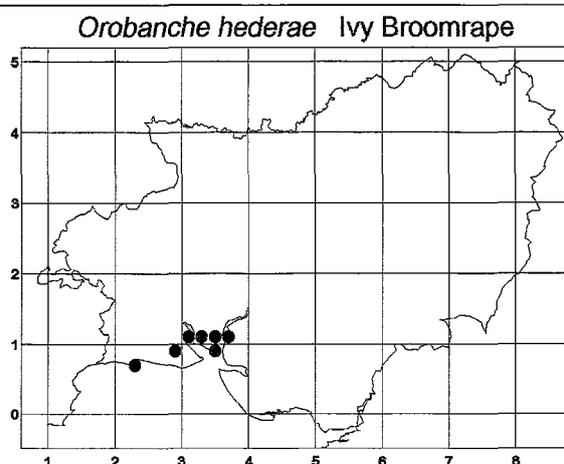
Members of the conservation group of the Proof and Experimental Establishment, Pendine were shown the *Populus nigra* subsp. *betulifolia* trees planted near the main gate (SN261087) which were contrasted with other poplars nearby. Highlight, however, was the discovery of two very photogenic plants of *Coeloglossum viride* (Frog Orchid) by Jack Donovan (SN277074). The lack of proper monitoring and management at this important site is of great concern, particularly as its future, in the light of recent MoD cut-backs, is far from certain.

Morfydd Lloyd of CCW made the first Welsh record of the hybrid foxtail grass *Alopecurus x plettkei* (= *A. bulbosus* x *A. geniculatus*) (det. T.A.Cope) from the upper saltmarsh near Mwche Farm, Llanybri (SN320112) where it was growing with both parents.

Frank Webb reported *Seriphidium maritimum* (Sea Wormwood) from the concrete wall of the eastern breakwater of Burry Port Harbour (SN 4446002). This proved to be a new tetrad record. When visiting the site later, RDP confirmed *Limonium procerum* subsp. *procerum* (Rock Sea-lavender) and *Vicia sativa* subsp. *segetalis* (Common Vetch) growing nearby.



Two spent spikes of *Orobanche hederæ* (Ivy Broomrape) were discovered near the summit of Gilman Point, Pendine (SN228075) by RDP & A.Griffiths on 15 October, which was a new site for the species and a large population of *O. minor* (Common Broomrape) was found along the edge of the railway line alongside Trinity Road, Morfa, Llanelli (SS512993) by IKM in June.



A normally coastal species in Carmarthenshire is *Ranunculus sceleratus* (Celery-leaved Buttercup), but Mrs Annie-Mary Pell discovered a plant growing as a weed in a garden tub at a property in Wernddu Road, Ammanford (SN61) which was a new 10km square record.

### Critical Taxa

Determinations of *Taraxacum* (dandelion) specimens collected in 1993 were received from John Richards and Andrew Dudman. There were no less than sixteen new vc records and sixteen 2nd vc records. First records were *T. argutum*, *T. celticum*, *T. cophocentrum*, *T. fagerstroemii*, *T. hesperium*, *T. hexhamense*, *T. interveniens*, *T. lacerifolium*, *T. laticordatum*, *T. lepidum*, *T. oellgaardii*, *T. pannulatifforme*, *T. sahalinianum*, *T. subundulatum*, *T. tenebricans*, *T. tumentilobum* and *T. xanthostigma* agg. 2nd records were *T. aberrans*, *T. anceps*, *T. atactum*, *T. cordatum*, *T. dilatatum*, *T. hesperium*, *T. intumescens*, *T. laeticolor*, *T. lunare*, *T. necessarium*, *T. rhamnoides*, *T. sahalinianum*, *T. stereodes*, *T. tumentilobum*, *T. undulatiflorum* and *T. xanthostigma* agg. In addition Mike Porter recorded thirteen *Taraxacum* species from Llethrhir, Cynghordy in 1991 which included *T. euryphyllum* (first vc record) and *T. aberrans*.

Jim Bevan determined *Hieracium* (hawkweed) material collected by GH from east of Burry Port railway station in 1989 and 1993 which proved to be *H. rigens* and was a new 10km square record.

The *Rubus* (bramble) recording meeting based at Trinity College, Carmarthen has been written-up elsewhere (Pryce, 1995). First vcrcs included *Rubus adscitus*, *R. ariconiensis*, *R. breconensis*, *R. lamburnensis*, *R. largificus*, *R. melanodermis* and *R. spengelii*, and *R. amplificatus*, *R. flexuosus*, *R. lamburnensis*, *R. melanodermis* and *R. nessensis* were 2nd vcrcs.

Following recent interest in *Rorippa islandica* ss AOC, GH and RDP embarked upon a survey of the Tywi valley on 27 October, in order to locate new sites for the species. Several promising areas between Dryslwyn and Llandovery were searched but despite the discovery of several localities supporting *Rorippa palustris*, the only place where *R. islandica* ss was confirmed was on the edge of an ox-bow at Pentre Dafis, east of Dryslwyn (SN567201). The species, previously known from only a few sites in Carmarthenshire, particularly in the Teifi valley, had been identified by AOC on waste-ground at Cwmann (SN582473) at the start of the BSBI excursion on 30 July. (Chater & Pryce, 1995)

More *Euphrasia* (Eyebright) determinations were received from Alan Silverside. Most interesting was a "hirsute variant" of *E. scottica* collected from Nant Iwrch, Caio (SN7039) by Mary Barnes in 1953. *E. confusa x micrantha* was collected from Bwlch-y-Rhiw (SN719461) by M&JI and there were several collections of *E. confusa x nemorosa*: Crychan Forest (SN826382, M&JI, 1991), Upper Cothi Valley (M&JI, SN713475) and Penrhyngwyn (SS517973, IKM and Barry Stewart).

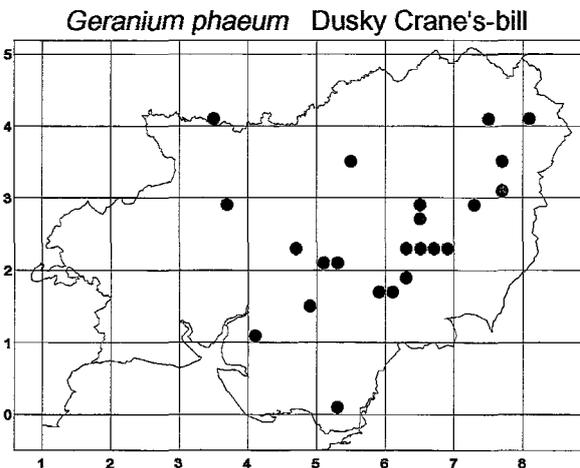
Specimens of Michaelmas Daisies accumulated at NMW over the years were sent by GH to P.F.Yeo for determination and produced first and second authenticated records of *Aster x salignus* from Kidwelly railway station (SN401065) (GH, 1965) and Llangennech (SN561012) (IKM), the first record of *Aster x versicolor*, a garden throw-out at Llwynhendy (SS537994) (IKM) and first and second records of *Aster x lanceolatus*, a garden throw-out at Stradey, Llanelli (SN495013) (IKM) and on a fly-tip at The Green, Llansteffan (SN357109) (IKM).

Two specimens of *Cotoneaster* recently determined by Jeanette Fryer proved to be new Welsh records. Material of *C. atropurpureus* was collected from a hedge at The Graig, Burry Port (SN444016) by GH in 1991 and IKM collected *C. salicifolius* 'Repens' from a roadside bank in Penyfai Lane, Llanelli (SN497016) in 1993.

*Salix* (Willow), *Populus* (Poplar) and *Ulmus* (Elm) received attention by AOC, IKM, GH and RDP and accounts of their various researches appear elsewhere (Morgan, 1995 and in press; Hutchinson, in press)

### Non-natives

*Geranium phaeum* (Dusky Crane's-bill) was recorded by Marion Herbert who sent two records of this species, the first from Cribyn Organ (SN361293) and the second from Llwyn Howel, near Whitemill (SN474226). Both proved to be new 10km square records. DD also recorded *G. phaeum* abundantly naturalized on a road verge near Crymlyn Manor (SN651234). JND reported *Ceratophyllum demersum* (Rigid Hornwort) growing in an ornamental pond at Garnant (SN693134).



I can only assume that the *Dianthus armeria* (Deptford Pink) discovered by Janet and Keith Crowden on an old trackway at Bryndias Farm, Pinged (SN434034) cannot be a native site, but its origin remains a mystery. RDP visited the site in October when it was obvious that the first generation of plants had reproduced and died and had been replaced by a second generation of much less robust specimens. In total RDP counted 238 individuals, some up to 0.6m tall.

IKM, whilst doing some "back-lane botanising" in the urban areas of Llanelli, discovered the distinctive bramble (*Rubus laciniatus*), sometimes cultivated for ornament, growing at the base of a wall behind Cedric Street (SN513002). This was a new vc record although the species has been previously recorded elsewhere in Wales as a naturalised plant, presumably of bird-sown origin. Other street weeds were *Cosmos bipinnatus* (Mexican Aster) recorded by GH at the base of a crumbling

wall of a back-lane off Andrew Street, Llanelli (SN510007), a plant of *Erigeron karvinskianus* (Mexican Fleabane) discovered growing out of the door-step of no.1 Queen Street, Carmarthen (SN414200) where all the properties are commercial and lacking gardens, thus not presenting the opportunity for garden escapes in the near vicinity (JND) and *Satureja montana* (Winter Savory) from a brick wall in Bryn Avenue, Burry Port (SN453009) (IKM, 1993). All were new vc records.

A bird seed alien which appeared in IKM's garden in 1993 was *Eruca vesicaria* subsp. *sativa* (Garden Rocket) (SS537993). A plant of *Carthamus tinctorius* (Safflower), also presumed to be of bird-seed origin, was found growing in October 1994 on waste ground at Machynys (SS512985), also by IKM (det. GH). Both were new vc records.

The invasive north American *Lemna minuta* (Least Duckweed) continues to spread: IKM reported new sites at Dafen Pond (SN532015) where it is dominant under flooded *Salix* carr and also in the pond in front of the Wildfowl and Wetland Trust Penclacwydd visitor centre (SS531983). Another alien water plant, the south American *Lagarosiphon major* (Curly Waterweed), was recorded by IKM in the pond on the restored Glyn-tai opencast site, Saron (SN 609128).

### ***Viscum album* (Mistletoe)**

At the end of 1993 about a dozen *Viscum* sites were known but BS reported a major population of at least thirteen plants in an old apple orchard at Glanamman (SN672128) in late 1994. This record and the current BSBI Mistletoe survey prompted GH & RDP to check as many old records as possible. Only one of the original records (consisting of three separate populations in old orchards at Hermon (SN6728)) proved to be extant. Even plants known as recently as seven years ago at Cnap-llwyd, Glanamman (SN678124) and Llanmiloe House, Pendine (SN248088) had disappeared. However, appeals in the local press have so far produced previously unknown sites at Croes-y-ceiliog (SN407165) and Bethlehem (SN684251) and have brought to light an old record at Llangadog (SN702287) that had eluded GH & RDP during their search.

### **Closing Thoughts**

Very few tetrads now have less than 200 species recorded within them except where uniformity of habitat indicates that a lower total should be expected. The map below illustrates this point. The emphasis on future recording should therefore concentrate, for instance, on filling in gaps where they effect individual species. In the meantime the writing-up phase must begin and I hope that by this time next year a significant proportion of the species accounts will have been completed.

### **Acknowledgements**

As always I am greatly indebted to all who have contributed records during the year and to all referees who so willingly give of their time and without whom many plant riddles would remain unsolved. In particular I must thank Andrew Dudman and John Richards (*Taraxacum*), Alan Newton and Mike Porter (*Rubus*), Alan Silverside (*Euphrasia*) and Arthur Chater (*Carex*, *Rorippa islandica* etc, etc). Locally, Ian Morgan and George Hutchinson must be acknowledged for their constant encouragement, despite my frequent lapses which include, among others, memory, filing and computing. Finally I must also thank IKM and GH for reading and correcting the draft of this report.

## References

Chater, A.O. and Pryce, R.D. (1995). Reports of Field Meetings - 1994: Lampeter Area (vcc 44 & 46). 30th July 1994. *BSBI News*: 69, 69-70.

Morgan, I.K. (1995). The Llanelli Levels. *Llanelli Nats. Bull*: 1, 4-32.

Morgan, I.K. (in press). The Black Poplar in Carmarthenshire. *Llanelli Nats. Newsl.* 59.

Hutchinson, G. (1995). Field Meeting Report: Cotoneaster Walk, Parc Howard, Llanelli, 17 September 1994. *Llanelli Nats Newsl*: 58, 6.

Hutchinson, G. (in press). *Salix* (Willows) in Carmarthenshire - a guide to identification. *Llanelli Nats Bull*: 2.

Pryce, R.D., (1995). Reports of Field Meetings - 1994: *Rubus* Recording Weekend, Carmarthen (vc44). 21st - 24th July 1994. *BSBI News*: 69, 66-68.

Richard Pryce, Trevethin, School Road, Pwll, Llanelli, Dyfed, SA15 4AL.

## Number of species recorded in each tetrad.

