

# WELSH BULLETIN

Editor: R.D.Pryce

No. 51, SPRING 1991



22-21-576

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*Carum verticillatum*, Koch.

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HERB. J. E. GRIFFITH

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### EDITORIAL

Bulletin No. 50 was very well received. It prompted several favourable comments expressing approval of the contributions from each Welsh recorder outlining the present level of botanical knowledge in each vice-county. It also served very well to contrast the ways by which each individual deals with the many problems encountered, often dictated by the size and degree of remoteness of each area. There is certainly a need to encourage a greater number of competent botanists to turn their attentions to Wales - especially the more inaccessible parts. My own experience shows it to be impossible to comprehensively record a large county to tetrad level in a reasonable time without a substantial measure of help of a small number of reliable surveyors. I am sure that there is a source of local talent just waiting to be tapped, in the guise of the "sleeping" Welsh B.S.B.I. members, a few of whom are present in most parts of Wales.

There seems to be no shortage of material for inclusion in the Welsh Bulletin at present. Several topical papers are presented in this issue together with the 1988 plant records - continuing the series intended to bring the back-log up to date. Having said that the continuing supply of articles depends on you, the readership, please do not hesitate to send me copy on any aspect of the Welsh flora which may be of interest to fellow botanists.

The programme of 1991 Welsh field meetings is included below, together with the agenda and arrangements for the A.G.M. and Exhibition Meeting to be held at Trelleck near Monmouth in early July. The standard of accommodation is very high and I can strongly recommend it, so please make every effort to attend, not forgetting to bring exhibits and slides. Trevor Evans will lead local field excursions in conjunction with the A.G.M. which will give a brief insight into the Gwent flora.

I, and the other Wales committee members, look forward to seeing you there and at other venues through the season.

Richard Pryce, 17th April 1991

All back issues of the BSBI Welsh Bulletin are still available on request (originals or photocopies). Please send cheque made payable to BSBI Committee for Wales at £1 per issue, which includes p & p, to 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.

## ANNUAL GENERAL MEETING, 1990

The Seventh Quadrennial Meeting, Twenty-eighth Annual General Meeting and Eighth Exhibition Meeting of BSBI Wales was held at Bangor Normal College and Treborth Botanic Garden, Bangor, Gwynedd, on Saturday 21 July, 1990.

On the Friday evening, members resident at the College enjoyed an illustrated talk by Nigel Brown. On Saturday, members split up to do tetrad recording in lowland sites for the *Flora of Caernarfonshire* recording project, before returning to Treborth for the AGM.

After tea, the Chairman opened the Annual General Meeting. Apologies for absence were received from S.B. Evans, Q.O.N. Kay, R.G. Woods and G. Wynne. The Chairman, on behalf of those present, expressed the hope that Mr Geoffrey Battershall would make a speedy and complete recovery from his recent accident. The minutes of the last AGM, published in the *Welsh Bulletin* No. 49, Spring 1990, were then taken as read.

The Chairman, in her opening remarks, welcomed all members present and thanked all those who had helped the Society in Wales during the past year, mentioning in particular: members of the Committee for Wales, especially its Secretary and Treasurer, the editor of the *Welsh Bulletin*, the leaders of all the Welsh field meetings and the Welsh vice-county recorders. She then thanked Nigel Brown for the excellent way in which he had organized the meeting, and finally she thanked the officers of Bangor Normal College and Treborth Botanic Garden. She commented that this was almost her final act as Chairman, after 4 years and she had enjoyed serving with a very 'ruly' committee.

### Hon. Secretary's Report

The Hon. Secretary then gave his report on the last years activities. He started by mentioning the celebration of the 100th birthday of one of our members, Mrs Irene M. Vaughan. Mrs Vaughan was no ordinary member, she was one of the founder members of the Committee for Wales, a past Chairman and General Secretary of that Committee, Welsh representative on Council, Editor of the *Welsh Bulletin*, Vice-county recorder for Carmarthenshire, Referee for *Rosa*, and Vice-president of the BSBI. Until her move to Suffolk in the late 1970s she was one of the most active members of the Society in Wales. To commemorate this rare achievement, a celebratory issue of the *Welsh Bulletin*, no 48, was devoted to an appreciation of Mrs Vaughan and her work in Wales.

He commented that with the election of David Humphreys to the Committee for Wales at last years AGM, the committee remained at full strength for the year.

Two issues of the *Welsh Bulletin* had been issued since the last AGM; no 48, Mrs Vaughan's 100th birthday issue, and no. 49. George Hutchinson had again been responsible for producing the *Bulletin* while Ian Morgan remained as editor for no 48, but had since resigned; he was warmly thanked for procuring and editing the papers for 9 issues of the *Bulletin*, nos 40 - 48 from October 1984 to Winter 1989. George Hutchinson was also thanked for planning and executing the production of the *Bulletin* almost single handed, as was Richard Pryce, who had stepped into the breach at the last minute and volunteered to act as editor, and had now been confirmed in the post.

Eight field meetings were organised for Wales during the year and all were well attended, with one, at Kenfig dunes, being very much

oversubscribed with a dozen or more disappointed members unable to get a booking.

The proposed landscaping of lead and other heavy metal mine sites throughout Wales had again occupied the Committee during the last 12 months. As mentioned at the last AGM, a letter had been sent to the Welsh Development Agency pointing out the dangers involved and asking for proper surveys to be carried out before work was started. A reply had eventually been received which indicated that the WDA were at least aware of the problem, and would not take any hasty action. The Chairman of the BSBI's Conservation Committee, Dr Frank Perring, also wrote to the WDA on our behalf.

Other topics of a conservation nature that were discussed by the Committee included the threat to Fenn's Moss, a raised mire on the borders of Clwyd and Shropshire, with such rarities as *Andromeda*. The site has recently come under new ownership and peat extraction had been increased by a factor of 4. Attempts were being made to buy at least part of the site and the fight had now been taken up by an anti-peat campaign. Jean Green and Paul Day were co-ordinating the BSBI's opposition to the peat extraction.

The threat to Pembrey Saltings in Carmarthenshire had now been lifted, and subject to successful consultations between Llanelli Borough Council and conservation bodies, the site could be declared a Local Nature Reserve. Richard Pryce had been our very active campaigner against the development.

The Secretary then recorded the thanks of the Society to the various organisations that had helped over the past year: to the officers of Bangor Normal College and Treborth Botanic Garden; to the NCC for allowing the Committee for Wales to meet in its offices at Plas Gogerddan, Aberystwyth and Llandrindod Wells; and to the National Museum of Wales for Secretarial assistance, for the production of the *Welsh Bulletin*, and for its help in many other ways.

Members were then reminded of the following days field meeting looking at upland sites in the Betws-y-Coed area led by Nigel Brown. On August the 19th, the last field meeting of the year organised by the Committee for Wales would take place, led once more by Nigel Brown.

Finally members were reminded that there was a talk after the AGM on 'The Flora of Caernarfonshire Recording Project', by Nigel Brown, and that would be followed by a tour of the Gardens. After dinner back at Bangor Normal College campus, the exhibition would be open and slides shown.

#### Hon. Treasurer's Report

The Treasurer, Mr R.D. Pryce, then gave his report on the financial situation, which was satisfactory. He reported a general improvement with subs to the *Welsh Bulletin* bringing in about £100.

Putting on his editor's hat he reported that the next issue of the *Welsh Bulletin* would be the 50th and it was hoped to include reports on Botanical recording throughout Wales.

#### Elections

##### Chairman

Mr Trevor Evans was nominated by the Committee for the four year post of Chairman and Welsh Representative on Council, and in the absence of any further nominations was carried by acclamation.

Mr Evans then took the Chair and paid tribute to all the hard work Jean Green had put in on behalf of the Society in Wales during her term of office, a sentiment that was warmly applauded by all present.

#### Vice-Chairman

Mr Paul Day was nominated by the Committee for the post of vice-chairman and in the absence of any further nominations was approved unanimously.

#### Officers

The Hon. Secretary, R.G. Ellis and Hon. Treasurer, R.D. Pryce, were both nominated for re-election to their respective posts and, in the absence of any other nominations from the floor, were duly elected.

#### Committee Members

S.B. Evans, G. Hutchinson, Q.O.N. Kay and G. Wynne were due to retire under rule 5 of the constitution and were eligible for immediate re-election. All four members had indicated their willingness to stand again, and, in the absence of any other nominations from the floor, were duly re-elected to serve on the Committee for Wales for a period of two years. Mrs J.A. Green was nominated by the Committee for Wales to fill the vacancy caused by T.G. Evans' election as Chairman and in the absence of any other nominations from the floor, was duly elected, to serve on the Committee for Wales for a period of one year.

Under Any Other Business a motion to co-opt Mrs Elsa Wood, Secretary of the BSBI's Conservation Committee, to the Committee for Wales, was proposed by Nigel Brown seconded by David Humphreys and passed unanimously.

Mrs M. Wainwright, commenting on the proposition that Welsh Plant Records would in future give four-figure map references, thought that this could sometimes be undesirable. R.G. Ellis (editor), stressed that the four-figure map reference would only be included if the recorder agreed.

In the absence of any other business, the chairman declared the Annual General Meeting closed and invited Nigel Brown to deliver his talk on the 'Flora of Caernarfonshire Recording Project'. Following this, a very enjoyable time was spent looking around the glasshouses and gardens. Members reassembled after dinner at Bangor Normal College for the exhibition, slides and videos.

#### Exhibits

Nigel Brown : Interesting native plants at Treborth

Ann Conolly : West Lleyn Flora  
: *Aconitum x cammarum* in West Lleyn

Gwynn Ellis : Index to British Vascular Plants  
: Recent additions to the Library of the National Museum  
of Wales

Trevor Evans : Aspects of the Monmouthshire flora 1985-89

Jean Green : *Stachys alpina* in Denbighshire  
: *Carex x gaudiniana* in Denbighshire

George Hutchinson : Distribution of *Dryopteris filix-mas* agg. in Wales  
 : Distribution of *Polypodium* in Wales  
 : Distribution of *Asplenium trichomanes* in Wales.

Slides

Ann Conolly : Plants of the Lleyn Peninsula  
 : Welsh AGM Ferryside, 1989  
 Geoffrey Battershall : Arctic/alpine plants of Snowdonia

COMMITTEE FOR WALES, 1990-1991

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	Mr T.G. Evans
Vice-chairman	Mr P. Day
Secretary	Mr R.G. Ellis
Treasurer	Mr R.D. Pryce

Committee members

Mr N. Brown*	Mr S.B. Evans
Mrs J.A. Green*	Dr G. Hutchinson
Dr D.R. Humphreys*	Dr Q.O.N. Kay
Mr R.G. Woods*	Dr G. Wynne

Co-opted Mrs E. Wood

\*Members due to retire in 1991

Statement of Accounts from 1 Jan. 1990 to 31 Dec. 1990

Receipts	£	Payments	£
<i>BSBI Welsh Bulletin</i> Subs.	92.50	<i>Bulletin 49</i> production & envelopes	69.98
Wales AGM Accommodation	777.50	AGM Accommodation	706.38
Ferryside Meeting Accommodation	353.97	Ferryside Meeting Accommodation	303.32
	<u>Total £1223.97</u>		<u>Total £1079.68</u>

£

Carried forward from 1989 (General & Special Accounts)	162.26
Excess receipts over payments 1990	144.29

Total £306.55

Current Account Balance	117.40
Deposit Account Balance	189.15

Total £306.55

29th WELSH ANNUAL GENERAL MEETING  
AND  
9th EXHIBITION MEETING, 1991

Friday 5th July to Monday 8th July 1991

CAER LLAN CONFERENCE CENTRE, LYDART, nr MONMOUTH, GWENT

Programme

- Friday:* 6.30pm Dinner  
7.30pm Visit to some local orchid sites
- Saturday:* 10.00am Meet at Caer Llan for Field Meeting. The morning and early afternoon will be spent looking at several rich habitats in the area  
3.45pm Tea and meeting of Committee for Wales  
4.30pm Annual General Meeting  
5.00pm The Flora of Gwent, an illustrated talk by Trevor Evans  
6.30pm Dinner  
7.30pm Exhibition Meeting and slide show
- Sunday:* 10.00am Meet at Caer Llan for field meeting several sites further afield  
6.30pm Dinner
- Monday:* Disband after breakfast with opportunity to record in tetrads on the way home.

Accommodation (twin rooms with single supplement) will be available at Caer Llan at approx £20 per day, but the meeting is also open to non-residents.

Please apply for accommodation booking forms and maps of meeting places, or send bookings for the field meetings to Mr R.G. Ellis, Department of Botany, National Museum of Wales, Cathays Park, Cardiff, South Glamorgan, CF1 3NP.

The Lleyn peninsula occupies a central position in the distribution of Carum verticillatum in western Britain. This atlantic species was recorded in Lleyn from a single locality in the last century (Griffith, c.1895), and has subsequently been found in a number of places in the east of the peninsula (Ellis, 1983). Following a survey of semi-natural habitats in the west of the district over the period 1920-2, Rees (1928) listed C. verticillatum as an infrequent component of damp heath (rhos) and rush pasture, and he recorded it from a group of ten sites to the north of Pwllheli. Further localised records have accumulated from the 1950's onwards, mostly compiled by Mr Arthur Vaughan Jones, but the eastern half of the peninsula has never been thoroughly worked floristically, unlike west Lleyn where the flora has been systematically recorded by Miss Ann Conolly.

Recently, we have had the opportunity to make floristic records from mires, heaths and grasslands during a preliminary survey of habitats over the whole of the peninsula, carried out during 1987-8 by the Nature Conservancy Council (Howe et al., 1990). A number of new localities for C. verticillatum were discovered, and these are combined here with earlier records to provide a brief synopsis of the available information about its distribution in Lleyn.

All records have been included in the 1 km square distribution map of C. verticillatum shown in Fig. 1. (Detail in the locality given for the early record by Griffith (c.1895) is misleading as it is not near Abersoch as implied (A.P. Conolly, in litt., 1988)).

Survey results have confirmed that C. verticillatum is local and scarce in Lleyn. Most of the records are clustered in a central area of the peninsula, where it occurs in damp pastures associated with headwater streams of the Afon Erch, Afon Ddwryd and Afon Rhyd-hir; elsewhere it is known from a handful of scattered eastern localities in the catchments of other south-flowing rivers. All localities are low-lying, ascending from a little above sea level to 150m. C. verticillatum has been recorded most frequently in Lleyn in wet Juncus acutiflorus and J. effusus pastures, but it also occurs in Molinia vegetation and occasionally in drier acidic and neutral grasslands. In other parts of Wales, C. verticillatum is notably catholic in its associations, occurring in a wide range of acidic-neutral grassland, marsh and flush communities, as in Carmarthenshire (v.c. 44), for instance, where it is locally very frequent (Pryce, 1987).

The underlying causes responsible for the restricted distribution of C. verticillatum in Lleyn are not all readily apparent. Juncus, Molinia and other wet grasslands are still relatively abundant in the east of the peninsula (Fig. 2), but many apparently suitable sites are unoccupied. Altitudinal and

climatic factors, agricultural activities, and also perhaps limited means of dispersal, may all be involved. However, changes in land drainage and pasture management have undoubtedly influenced its local frequency; over half of the sites where it was recorded by Rees (1928) are now improved grassland.

In the more easterly parts of Caernarvonshire (v.c. 49), *C. verticillatum* is known only from several damp pastures in the Afon Glaslyn valley, and also very locally to the north of the Snowdonia massif.

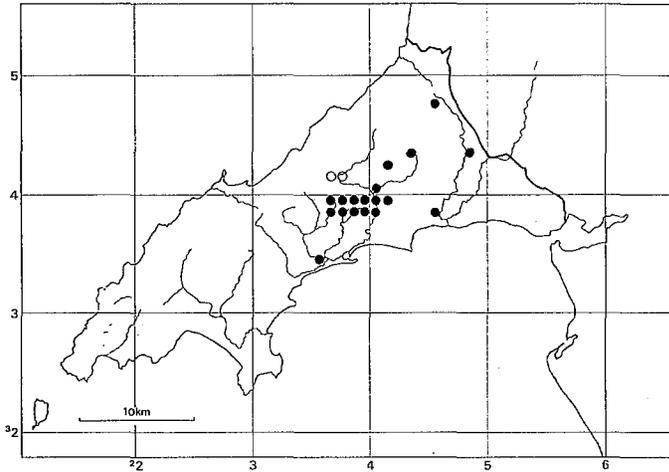


Fig. 1. The distribution (in 1 km squares) of *Carum verticillatum* in the Llyn peninsula. Dots represent post-1950 records; circles represent pre-1950 records.

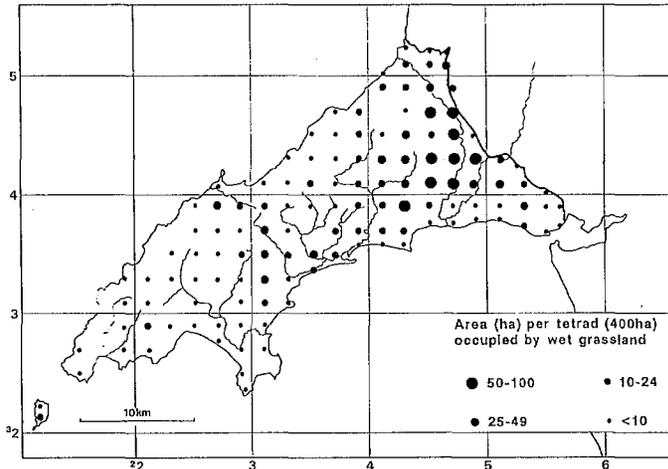


Fig. 2. The distribution and abundance (in 2 km square tetrads) of wet grassland, including *Juncus* and *Molinia* pasture, in the Llyn peninsula, recorded during 1987-8.

### Acknowledgements

We are very grateful to Ann Conolly and Gwynn Ellis for providing details of early records.

### References

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- Howe, E.A., Rimes, C.A. & Blackstock, T.H. (1990). A habitat survey of the Llyn peninsula. Nature Conservancy Council report, Bangor.
- Pryce, R.D. (1987). Carmarthenshire Flora project progress in 1986. BSBI Welsh Bull. 45, 15-22.
- Rees, J. (1928). A preliminary survey of the rough pastures of Llyn peninsula. Unpublished MSc thesis, University of Wales.

T.H. Blackstock, E.A. Howe & C.A. Rimes, Nature Conservancy Council, Penrhos Road, Bangor, Gwynedd, LL57 2LQ.

## The Clubmosses in NE Carmarthenshire

This paper was prompted by concern over evidence of decline in the clubmosses of the district awakened in the course of recording for the Carmarthenshire Flora Project. It seemed more important to alert readers to the situation than to wait until the question had been thoroughly researched. Because of the immediate overriding needs of the Flora Project, it has not been possible to investigate any records which may be available from the nearby area across the county boundary covered by the NE corner of the map (fig. 1). The fact that large tracts of this area are not forested is not at first sight very hopeful. However this could cut both ways: if large areas are disturbed, at least they are protected from grazing. Mr Chater's recent discovery of an impressive Selaginella population still further to the E near Soar-y-Mynydd shows how odd corners in a forested area may remain untouched.

The desirability of checking certain former records which had previously escaped notice has led to further investigations in March-April of this year (1991), and records (xxii) to (xxviii) below are recent. They do not materially alter the picture. The ease with which these plants escape the eye must be admitted, and one is sometimes tempted to rely on a belief that, for one plant seen, 10 are probably present. In certain localities this might be so; nevertheless there seems no doubt that the decline, especially in the last ten years, has been real, and Lycopodium clavatum in particular seems to be at risk. It is hoped that these notes will draw more attention to these inconspicuous and not very familiar wistful relics of the Carboniferous age which, in this area at least, may be seriously vulnerable.

When my wife and I bought Eithin, late in 1964, we were soon exploring the Mynydd Mallaen moor in all directions; indeed we spent more time there in those first few years than we have done in the remaining 20 odd. I cannot remember now whether we even knew what clubmosses were. But we had soon identified and become familiar with the odd fragments of Lycopodium to be found lying about on the turf and had made completely unsuccessful attempts to root some of them in the garden. I remember very approximately the locality of one such fragment, noted on the list below as no. (iii). It is perhaps significant that in those days, so far as I remember, these fragments were to be found on the open moor, sometimes far from the stations to which they are now confined.

At an early stage we had discovered the large colony of intermixed Diphasiastrum and Lycopodium on the steep E slope above the Afon Gwenlais where the river first makes a sharp substantial bend to the N; (site no. (iv) on the list). This was the first time we had encountered Diphasiastrum, and the first time we actually saw the plants growing. The locality could still be considered the prime site for the plant in the

district. After we had come to know Mrs Vaughan she told us about it, and I think it must have been the place she had principally in mind in her reference to "Mynydd Mallaen" quoted in May's list.

There followed a long period during which, regrettably, we did little further monitoring. Perhaps the most important indirectly relevant event here was the initiation of the Commons Registration scheme, which was certainly under way before 1972, the year in which we settled at Eithin for good. As a result of this scheme the Mallaen was officially registered as a common managed by a Grazier's Association of the surrounding farms. It was long before I fully appreciated that the very similar country (as it then was) to the N and E was privately owned and was therefore open to the improvement and afforestation which has since largely supervened. We recently came to hear of one population, no. (xvii), which had already disappeared in this way about 1960, and others may well have followed in the Nant-yr-Ast - Penrhiwiar sector, where there have been considerable changes.

1982 saw the inception of the Carmarthenshire Flora Survey, and we had a new reason to return to the Mallaen, and to cover it more systematically. In 1985 we encountered Huperzia for the first time, first near the headwaters of the Merchon, nos. (v) and (vi), and later above Bwlch-y-Rhiw, (ix); on the W side of the Gwenlais, (xii); and along the upper Nant-y-Clun and on Craig Diferion, (xiv) and (xv). The Lycopodium populations (vii) and (viii) opposite the Huperzia on the upper Merchon, and (x) and (xi) on the hillside above the Gwenlais also came to light during this period. In 1990 we learned of the extinct composite population near Blaen-Twrch, (xvii), which greatly extended the potential range, and by the courtesy of Mr Pickup, the Warden of the Gwenffrwd reserve, who devoted a long morning to showing it to me, I was able to see the widespread composite population (xviii) beside the upper Nant Gelynen.

However this picture of an unsuspected wealth of resources is sadly illusory and simply reflects a more thorough search. In fact in recent years there has undoubtedly been a decline, and some populations have vanished almost as soon as found. Already in 1987 the Lycopodium populations (vii) and (viii) on the upper Merchon were much reduced, and although another dead Lycopodium fragment, (xiii), seen about this time further to the W, led me to hope that there might be another colony in the area, nothing has appeared so far. In 1989, when we took Richard Pryce to see the plants at the head of the Merchon, all the Lycopodium had completely disappeared and all that could be seen of the Huperzia were a few depauperate plants on one wet rocky outcrop more or less in the centre of the previous array. At about the same time the Gwenlais Lycopodium populations (x) and (xi) seemed to have disappeared. In fact this year (1991) one plant of population (x) was re-discovered, and careful search might reveal a remnant of (xi), but of their drastic reduction there can be no doubt.



I am certain that the cause is grazing pressure. Evidence for this lies not only in the detached strands and fragments of Lycopodium but in the fact that practically the only active plants of this species now to be found lie hidden within some shrubby growth. As for Huperzia, it is the situations which are telling: in colonies (ix) and (xxi) the plants are confined to crevices between boulders; (xii) is deep within a large heather; and the plants in (xiv) are hidden in deep shade under stream banks. I was surprised to hear from Mr Pickup that his predecessor had recommended grazing as a course of management for the Gwenffrwd population, and I think he was rather surprised to find the colony by no means as robust as he had visualised. A grazing regime would be a counsel of perfection, to ensure light and control competitors, if the total population were perhaps 50-fold the size, but what is there at present simply needs to survive, and clearly, though the plants might not welcome shade, they tolerate it. It is worth noting that the problem seems especially urgent in the case of the lycopods. In general, what might be thought the "standard" complement of moorland species seems to cope.

The three species differ in their response. No reason can be seen for the fact that Diphasiastrum seems now to be more restricted in its distribution than the others, but at four of its localities it flourishes, and at the Gwenffrwd site it is the only one of the three species of which this could be said. It is the only species which in May's time was said to be "plentiful". It appears to be rhizomatous, and thus able to produce fresh aerial shoots indefinitely. Lycopodium, on the other hand, is definitely stoloniferous. I have not dared to disinter a plant to find out how it originates, but certainly the greater part consists of long trailing runners, woven in the turf and with only occasional adventitious roots, which are easily pulled out. The miniature fruticose habit of Huperzia would go in a single mouthful. Neither of these species seems able to regenerate, either from the base like a rosette plant, or from fresh shoots like heather.

The common status of the Mallaen is ambivalent: though free of the threat of ploughing and re-seeding it is never without sheep, and in certain seasons is heavily stocked. A contributory factor here is the increasing bracken cover, which squeezes the grazing into smaller and smaller areas. (Even this though is two-edged: Lycopodium will hide under light bracken cover!) And in this regard there is a further cause for concern. Though one attempt in the neighbourhood of Craig Rhosan a good many years ago seems not to have been very successful, the temptation to tackle the bracken by spraying must always be at the back of people's minds, and I wonder whether anyone at present knows how specific to Pteridium such sprays might be. It should, I feel, be a matter of BSBI concern to sound out the manufacturers on this point. Quite apart from the lycopods, there are colonies of Phegopteris, possibly Gymnocarpium dryopteris, and certainly one, and reputedly two sites for

Hymenophyllum wilsonii on the Mallaen to consider. In any case spray can drift far off course. Would the SSSI designation protect the site effectively in such an instance?

It seems that the possibility of applying for ESA status has been considered in the case of the Mallaen. This would involve an all-round reduction in stock which would probably require a unanimous decision from the graziers. So far nothing seems to have transpired. The only other possible answer would seem to be selective enclosure; and from first principles this is taboo on a common. Whether a reasoned application to the landlords (who are, I believe, the Crown Commissioners) and the graziers would be heard sympathetically is an open question. The Mallaen has the weight of SSSI status, but clearly such an unusual appeal would have to be well reasoned, and here I, for one, feel helplessly ill-informed on all matters of ecology and regeneration. Many questions arise. What kind of area would be meaningful? Could there be any basis for advancing even a provisional estimate of range of spore dispersal? How long do plants take to develop? What are the substrate requirements? Both Hyde, Wade & Harrison (1978) and Clapham, Tutin & Warburg (1962) speak of micorrhizal symbiosis in the prothallus. Does the adult plant also depend on a fungal associate? If so, is this specific, or might it be one which could be borrowed from other symbionts such as heather? It seems we desperately need to know more.

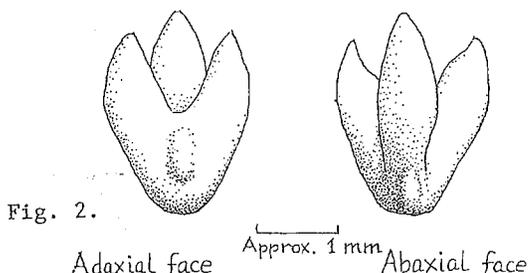
It has been suggested that aspect is of some significance. I have rather come to doubt this. The aspects of the first 21 sites or observations listed in the Summary below are as follows: (i) - unknown; (ii) - mainly S; (iii) - origin unknown; (iv) - W; (v) - NE; (vi) - open; (vii) - SW; (viii) - S; (ix) - N; (x) - S; (xi) - SW; (xii) - E; (xiii) - origin unknown; (xiv) - mostly so shaded as to be immaterial, but, in the case of 2 plants, E; (xv) - N; (xvi) - N; (xvii) - open; (xviii) - NW; (xix) - origin unknown; (xx) - SW; (xxi) - NE. This does not seem to be very conclusive.

There remains the question of propagation with a view to the ultimate possibility of effecting re-introductions. All the species disperse spores and have a life-cycle with a prothallus stage similar to that of ferns. However *Huperzia*, in addition to this, is said to propagate itself mainly or "only" (Clapham, Tutin & Warburg, l.c.) vegetatively, by means of small propagules called "gemmae" in the literature. It would be of enormous advantage to have the results of controlled experiment on optimum conditions for germination and growth, whether of spores or propagules. It might even be possible to by-pass any germination difficulties through tissue culture. Also, as already indicated, it would seem of particular importance to determine whether the sporophyte plant depends on a fungal symbiont, and, if so, what the identity and range of specificity of this might be.

However all this would require high-powered techniques and it is to be feared that the question will not lie very high on the list of priorities. Short of such an investigation little can be done except to rescue and attempt to revive fragments and seek to rear Huperzia propagules. As regards the first, Huperzia fragments can sometimes be persuaded into growth if they already have some roots; in the case of Lycopodium it is not clear whether the occasional adventitious roots will become sufficiently functional to support growth or whether they can only act as (very inefficient!) anchors. I'm currently awaiting the outcome of my attempt to grow on a dislodged, but apparently viable, fragment of Lycopodium found on the moor following uprooting by sheep. Diphasiastrum I have no experience of. As regards detached Huperzia propagules, the season of detachment may be relevant. In August 1989 we found some detached Huperzia fragments on Cader Idris, and I stripped these of propagules immediately. Only three propagules have survived out of about a dozen, and only one has made any growth, to about 8 mm. One of the surviving parent fragments developed fresh propagules this year. I left these until December, by which time they would fall off at a touch. Again I await the result of setting this second batch to root.

The Huperzia propagules or gemmae look like additional rather bright green leaves in the axils of the normal leaves towards the apex of the shoot, and in the mass give a bushy, rather brilliant appearance to the plant. Each is in fact composite. I have not come across an illustration in the literature and so include a sketch of one gemma (fig.2). It consists of three slightly fleshy proto-leaves fused into an undifferentiated base which bears two small stipule-like processes.

### Gemma of Huperzia



Might I end on a query which is only topographically related? The Mallaen inclines very slightly to a summit at the N which bears two tumuli; beyond this, on the brink of the N slope, lies a line of outcrops or crags. The summit tumuli are called Crugiau Merched, and the line of outcrops the translation, Creigiau Ladies: it would seem that at some point, since there are two features, the supposed original name and its translation were irrationally distributed between them. I have heard (though unfortunately I cannot remember how or when) that the basis of the name is Craig Gwladys, and that Gwladys was the wife of (?) Caractacus. The monumental tumuli lend a little plausibility to the suggestion. If this is so, it is the English which is a garbled version of the original and the Welsh is merely a superfluous translation of the misunderstanding. Can anyone confirm this or add anything to it?

## Summary of records from NE Carmarthenshire

The way in which the distribution of the plants is itemised on the list may appear somewhat haphazard. In some cases it might be thought that separate entries belong to what is, or was formerly, a larger whole. The actual entries register the stages by which the plants were discovered.

The following symbols are used on the map:

Circle		= <u>Lycopodium</u>
Square		= <u>Diphasiastrum</u>
Obverse triangle		= <u>Huperzia</u>

An open unbroken symbol  indicates extinct material.

An open broken symbol  indicates lack of information: either a presumed extinction which has not been confirmed because there is no exact locality, or a recent fragment of unknown source.

A shaded broken symbol  indicates material found in or after 1985 which could be thought vulnerable and which has not been monitored.

A shaded unbroken symbol  indicates material which has either been found or monitored recently or which could be supposed to be reasonably safe.

A small symbol indicates either a single plant or a very small colony. A large symbol indicates an appreciable colony. For details see the individual entries.

- (i) 74?P. "Penrhiwiar", all three spp., unlocalised, before 1967 (May's list). Pen-y-rhiw-iar farm is shown as just inside the NW corner of 74T. The whole upper hillside is now under Economic Forestry and any plants in this large area are presumably extinct. In the absence of more detailed information the symbols are sited conventionally on the map; see also (xxvii) and (xxviii) from the adjacent Cribyn du hillside.
- (ii) 74L. Cwm Rhaiadr, all three spp., before 1967 (May's list). In the absence of more detailed information no symbols are inserted on the map; see instead (xxii), (xxiii) and (xxiv) from the same general locality.

The remaining locality for all three spp. in NE Carmarthenshire in May's list, "Mynydd Mallaen", is not further particularised; so far Diphasiastrum and

Lycopodium are concerned it probably indicates (iv) below. (xviii) below is again fairly accessible and will undoubtedly have been much more abundant at the time.

- (iii) 74M. In the late 1960's various detached fragments of Lycopodium were found on the Mallaen. This one was on the E sector of the moor, so far as I can remember, at approximately the position shown.
- (iv) 74G. Extensive colony of intermixed Lycopodium and Diphasiastrum on the steep E hillside above the Gwenlais, running in a broad belt for some hundreds of yards from the sharp corner at 729426 northwards to a scree. Known since late 1960's.

Re-visited regularly, the last time in late 1990 when it seemed stable and was fruiting.

The main associates are Calluna, Vaccinium myrtillus and Empetrum. Blechnum is common, and so are various mosses which I wish I knew better; one, a tantalising lycopod-mimic, I take to be Dicranum scoparium. There is a scattering of Potentilla and Jasione and very sporadic Deschampsia flexuosa, but in general not a great deal to attract sheep. A possible danger is that the hillside might be fired, but as it is difficult of access and would probably be unproductive anyway this seems unlikely.

Mrs Vaughan knew this site, and it is probably one of those intended in the reference "Mynydd Mallaen" in May's list.

- (v) 74A. Isolated Huperzia on bare red earth in a little hillside recess of the kind made (?) or at any rate used by sheep as snugs, beside track sloping NW-wards from the footpath which skirts Rhiw Cilgwyn down to the upper Afon Merchon, c. 717417, April 1985. Subsequently vanished, at least by 1989.
- (vi) 74A. Close to above: extended scattered colony of Huperzia c.717418 along a mostly flat strip of ground bordering the Merchon to the S, in a variety of micro-habitats, wet and dry, May 1985. Difficult to monitor: re-visited once before 1989; in 1989 found to be reduced to a few depauperate plants on an isolated wet outcrop.
- (vii) 74A. Colony of Lycopodium, amongst Calluna, extending over a few yards of steep rocky shoulder in NE angle between the Merchon and its last tributary to the N, c. 715419, roughly opposite the W part of (vi) above, May 1985. Monitoring as for (vi); found to be shrinking, and entirely vanished by 1989.

(viii) 74A. Separate colony of Lycopodium 100 yards or so E of (vii) on steep bank in Nardus - Festuca ovina turf, N side of Merchon. Discovery and monitoring as for (vi) and (vii); vanished by 1989.

(ix) 74H - and I? Extensive scattered colony of Huperzia on steep heavily grazed hillside just N of Crugiau Merched, above Bwlch-y-Rhiw, 1985. Thought to be in 74H, but the H/I dividing line lies close by and is difficult to determine. The hillside is covered with tumbled blocks, and almost all the plants were in crevices between these or, where a block had perched on others, in the cavity underneath, as ferns often do in such circumstances. Not monitored.

(x) 74G. Colony of Lycopodium c. 733423, 1987.

A clear path follows the N bank of the Gwenlais as far as the unnamed tributary which meets the main stream at 734423. The path crosses the tributary and then climbs the hillside diagonally NW, ultimately petering out. Colony (x), comprising some dozen plants, lined the outer edge of the ascending stretch of the path where this is still clearly evident. The plants were entwined in close-cropped Calluna or Erica or under light bracken cover. They seemed to have disappeared in 1990, but recently (Jan. 1991) one has been re-discovered.

(xi) 74G. Scattered colony of Lycopodium, c. 732425, on the same hillside as the above, 1987. The plants grew at a higher level, above the demise of the path. To the SE they were under light bracken; to the NW amongst vigorous Calluna. No trace could be found in 1990, but the area is large.

(xii) 74G. One very large Huperzia at edge of tiny rivulet on W side of Gwenlais which meets the main stream at sharp corner at 729426, 1987. The plant was 50' or perhaps more up from the bottom, deep within a huge growth of heather. It is presumably quite safe; but of course the life-span of individual plants is unknown. A Lycopodium was found a few yards to the N, and may have companions on the same slope.

(xiii) 74F. Detached fragment of Lycopodium S of Merchon, c. 727417, 1987. No source could be seen.

(xiv) 74H. 6 Huperzia along about 100-yard stretch of upper Nant-y-Clun southward from bend at 739457, 1990. Most of the plants hidden below overhanging banks of stream, in genial conditions with Anemone, Viola riviniana, Valeriana officinalis etc.; one, on E bank, below foot of Betula covered with Hymenophyllum wilsonii. 2 most southerly plants on rock face, W side of stream and some 50' above

it, about 100 yards below isolated Sorbus on other side of stream. Not seen again but seemed fairly safe. No plants were seen further down the stream in 74M.

- (xv) 74I. 1 Huperzia in safe but deprived situation in crevice of rock-face about eye-level above ground, Craig Diferion, 1990.
- (xvi) 74H. 1 Huperzia at foot of rocky outcrop ("Creigiau Ladies") N of summit cairn (Crugiau Merched), 723458, 1990; probably a southerly outlier of colony (ix) above, and not given a separate symbol on the map. Unfortunately there was not time on this occasion to monitor the rest of (ix). The plant was fully exposed to the vacuum-cleaners and can hardly survive.
- (xvii) 64Z. Extinct populations of all three spp., 681488.

In recording this tetrad for the Carmarthenshire Flora Survey in 1990 I had great help from Mrs E. Lewis, Pumsaint, and Mrs L. Davies, Abergorlech, both formerly of Blaen-Twrch. As well as knowing the area well, both had had some botanical training as undergraduates. They told me that all three spp. had been widespread around the above grid-reference in 1956/60 and that voucher specimens had been sent to NMW for determination. The site has now been re-seeded, but its original character is preserved within the small cross-shaped plantation nearby. The very rough turf contains Vaccinium oxycoccus, Carex nigra and Juncus squarrosus. Interestingly the site, unlike most of those listed here, is fairly flat and level. Some time was spent searching unimproved grassland in the area without finding any relic of the colony.

- (xviii) 74M. Composite population along E. slope of upper Nant Gelynen valley, mostly in short dry V. myrtilus - E. tetralix - F. ovina turf, seen in 1990, comprising
- (a) extended scattered colony of Diphasiastrum from c. 747456 to 745451;
  - (b) 1 Huperzia amongst Diphasiastrum at c. 747454;
  - (c) 1 (or possibly more than 1) Lycopodium at 745451;
  - (d) 1 Lycopodium in short bracken at edge of wooded area c. 747457;
  - (e) 1 depauperate Huperzia in very dry Galium saxatile - F. ovina turf on steep ridge at 748457, with dead fragments nearby.
- (xix) 74X. Dead fragment of Lycopodium on slope above pool in disused mine area, just below Economic Forestry road, Nant-y-Bai, 788448, June 1990. Of interest in suggesting the possibility of the presence of Lycopodium E of the Tywi. There were traces of wool on the fragment, though of course sheep-carriage does not preclude the

possibility of bird-carriage from a distance at some stage. We walked the length of the Nant Bai and back by the promising-looking open ridge to the N but found no sign of a source. It might at least be thought that such a fragment could hardly be very ancient, for presumably it would be likely to disintegrate over a winter season. It might be worth searching the open hillsides in the direction of Ystradffin.

- (xx) 74G. 1 Lycopodium in Calluna in NE angle between Afon Gwenlais and unnamed N tributary, 734423, beside the footpath mentioned under (x) before this crosses the tributary and starts to climb.

First seen in September 1990. We cannot be sure that it is new, but the path is the regular route to the moor via the upper reaches of the Gwenlais and we must have passed the spot scores of times. It is natural to link the plant with colony (x). The altitude is strikingly low: the site can hardly be more than 500' A.O.D. As it is a natural point of passage both for people and for sheep we constructed a guard of pegged branches. At the time of writing (January 1991) both this and the plant are intact.

- (xxi) 64Q. Huperzia "in recesses of rocks" of Carn Fawr, 669503, A.P. Fowles, August 1987, reported in BSBI Welsh Bulletin, No. 50, Winter 1990.

- (xxii) 74L. Composite population W of Craig y Rhaeadr comprising (a) 1 Lycopodium beside small outcrop, 756434;

(b) 5 Huperzia, S face of large dry gully, the height of a large tree down from the skyline, in heather-brush on slanting strata, with small colony of Diphasiastrum a little higher and further S on sloping turf, 755437;

(c) A little to N, at edge of steep descent to waterfall on a level with upper branches of ivy-covered Sorbus, 10 small Huperzia; plus 3 more below tree, in heather, near small flat area beside river. Again 755437.

- (xxiii) 74L. Extended colony of Diphasiastrum E of and parallel with unnamed N tributary of Nant y Rhaeadr, among Vaccinium, Empetrum and Calluna above and below well-marked sheep track, 755439.

- (xxiv) 74L. Scattered population of Huperzia and Diphasiastrum along S bank of Nant y Rhaeadr above waterfall, comprising

(a) scattered Huperzia (1 very large, in deep shade at eye-level under heather on large ivy-covered outcrop) E and W of sheepfold on W side of small unnamed S tributary, with small Diphasiastrum colony W of sheepfold, 753438;

(b) 1 large Huperzia at edge of Nant y Rhaeadr, 752439;

(c) small Huperzia colony near lone Betula at junction of 2nd unnamed S tributary, including 1 large plant under heather on outcrop just above tree, and c. 8 more, rather depauperate, in exposed flush at slightly higher level, 751439.

I am most grateful to Mr David Davies for sparing the time to show me the plants at (xxiii) and (xxiv), which I had not known before.

(xxv) 74L. A few small Huperzia in exposed flush amid very scanty Nardus and E. tetralix on slope above S bank of Nant Rhosan and in cleft just below, with 4 more just to E in moss humus on steep damp rocks exactly opposite unnamed N tributary, 750429.

(xxvi) 74I. Small colony of intermixed Lycopodium and Diphasiastrum, with 2 isolated Huperzia, in cropped Vaccinium - F. ovina turf at edge of steep descent, Craig Llŷs-fedw, 739462. (E of Craig Diferion.)

(xxvii) 74P. Small colony of Huperzia on NW side of unnamed S tributary of Afon Pysgotwr just beyond boundary fence of wooded area, including 1 large plant in recess under N end of horizontal slab colonised by Racomitrium and Polytrichum spp. on NW side of gnarled Hawthorn beside waterfall, with 5 smaller plants in turf or moss humus scattered a few paces below, 759485.

(xxviii) 74P. Cribyn du, SW bank of Afon Pysgotwr. As approached from the SE, the first part of the slope below the Cribyn du crags is bracken-covered and unpromising, and this is followed by extensive bare scree. There was not time to examine the crags above, which are unexpectedly well wooded, or to proceed further than 753489. The fruitful area was mostly found to be beyond the scree, perhaps 200' up from the Pysgotwr, around the unnamed S tributary at 755487. This tributary is double, running in two parallel channels. A composite population was seen, comprising

(a) a fairly extensive colony of Diphasiastrum, mixed with some Huperzia, in short Vaccinium - F. ovina turf on open hillside some 20 paces W of W channel;

(b) some 15 Lycopodium at same level, in disjunct patches, a few plants just to W of W channel, the remainder between the channels on poor mixed substrate, plus a few additional patches of Lycopodium between the channels at a somewhat higher level (the indication of

this population on the map is misleading: by comparison with others it is now considered that the symbol should be large);

(c) many scattered Huperzia in short turf between two very large slanting exposures of strata E of E channel;

(d) 3 outlying Huperzia to NW: 2 plants below crag beside Pysgotwr opposite hugh Ilex at 753489; 1 plant on large isolated outcrop diagonally up hillside to the S.

The following promising localities were searched without finding specimens:

74M. Craig Beynon, edge of steep descent, 752450.

74M. Craig Troed-y-rhiw-fer, edge of steep descent, 759450.

The following localities of former records near to the present (xxii) and (xxiii) (R.G. Woods, 1980) were searched without finding any specimens:

74L. Huperzia, 754436. The site is a gentle turf slope with occasional bracken amid frequent outcrops, heavily grazed.

74L. Lycopodium and Diphasiastrum, 753433. The site is a long gentle slope now heavily encroached upon by bracken.

Lastly it has unfortunately not been possible to monitor the following old record:

Lycopodium clavatum, Carmarthenshire, Caeo, Pigyn Sion Nicholas, 22/66-35-, 1848, William Davies, in I.K. Morgan in BSBI Welsh Bulletin No. 47: 18-19 (Spring 1989).

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## TRAINING PLANTS IN GLAMORGAN

The Victorian slaves built the railways west of Cardiff reaching the Swansea area by the early 1850's. Since then this network has offered an area rich in wild flowers which is in a continuous state of flux mainly due to the actions of man.

With a proportional increase in the number of motorised field botanists, both amateur and professional, particularly during the 1980's, large tracts of these lines and adjoining land are being neglected by many recorders throughout the British Isles because they remain undetected from cars or are in inaccessible areas.

### Introduction

A survey of rural and semi-rural habitats on the existing British rail network took place between 1977 and 1981 (Sargent). The Rutland rail network was surveyed on a tetrad basis (Messenger) and pteridophytes were recorded in a railway closed for maintenance near Chepstow (Dyce). There has been much interest in recording plants along disused railways (Jones; Somerville). However, all these surveys were on foot. Records obtained while in moving cars and a jumbo jet have recently been briefly reported (Badmin; Leach; Scott; Ellis ed.), also indicative of the decline in rail travelling recorders.

However records made from a moving train are rarely reported. Field outings certainly used to start and end on the train as was often mentioned in the field meeting reports of the Swansea Scientific Society (eg. Jackett, 1894) and to some extent this kind of meeting was re-enacted in 1986 on the BSBI sesquicentenary excursion (Burt). The Rev. H.J. Riddelsdell must have travelled on the rail network from Aberdare, guiding ... 'a botanical excursion to Port Talbot docks and Britonferry' in 1905 - 'Railway Fare - 2nd Class Return [from Swansea] 2/6' (Pontifex & Lewis). On a train from Swansea to a field meeting in the Llyn Fach area 'Epilobium angustifolium and Linaria repens were seen at intervals along the Vale of Nedd [Neath] branch of the G.W.R. line' (Anon. 1914). What can be seen in the Rheidol valley by passengers on a narrow gauge railway (Young ed.) is the best example in Wales of observing nature from the train. Throughout the 1980's it was possible for me to record plants and locate potentially interesting sites from a moving train for the 'Flora of Glamorgan' survey, which used a 5-km recording unit. But how does one record from a high speed Intercity 125 train travelling at over 70 m.p.h. and overtaking speeders on the adjoining M4 motorway? The techniques used are explained here, essentially in the order required.

## Techniques

Preparation for the journey the day before has to be part of the enjoyment. Pocket train timetables are essential. Optional times of departure for the return journey are circled in red. After assessing the isobarred television chart and concluding there will be no interfering rain the next day, the expedition is on.

The relevant OS maps (1:50000) are chosen and the boundaries of the recording units used in the survey work are marked clearly on the maps with a blunt HB pencil, but only where they intersect the railway line. This saves valuable seconds on the train and only have to be drawn in once over the duration of the survey. In time one gets to know the boundaries.

Many records are from random observations but as most plants have peak flowering times it is possible to choose the species one wishes to scan for. If distributions are already known, squares where they have not been recorded are marked with a lower case code letter, for example 'b' for Buddleja davidii, where the railway enters the square, enabling target squares to be detected rapidly on the moving train. Once seen the species is marked on the map where it occurs in the square with the corresponding capital code letter. One can then relax until the next target square.

The data is processed from the maps at one's leisure, after which the pencilled records can be rubbed out. Using this technique it has been possible to scan for Buddleja davidii, Foeniculum vulgare, Hirschfeldia incana, Lathyrus latifolius, Linaria repens, L. vulgaris, Picris hieracioides and Verbascum thapsus, but it was Pastinaca sativa which had the highest number of new 5-km squares. In the first half of May a peak of Crepis vesicaria occurs which flowers before Crepis capillaris. After flowering, plants were visited near Bridgend and achenes checked for general ratification of these records. In spring Galanthus nivalis, Primula vulgaris and P. veris are easy targets. The valley lines north to Merthyr Tydfil gave a few sightings of Lunaria annua, mostly on the banks of cuttings below terraced houses above the twisting River Taff. Arabidopsis thaliana has been recorded from most railway halts north of Pontypridd.

A small pencil and note card should be in one's possession at all times. I use 6" x 4" record card, ruled both sides, which is folded vertically making four pages with two columns per page. The pages are marked 11,12,13,14 with the date and general destination in the top right hand corner. The next card is numbered 21,22,23,24 as required etc. Pencil sharpener essential. Waiting for a train can have its exciting moments with long stretches of Intercity platforms to explore including the flower beds and gaps between the paving stones. Valerianella carinata was recorded in this way in a raised flower bed at the west end of platform 3, Cardiff Central, ST17, with Rumex

acetosella at the other end, probably brought in with peat compost, and an uncommon plant for central Cardiff. Arabidopsis thaliana, Saxifraga tridactylites, Cochlearia danica, Erophila verna, Sagina procumbens, Poa annua, Vulpia bromoides and V. myuros are the usual ones sought and all have been found at various Glamorgan railway stations; Pontardulais station (SN 50), the only one in Glamorgan on the Central Wales line, being particularly rich.

Positioning oneself in the correct seat on the train is essential for efficient recording. Rear and front coaches are favoured because when the train stops at a station the less frequented areas containing the most flowers can be observed. A seat facing the front of a train is best because this results in the earliest detection of an oncoming plant, allowing one to maximise the observing time by turning one's head as one stares at the plant passing by. On double tracks the time spent can be exchanged by sitting on the right hand side as it gives a wider field of view across a whole width of track. Do not sit with the sun in your eyes. Unanticipated stops due to signals or breakdowns are to be exploited.

Three classes of train operate in Glamorgan. The old blue diesel multiple unit offers the best views with the Intercity 125 a close second but the latter has better suspension for taking notes. The smoothest ride is on the new Sprinter train, but alas it gives poor views with few seats aligned with the windows which are too high up to see along the railway cress (the free draining area of chippings) and the adjoining verge. It is more suitable for writing draft articles, such as this one, during the lean months.

Working out one's location from a moving train is essential as the record is worthless without a grid reference. If an OS map is not at hand, first of all note what stations one is between. Look for useful features in the landscape that would be marked on maps. Pylons and bridges are useful, noting the angle of dissection to the line by means of a small diagram. Farms close to the line, streams, adjoining roads and woods are also useful. The compass direction, or if that can't be worked out, the direction to the next station should be marked on any diagram to avoid inversion. Another useful technique is to note the next yellow quarter mile post. These are on the right hand side of the line heading west from Paddington. On the main line through Glamorgan the figure represents miles west of Paddington with |, || and ||| referring to  $\frac{1}{4}$ ,  $\frac{1}{2}$  and  $\frac{3}{4}$  of a mile respectively. This method comes into its own in nondescript countryside especially if one wishes to relocate the plant on the return journey. Distances between stations are given in a helpful recent booklet (Oakley).

At the advanced stages of a flora survey many ubiquitous species needn't be noted. Large numbers of plants cannot be determined from a moving train but they can often be detected as can sites

with some potential. These plants and areas can be noted and revisited at a later date, or as has often been the case, on the same day especially if it is within walking distance of a station. Breaking one's return journey for an hour is the usual technique. Many new 10-km square records have been found in this way including Nymphoides peltata and Hieracium strumosum at the Swansea West Loop, SS69. One of the best unexplored sites discovered from the train was the Bridgend Industrial Estate, SS97, described below, where an abundant yellow composite was initially investigated turning out to be Picris hieracioides.

Changing trains can allow time to explore derelict land close to the railway station. In this way Verbascum pulverulentum, Rumex frutescens, and Nigella damascena have been found near The Strand below Swansea station, SS69.

### A Train Journey Through Glamorgan

The plants mentioned here cover the whole year so could not be seen on one journey. All were recorded or detected in the 1980's and most were new 5-km square records.

Cardiff Central has a new set of weeds in the raised flower beds earlier in the year before replanting and again in the autumn. Verbascum thapsus thrives on the cinders around the Canton depot, ST 17. Here the line branches to Penarth and Barry Island. Banks of Centranthus ruber showing the pink, red and white colour forms occur at Cogan, ST 17. Ranunculus peltatus can be seen in flower in small pools on the flood plain of the Cadoxton River, SW of Dinas Powis, ST 17. The old brick walls of Barry Island station, ST 16, provide refuge for several species of fern including Pteridium aquilinum. Nearby Little Island has Orobanche hederæ along its northern shore, with Viola canina (det. D.M. Moore) in the short coastal turf around the old coastguard station, at its only extant site in east Glamorgan.

But back to the main line which continues westwards hugging the River Ely. Salix triandra x S. viminalis (S. x mollissima) (Meikle) has not been refound around Ely Bridge, ST 17. There are old exsiccata of Miss E. Vachell's at K and NMW. Maps and old photographs located at Cardiff Central Library indicate that since 1904, bridge rebuilding, the destruction of a willow-clad eyot and considerable urbanisation have taken place. Salix fragilis and S. x sepulcralis nothovar. chrysocoma (Weeping Willow) now dominate.

A splash of yellow seen in late summer along an adjoining disused railway track west of the St. Fagan's level-crossing, ST 17 proved to be Hieracium vagum (first confirmed record for Glam.), H. umbellatum subsp. umbellatum, at its closest site to Cardiff, and H. perpropinquum, all det. J. Bevan. Here a winter-flooded area to the south of the line is white with Ranunculus peltatus in early summer. Hesperis matronalis, ST 17, and Armoracia rusticana, ST 17, are easily identified from a train. Flushes of

blue along wooded streams at the base of small railway embankments are stands of Aconitum anglicum, a plant widespread along the Ely valley, ST07, at its Welsh stronghold and now an SSSI.

The small industrial towns in the Vale of Glamorgan are worthy of further exploration. A brief revisit to the Tyle-garw level-crossing area, ST 08, gave Pisum sativum. Disused coal sidings at Bryncae, Llanharan, SS98, can be yellow with Hieracium but access is restricted.

The large industrial estate, SS 97, dominates the approach to Bridgend. Here unused areas have reverted to nature. Stands of Dactylorhiza maculata subsp. ericetorum with Primula veris, and Lathyrus nissolia, in one tall grassy area were some of the surprises. Cardaria draba, Hippophae rhamnoides, Hirschfeldia incana, Lactuca serriola, Papaver lecoqii, Leycesteria formosa occurred on disturbed ground. Close to the station, Lias limestone cuttings have fine stands of Primula veris around the unusual two-storey hexagonal pillbox, with Ribes sanguineum, Clematis vitalba and Rheum rhaponticum (Rhubarb) seen in full flower on the vertical faces.

Taxus baccata is a feature of a small wooded slope NW of Bridgend, SS88, seen while approaching Court Colman, a 19th century mansion house now a floodlit hotel. I found it odd that the local endemic Hieracium radyrense, referring to Radyr nr Cardiff, could have been determined from the Bridgend area as well. (Perring & Sell eds.). The material collected was from Court Colman and while Jim Bevan examined the specimens at CGE, I was able to relocate it growing on old walls. It was clearly different from H. radyrense, one feature being that it flowers in early June whereas the Radyr endemic flowers in mid July. The plants maybe related to the Hieracium exotericum agg. An embankment of the bridge over the railway to the west has Fallopia sachalinensis fuelled by the farm dung heap.

Stable grassy dunes around the stump of Kenfig Castle have yielded little but as the train passes the unseen largest area of open water in Glamorgan (Eglwys Nunnydd reservoir), Port Talbot steelworks is approached, SS 78. The spread of Hirschfeldia incana through Glamorgan in the 1980's is apparent here with yellow flanks of this crucifer along the verges. Its long racemes are easily detected in areas of disturbed soil and waste ground. Further recording is required to monitor its spread and all records are welcome. The dark arboreal screen of the steel works containing planted Populus and Cotoneaster is lit up for many months of the year by the large bright yellow flowers of Spartium junceum (Spanish Broom).

Dykes between Port Talbot and Neath (Baglan Moors, SS79) are rich with Iris pseudacorus. The small artificial Baglan Pool, which turns green with algae in high summer, can produce high Mute Swan counts, sixty have been recorded. Delightful wooded slopes of

Craig-y-darren above Briton Ferry beckon Neath station, SS 79, where Sisymbrium orientale was growing among the paving stones. Cytisus scoparius is spreading along the cess in this area. Lathyrus latifolius adorns the embankment above the old Neath Grammar School but noticeably not every year.

The train now races through the cuttings of Skewen with fleeting glimpses of Japanese Knotweed-filled graveyards. Brunel's arches, SS 69, guard the entrance to the Swansea Valley and are surrounded by Calluna vulgaris and Erica cinerea with Hieracium strumosum on the brickwork. This heather community is a feature of many steep slopes on the eastern side of Swansea.

Now the view suddenly opens up to the broad basin of the Lower Swansea Valley, SS 69. Sadly, much of the recolonised metal-wastelands are being replaced by new roads with much featureless landscaping now in evidence. This prompted a brief visit to the area in the late 1980's when new records were obtained for Cotoneaster dielsianus, and C. simonsii (det. J. Fryer), Rhus typhina, Hesperis matronalis and Lolium multiflorum, a grass of the re-seeded landscape.

The approach to Swansea station is dominated by the dark heather-clad slopes of Kilvey Hill which turns pink in late August. Another unusual siting for Pteridium aquilinum was indoors at the concourse to Swansea station where it grew out half way up a drain pipe for many years reflecting the stations Victorian origins.

Over the past decade it has been possible to observe the ever changing flora of the Glamorgan rail network, none more so than between Swansea and Gowerton. Fallopia japonica has overrun hill slopes, large banks and graveyards around Cockett tunnel. A small artificial pool before the tunnel, SS69 once choked with Nymphaea alba or one of its cultivars. This surface feature is now confined to a small area in a corner of the pool due to the arrival of Nymphoides peltata which now dominates; yet another example of aquatic competition; compare Elodea nuttallii, Lemna minuscula and Crassula helmsii. New records of Nymphaea alba need to be treated with caution, as there are about 200 cultivars to date according to a recent television programme from Wakehurst Place in Sussex. Daylight again at the end of the tunnel with old pink rose cultivars at overgrown Cockett station, recalling steam days of the 50's. It is downhill from here with the view northwards across to Fforestfach dominated by ever spreading Ulex europaea. To the south a delightful heathland pool is passed on the edge of Gower with Drosera rotundifolia, Narthecium ossifragum and Eriophorum angustifolium. Once the low-angled light of the setting sun tricked me into thinking I may have passed a stand of Pitcher plants here, the heads reflecting the light, but the next day time scan in the shortening days of summer revealed the glossy capsules of Iris pseudacorus! In the 1970's I noted three plants of Cytisus scoparius at Gowerton

station, SS 59, this too has spread, forming a narrow band for a few hundred yards east of the station and spreading into the tall Ulex.

In the distance is the wooded valley of the Afon Llan, SS 69, in the historic Penlleger estate with its large dried up lake. A visit in 1990 gave new sites for Narcissus pseudonarcissus, Scirpus sylvaticus, Sasa palmata and Polystichum aculeatum forma cambricum with mature sori. As the train speeds downhill to Loughor, SS 59, on what is now a single-track main line, Melilotus alba still survives on the edge of re-seeded former salt-marshes. There is much recent disturbance at Leucorum (Roman Loughor) with the building of a modern Roman road which needs to be scanned. Finally, the train belts across the waist of the River Loughor to enter the largest vice-county in Wales - but that's another story.

#### Acknowledgement

I am grateful to staff at Llanelli Reference Library for a selective computer search of railway references, some of which are cited here.

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G. Hutchinson

## WELSH PLANT RECORDS - 1988

Welsh Plant Records are compiled by R. Gwynn Ellis, Dept. of Botany, National Museum of Wales, CARDIFF CF1 3NP, from reports of BSBI vice-county Recorders to whom records should preferably be sent. Plants are listed for each county in the order of Dandy's *List of British Vascular Plants* (1958), the number in that list preceding the name, so that names recently changed can be used without giving the former name. However, for the critical genera *Rubus*, *Hieracium* and *Taraxacum*, the species numbers follow more recent works viz: *Rubus - Brambles of the British Isles*, Edees & Newton, 1988, *Hieracium - Sell & West in Critical Supplement to the Atlas of the British Flora*, F.H. Perring, 1968, and *Taraxacum - C.C. Haworth's typescript, An Annotated List of British and Irish Dandelions*, 1988. English names are those in *English Names of Wild Flowers* ed. 2 (1986) by Dony et. al.

The following symbols are used:

\* to indicate a new v.c. record.

+ to indicate a new 10km square record.

! to indicate that the species is not native to Wales.

\$ to indicate a species which, though native in some parts of Wales, is not so in the locality recorded.

[ ] to indicate that the record, previously published in error, should be deleted.

Where entries consist of one record only, the symbols appear before the species number: where entries consist of more than one record, the symbols appear before each record, except for the ! sign which, if required, is always placed before the species number.

In general only those records which are additional to those given in *Flowering Plants of Wales* by R.G. Ellis (1983) are included. Other records are included at the discretion of the vice-county Recorder.

The Vice-County Recorders from 1/1/1990 are:

MONMOUTH, v.c. 35; T.G. Evans, La Cuesta, Mounton Road, Chepstow, Gwent NP6 5BS.

GLAMORGAN (West), v.c. 41; Dr Q.O.N. Kay, Dept. of Botany, University College, Singleton Park, Swansea, West Glamorgan SA2 8PP.

GLAMORGAN (East), v.c. 41; J.P. Curtis, 12 St Lythan Close, Dinas Powys, South Glamorgan CF6 4UB.

BRECON, v.c. 42; M. Porter, Aberhoywy Farm, Cyffredyn Lane, Llangynidr, nr Crickhowell, Powys NP8 1LR.

RADNOR, v.c. 43; Dr D.R. Humphreys, Knill Court, Knill, nr Presteigne, Powys LD8 2PR.

CARMARTHEN, v.c. 44; R.D. Pryce, Trevethin, School Road, Pwll, Llanelli, Dyfed SA15 4AL.

PEMBROKE, v.c. 45; S.B. Evans, Glan-y-Mor, Dinas Cross, Newport, Dyfed SA42 0UQ.

CARDIGAN, v.c. 46; A.O. Chater, Windover, Penyrangor, Aberystwyth, Dyfed SY23 1BJ.

MONTGOMERY, v.c. 47; Mrs M. Wainwright, 'Troy', 1 Green End, Oswestry, Shropshire SY11 1BT.

MERIONETH, v.c. 48; P.M. Benoit, Pencarreg, Barmouth, Gwynedd LL42 1BL.

CAERNARFON, v.c. 49; N.H. Brown, Treborth Botanic Garden, University College of North Wales, Bangor, Gwynedd.

DENBIGH, v.c. 50; Mrs J.A. Green, Coed Duon, Tremerchion, St Asaph, Clwyd LL17 0UH.

FLINT, v.c. 51; G. Wynne, Gwylfa, Lixwm, Holywell, Clwyd.

ANGLESEY, v.c. 52; R.H. Roberts, Quinton, 51 Belmont Road, Bangor, Gwynedd LL57 2HY.

Monmouth

MONMOUTH, v.c. 35 (comm. T.G.Evans)

+21/2aff. *Dryopteris affinis* (Lowe) Fraser-Jenkins subsp. *affinis* (a scaly male-fern). Bank of shaded sunken lane, NW of Pontllanfraith, ST1696, G.Hutchinson, 1988.

+22/1. *Polystichum setiferum* (Forsk.) Woynar (Soft Shield-fern). Bank of shaded sunken lane, NW of Pontllanfraith, ST1696, G.Hutchinson, 1988.

+24/5. *Gymnocarpium robertianum* (Hoffm.) Newman (Limestone Fern). Cleft, limestone rocks, Pwll-du, SO2511, R.Fraser, 1988. One of only two sites in Gwent.

40/1. *Aconitum napellus* L. (Monk's-hood). Hundreds of plants in wet meadow near Holy Well, Goetre, SO3005, R.Fraser, 1988.

+46/7. *Ranunculus sardous* Crantz (Hairy Buttercup). Farm gateway, Raglan, SO40, D.Lewis, 1988.

46/23. *Ranunculus baudotii* Godr. (Brackish Water-crowfoot). In seasonal pool, River Severn meadow, Mathern, ST5390, Dr A.Jacks, 1988. Increasingly diminishing in drained and overgrazed coastal saltmarshes and meadows.

+58/3. *Papaver lecoqii* Lam. (Yellow-juiced Poppy). Spoil heaps, bank of River Usk near George Street Bridge, Newport, ST3287, T.G.& U.T.Evans, 1988. Second record.

115/14. *Hypericum elodes* L. (Marsh St John's-wort). Roadside ditch and neighbouring wet slope S of Tredegar, SO1406, T.G.& U.T.Evans, 1988. Under threat from Council ditch cleaning and economic forestry activities.

+123/6. *Silene gallica* L. (Small-flowered Catchfly). Numerous plants on waste ground on building site near George Street Bridge, Newport, ST3287, T.G.& U.T.Evans, 1988.

\*156/lon. *Atriplex longipes* Drejer (Long-stalked Orache). River Wye below Chepstow, ST5393, M.A.R.& C.Kitchen, 1988. First record.

!168/4. *Geranium versicolor* L. (Pencilled Crane's-bill). Grassy roadside verge NW of St Arvans, ST5097, T.G.& U.T.Evans, 1988. Population described by Dr W.A.Schoolbred in *The Flora of Chepstow*, 1920, as 'established for over 60 years'.

\*171/3. *Impatiens parviflora* DC. (Small Balsam). Twyn Lane, Glascoed village, SO3301, R.Fraser, 1987. Numerous plants scattered along lane. First record.

185/1. *Genista tinctoria* L. (Dyer's Greenweed). Bank of River Wye near Wye/Severn Bridge, ST5390 & ST5491, Dr A.Jacks, 1988.

206/9. *Vicia orobus* DC. (Wood Bitter-vetch). Patch on scrapyard heath, Blackwood, ST1696, Dr N.Horton; also minor roadside bank, Llanhilleth, SO2101, R.Fraser; meadow ditch, Cwm Celyn, SO20E, M.Davies, all 1987; hayfield, Cwm Sychant, SO2404, R.Hewitt, 1988.

Monmouth

+!212/7. *Potentilla recta* L. (Sulphur Cinquefoil). Several plants on landscaped coal tip at edge of River Rhymney, distant from habitation, Cymysflog, SO1502, T.G.& U.T.Evans, 1988. Second record.

\*!220/12. *Alchemilla mollis* (Buser) Rothm. (Robust Lady's-mantle) Roadside in rough grass, Tredegar, SO1309, T.G.Evans & J.Killick, 1988. First record.

+!227/2. *Cotoneaster simonsii* Baker (a cotoneaster). Growing with *Cotoneaster frigidus*, see below.

+!227/3. *Cotoneaster horizontalis* Decne (Wall Cotoneaster). Growing with *Cotoneaster frigidus*, see below.

\*!227/5. *Cotoneaster frigidus* Wall. ex Lindl. (a cotoneaster). In a rough grassy area containing *Dactylorhiza praetermissa* and the above two species of *Cotoneaster*, Cwmtillery, SO2204, R.Fraser, 1988. First record.

\*!319/16. *Euphorbia cyparissias* L. (Cypress Spurge). Small patch spreading on bank of River Sirhowy, Beaufort, SO1610, R.Fraser, 1988.

!325/9. *Rumex cristatus* DC. (Greek Dock). Rough river meadows and wasteland where it is abundant and hybridizing with *R. obtusifolius* L. (*R. x lousleyi* D.H.Kent) in Rumney area of Cardiff near the Rivers Severn and Rhymney, ST2177, 2178 & 2179, T.G.& U.T.Evans, 1988.

\*325/18. *Rumex maritimus* L. (Golden Dock). Disturbed ground with artificial pond and reens close by, Duffryn near Newport, ST2984, G.Hutchinson, 1988. First record.

+!331/1. *Ficus carica* L. (Fig). Base of wall over stream, Garndiffaith, SO2604, R.Fraser, 1988. Second record.

\*!336/2. *Alnus incana* (L.) Moench (Grey Alder). One plant growing in hedgerow along B4596 S of Llanbadoc, ST3798, T.G.& U.T.Evans, 1988. First record. Now planted widely to hide landscaped coal tips.

\*!336/cor. *Alnus cordata* (Loisel) Loisel (an alder). One plant growing with the above in hedgerow along B4596 S of Llanbadoc, ST3798, T.G.& U.T.Evans, 1988. First Welsh record. Also planted in Newport in D.I.Y store car park.

342/4. *Populus nigra* var. *betulifolia* (Pursh) Torrey (Black Poplar). Nine trees discovered in six sites with possibly two more young trees but leaves out of reach and trunks too young to show bosses; two trees with missing branches near railway line, Penpergwm, SO3210, T.G.Evans, 1986; one tree in field near 'Moor road', St Brides Wentlooge, ST3083, T.G.Evans & Recorder group, 1988; one tree at corner of road just SW of Llanwenarth Church, SO2714; one tree badly pollarded on roadside (A40T) opposite Pysgodlyn, SO2615; one tree near River Usk, SE of Mardy Farm, SO21615; and three trees just W of Tyrewen, SO2515, all R.Fraser, 1988. Few of the trees are in perfect condition due to storm damage or the attention of man.

\*356/1. *Calluna vulgaris* (L.) Hull var. *hirsuta* S.F.Gray (Heather). Scattered plants NW of Blaenavon, SO2409, R.Fraser, 1988. First record of this variety.

Monmouth

\*!Pha/tan. *Phacelia tanacetifolia* Benth. (Tansy-leaf Phacelia). Bank of earth against building, Horsington Square, Abergavenny, SO21X, R.Fraser, 1988, det. A.J.Akeroyd. First Welsh record.

!425/3. *Mimulus moschatus* Dougl. ex Lindl. (Musk). Many plants by rail track and wet ditch near abandoned coal pit, Llan-dafal, SO1803 & 1804, T.G.& U.T.Evans, 1988; many plants in wet ditch, Cwm Celyn, SO2008, R.Fraser, 1987.

\*!425/cupx1x2. *Mimulus (cupreus x M. luteus) x M. guttatus* (a hybrid monkey-flower) Many plants in River Rhymney in both v.c. 35 & v.c. 41, SO1008, T.G.& U.T.Evans, 1988, det. A.J.Silverside. First record.

435/1/17. *Euphrasia arctica* subsp. *borealis* (Townsend) Yeo (Arctic Eyebright). Robust, glabrous form, grassy area S of Brynmawr, SO11V, T.G.Evans, 1987, det. A.J.Silverside.

459/3. *Stachys arvensis* (L.) L. (Field Woundwort). During the six years of the v.c. 35 Mapping Scheme, it has been recorded in 36 tetrads in 15 10km squares, usually in small numbers, but a large population was recorded near Llantilio Crossenny, SO3814, R.Fraser, 1988.

+487/1. *Sambucus ebulus* L. (Dwarf Elder). Line of plants on the E bank of River Usk near George Street Bridge, Newport, ST3287, T.G.& U.T.Evans, 1988. First 10km square record since 1930 of this diminishing species.

\*!509/3. *Petasites japonicus* (Sieb. & Zucc.) Maxim (Giant Butterbur). A square metre of the plant on the bank of Berthin Brook, a short distance NW of its confluence with the River Usk, Usk College of Agriculture, SO3701, C.Titcombe, 1988. First record.

\*!Tag/min. *Tagetes minuta* L. (Dwarf Marigold). Two plants, 15 & 23cm high, on hardcore, at back of derelict workshop, Crindau, Newport, ST38E, T.G.& U.T.Evans, 1988. First Welsh record.

+558/1/158. *Hieracium diaphanum* Fries (a hawkweed). Open woodland path, Cilfeigan Park, SO3500, T.G.& U.T.Evans, det. J.Bevan.

558/1/151. *Hieracium subamplifolium* (Zahn) Roffey (a hawkweed). +Dockside, Newport, ST38C; +also hedgebank near Bettws Newydd, SO30S; +and near scrapyard heath, Blackwood, ST1696, all T.G.Evans, 1988, det. J.Bevan.

\*558/1/152. *Hieracium lepidulum* (Stenstrom) Omang (a hawkweed). Grassy roadside bank, SW Bettws near Newport, ST29Q, T.G.Evans, 1985, det. J.Bevan. Third Welsh record.

558/1/199. *Hieracium scabrisetum* (Zahn) Roffey (a hawkweed). +Roadside bank, Little Oak, Parc Seymour, ST49B, 1982; +heathy bank, Cwm, SO10W; +roadside wall near Rogerstone Golf Course, ST28U; +stone rail-bridge, below Markham, SO10Q; +heathery bank, Tredegar, SO10J, all T.G.Evans, 1988, det. J.Bevan. First post 1930 v.c. records.

563/2. *Alisma lanceolatum* With. (Narrow-leaved Water-plantain). In Monmouth - Brecon canal, Rogerstone, ST28U; +and Risca, ST29K, both T.G.& U.T.Evans; +Llanfoist, ST21R, C.Titcombe & R.Fraser; +Goetre,

Monmouth / Glamorgan

abundant, SO30C, R.Fraser; Llanover, SO30E, J.Jones & R.Fraser, all 1988. Other sites occur in reens near the River Severn.

+638/1. *Platanthera chlorantha* (Cust.) Reichb. (Greater Butterfly-orchid). 30-40 plants on hilly meadow, Parva Springs, Tintern, SO5200, R.Woolfson & E.Wood, 1988.

+667/1alt. *Molinia caerulea* subsp. *altissima* (Link) Domin (Purple Moor-grass). Wet heath, Llandegfedd Reservoir, ST39J, T.G.Evans, 1987. Second record.

\*670/6x672/3. *Festuca rubra* L. s.l. x *Vulpia myuros* (L.) C.C.Gmelin (a hybrid fescue). Waste ground, bank of River Usk, Newport, ST3287, T.G. & U.T.Evans, 1988, det. C.A.Stace. First v.c. and second Welsh record.

+!683/4. *Bromus inermis* Leyss. (Hungarian Brome). Waste ground in Industrial Estate, Trethomas, ST18, T.G. & U.T.Evans, 1988.

708/4. *Alopecurus aequalis* Sobol. (Orange Foxtail). Pond margin, Moorcroft, SO5109, J.Harper; and also in quantity at 'bay' at N end of Llandegfedd Reservoir, SO3300, R.Fraser, both 1988. A new 10km square and new site for this uncommon grass.

GLAMORGAN, v.c. 41 (comm. Q.O.N.Kay & J.P.Curtis)

\*15/5stri. *Asplenium trichomanes* L. subsp. *trichomanes* (Delicate Maidenhair Spleenwort). Bare rock at base of cliff, Graig-fawr, Rhondda, SS9296, G.Hutchinson & P.Jones, 1985. First record for subsp.

+21/2aff. *Dryopteris affinis* (Lowe) Fraser-Jenkins subsp. *affinis* (Scaly male-fern). Hedgebank in lane on edge of wood, 1.2km S of Ystrad Mynach, ST1492, G.Hutchinson, 1988.

+21/2bor. *Dryopteris affinis* subsp. *borreri* (Newman) Fraser-Jenkins (a scaly male-fern). Hedgebank along lane on edge of wood, E side of Coed Llanbradach, ST1492, G.Hutchinson, 1988

\*21/2cam. *Dryopteris affinis* subsp. *cambrensis* Fraser-Jenkins (a scaly male-fern). Stream gully, Bwlch y Clawdd, SS99, C.R.Fraser-Jenkins, 1988. First record.

+22/2x1. *Dryopteris* x *complexa* Fraser-Jenkins (*D. affinis* x *D. filix-mas*) (a hybrid male-fern). Deciduous wood on hillside, Forest Ganol near Tongwynlais, ST1483, G.Hutchinson, 1988.

+!58/6. *Papaver somniferum* L. (Opium Poppy). Waste ground, Mountain Ash, ST09; J.P.Curtis, 1988.

+72/1. *Diplotaxis muralis* (L.) DC. (Annual Wall-rocket). Base of wall, Trehafod, ST09, J.P.Curtis, 1988.

+!131/3. *Cerastium tomentosum* L. (Snow-in-Summer). Roadside, Ynysybwl, ST09, J.P.Curtis, 1988.

+169/3. *Erodium cicutarium* (L.) L'Her. (Common Stalk's-bill). Slag heap, Mynydd y Cymmer, ST09, J.P.Curtis et al., 1988.

Glamorgan

- +!170/6. *Oxalis articulata* L. (Pink-sorrel). Waste ground on old railway track, Penrhos Junction, ST1385, A.D.Tipper, 1988.
- +192/19. *Trifolium fragiferum* L. (Strawberry Clover). Saltmarsh, Aberthaw, ST06, J.P.Curtis, 1988.
- +!226/7. *Prunus laurocerasus* L. (Cherry Laurel). Wood near Moulton, ST06, J.P.Curtis, 1988.
- +!320/20. *Reynoutria sachalinensis* (Friedrich Schmidt Petrop.) Nakai (Giant Knotweed). Waste ground, Howardian School grounds, Cardiff, with *Reynoutria japonica* and *Rubus idaeus*, ST2078, G.Hutchinson, 1988
- \*!351/1. *Gaultheria shallon* Pursh (Shallon). In ground cleared of *Rhododendron ponticum*, Gnoil House, Neath, ST7697, J.C.Watkins, 1988. First record.
- +367/3. *Primula x tommasinii* Gren. & Godron (*P. verisx P. vulgaris*) (False Oxlip). Disused railway near Llancadle, ST06, J.P.Curtis, 1988.
- +!378/2. *Ligustrum ovalifolium* Hassk. (Garden Privet). Scrub, Aberthaw, ST06, J.P.Curtis, 1988.
- +382/1. *Centaureium pulchellum* (Swartz) Druce (Lesser Centaury). Near shingle beach, Gileston, ST06, J.P.Curtis, 1988.
- +!418/1. *Antirrhinum majus* L. (Snapdragon). Waste ground, Porthkerry, ST06, J.P.Curtis, 1988.
- \*!425/cupx1x2. *Mimulus (cupreus x M. luteus) x M. guttatus* (a hybrid monkey-flower) Many plants in River Rhymney in both v.c. 35 & v.c. 41, SO10, T.G.& U.T.Evans, 1988, det. A.J.Silverside. First record.
- 435/15. *Euphrasia confusa x E. tetraquetra*. Dunes, Merthyr Mawr, SS87, T.G.Evans, 1985, det. A.J.Silverside.
- \*!450/1. *Satureja montana* L. (Mountain Savory). One small plant on Roman ruins, Barry, ST06, J.P.Curtis, 1988. First Welsh record.
- \*!501/hir. *Rudbeckia hirta* L. (Black-eyed-Susan). Coal dump, Cardiff Docks, ST1974, G.Hutchinson, 1988. First record.
- +514/5. *Filago minima* (Sm.) Pers. (Dwarf Cudweed). Fly Ash, Aberthaw, ST06, J.P.Curtis, 1988.
- +!519/6. *Aster novi-belgii* L. (Michaelmas Daisy). Waste ground, Llanbethery, ST06, J.P.Curtis, 1988.
- +526/2. *Anthemis cotula* (Stinking Mayweed). Reclaimed land, Mountain Ash, ST09, BSBI Meeting, 1987.
- +558/1/240a. *Hieracium umbellatum* L. subsp. *umbellatum* (a hawkweed). Stony bank, Llanishen reservoir, Cardiff, ST1881, G.Hutchinson, 1988.
- 574/1. *Triglochin palustris* L. (Marsh Arrowgrass). Marsh, River Thaw valley, Llanbethery, ST06, J.P.Curtis, 1988.
- 577/19. *Potamogeton crispus* L. (Curled Pondweed). River Thaw, Llanbethery, ST06, J.P.Curtis, 1988.

Glamorgan / Brecon

- +!600/2. *Hyacinthoides hispanica* (Miller) Rothm. (Spanish Bluebell). Cemetery, Porth, ST09, J.P.Curtis, 1988.
- +606/9. *Luzula multiflora* (Retz.) Lej. (Heath Wood-rush). Meadow, Llanmihangel near Cowbridge, SS9871, G.Ellis & G.Hutchinson, 1988.
- +615/1. *Sisymbrium montanum* E.L.Greene (Blue-eyed-grass). Field near Forest Lock, Whitchurch, Cardiff, ST18, M.Wiley, 1988.
- +640/1. *Ophrys apifera* Hudson (Bee Orchid). Base of embankment, Whitchurch, Cardiff, ST18, M.Wiley, 1988.
- +656/5. *Eleocharis palustris* subsp. *vulgaris* Walters (Common Spike-rush). Marsh near River Thaw, Llanbethery, ST06, J.P.Curtis, 1988.
- +663/12. *Carex sylvatica* Hudson (Wood-sedge). Old meadow with *Wahlenbergia hederacea* on SW bank of Nant Clydach, Ynysybwl, ST0596, J.Davies, 1988.
- +663/24. *Carex pallescens* L. (Pale Sedge). Old meadow with *Wahlenbergia hederacea* on SW bank of Nant Clydach, Ynysybwl, ST0596, J.Davies, 1988.
- +663/60. *Carex disticha* Hudson (Brown Sedge). Drainage zone below hockey field, Pendarren, Merthyr Tydfil, SO0507, J.Davies, 1988.
- +691/1. *Trisetum flavescens* (L.) Beauv. (Yellow Oat-grass). Roadside, Williamstown, ST09, J.P.Curtis, 1988.
- 701/2. *Agrostis canina* L. (Brown Bent). Roadside, Eglwys Brewis, ST06, J.P.Curtis, 1988.

BRECON, v.c. 42 (comm. M.Porter)

- \*!234Hol/dis. *Holodiscus discolor* (Pursh.) Maxim (Ocean-spray). Small cliffs along River Wye, Llangoed, SO1240, M.Porter, 1978, det. C.Whiteford. First record.
- \*!557/3. *Cicerbita macrophylla* subsp. *uralensis* (Rouy) P.D.Sell (Common Blue-sow-thistle). Roadside verge, Cwm Clydach, SO2012, M.Porter, 1988. First record.
- \*!571/1. *Lagarosiphon major* (Ridl.) Moss (Curly Waterweed). New pond, Glyntawe, SN8516, M.Porter, 1981, det. D.Simpson. First record.
- \*683/15. *Bromus commutatus* Schrad. (Meadow Brome). Roadside verge, Talgarth, SO1635, M.Porter, 1981, det. T.A.Cope. First localised record.
- \*!Sec/cer. *Secale cereale* L. (Rye). Garden weed, Llangynidr, SO1519, M.Porter, 1980, det. T.A.Cope. First record.
- \*!701/cas. *Agrostis castellana* Boiss. & Reuter (Castillian Bent). Garden weed, Llangynidr, SO1519, M.Porter, 1981, det. T.A.Cope. First Welsh record.

Radnor

RADNOR, v.c. 43 (comm. Miss A.C.Powell & D.R.Humphreys)

+1/5. *Diphasiastrum alpinum* J.Holub (Alpine-clubmoss). Large colony in acidic grassland NW of Glanhirin, Elan Valley, SN8470, D.R. & H. Drewett, 1988. Seen recently from only two other localities, both in the Elan Valley.

9/1. *Cryptogramma crispa* (L.) Hooker (Parsley Fern). +A single plant growing on top of a heap of shale quarry waste on N side of stream in valley S of Glogfawr near Carreg ddu Reservoir, SN9166, C.Parry & D.Gray, 1988; +also one plant on rock outcrop at Gilfach, Rhayader, SN9571, I.D.Soane & D.Hargreaves, 1988. First positive records since an unconfirmed one of 1953 from Stanner Rocks.

+21/3. *Dryopteris oreades* Fomin (Mountain Male-fern). A few plants on cliff to W of Tyfaenor Park, Abbeycwmhir, SO0671, R.G.Woods & D.Hargreaves, 1988. Now lost due to track widening, but one plant taken into cultivation.

24/3. *Phegopteris connectilis* (Michx) Watt (Beech Fern). Damp dingle woodland below Fron Rocks, Beguildy, SO1976, NCC Woodland Survey, 1988. A rare fern with few records from E Radnor.

+24/4. *Gymnocarpium dryopteris* (L.) Newman (Oak Fern). On N facing rock outcrop, N of Llanbadarn Fynydd, SO08, J.Port, 1988.

25/1vul. *Polypodium vulgare* L. s.s. (Polypody). S wall of small park area near museum, Llandrindod Wells, SO0661, G.Hutchinson, 1988.

+25/1int. *Polypodium interjectum* Shivas (Intermediate Polypody). S wall of small park area near museum, Llandrindod Wells, SO0661, G.Hutchinson, 1988.

28/1. *Botrychium lunaria* (L.) Swartz (Moonwort). +Meadow, Troedrhiwdraen, Elan Valley, SN8967; +also meadow at Llanbister, SO1073, NCC Meadow Survey, 1988. Now known from 8 sites in the County.

+29/1a. *Ophioglossum vulgatum* L. (Adder's-tongue). Meadow, Pantydwr, SN9777, NCC Meadow Survey, 1988. Now known from 9 sites in the County.

37/1. *Trollius europaeus* L. (Globeflower). A small colony on a wooded stream bank near the River Ithon, Llanbister, SO1075, NCC Meadow Survey, 1988; +four plants by stream margin, Llanbadarn Fynydd, SO08, J.Port, 1988.

\*!39/1. *Eranthis hyemalis* (L.) Salisb. (Winter Aconite). A fine naturalized population on a wooded bank on the edge of Wyecliff garden, Clyro, SO2242, R.G.Woods, 1988. This population has obviously been in existence for many years but remained unrecorded until noted by Mrs M.Westwood.

+!106/1. *Cheiranthus cheiri* L. (Wallflower). Naturalized population on cliff ledge in old limestone quarry, Burlingjobb, SO2458, R.G.Woods, 1988.

+162/2. *Tilia cordata* Miller (Small-leaved Lime). Rare in woodland, Bryn Person, Llananno, SO0872, NCC Woodland Survey, 1988.

Radnor

+168/9. *Geranium pyrenaicum* Burm. fil. (Hedgerow Crane's-bill). In rough grassland on site of former railway station, Llanelwedd, SO0451, BSBI Meeting, 1988. This rare denizen has not been recently recorded elsewhere in the County.

+168/10. *Geranium columbinum* L. (Long-stalked Crane's-bill). On waste ground behind the foundry, Presteigne, SO3164, R.G.Woods, 1988.

+!171/4. *Impatiens glandulifera* Royle (Indian Balsam). By forestry track near Cold Oak, Presteigne; and by the River Lugg below Presteigne, both SO2863, R.G.Woods, 1988. This widespread alien of river banks appears to be a recent colonist of the River Lugg.

!191/3. *Melilotus alba* Medic. (White Melilot). By roadside fence, Llanelwedd, SO05, BSBI Field Meeting, 1988. Not then in flower but confirmed later by R.G.Woods.

192/24. *Trifolium micranthum* Viv. (Slender Trefoil). Abundant on roadside verge of the A481 near Llanelwedd Quarries, SO0551, BSBI Field meeting, 1988. First recent record.

+202/1. *Ornithopus perpusillus* L. (Bird's-foot). Forestry Track, Caen Wood, Presteigne, SO2962, R.G.Woods, 1988.

206/2. *Vicia tetrasperma* (L.) Schreb. (Smooth Tare). On soil of layby, roadside, S of Penylan Wood, Clyro, SO24, R.G.Woods, 1988.

+223/1. *Sanguisorba minor* Scop. subsp. *minor*. (Salad Burnet). A few plants on side of rarely used forestry track, Caen Wood, Presteigne, SO3063, R.G.Woods, 1988. A calcicole, it may have been introduced with road stone. This may be the only extant site in Radnor.

+\$251/2. *Daphne laureola* L. (Spurge Laurel). A single plant in a roadside hedge near Penmaenau, Llanelwedd, SO0352, P.& C.Port & R.G.Woods, 1988; +and in an overgrown shrubbery at Womaston near Walton, SO2660, D.Humphreys & R.G.Woods, 1988. This species is doubtfully native in the County.

§263/1. *Viscum album* L. (Mistletoe). Possibly planted on apple in garden, Howey, SO0558, C.Parry, 1988. A very rare plant north of Aberedw.

+301/1. *Aethusa cynapium* L. (Fool's Parsley). Silt by River Teme, E of Presteigne, SO3264, R.G.Woods, 1988.

\*!336/2. *Alnus incana* (L.) Moench (Grey Alder). Becoming naturalized beside forestry tracks in Radnor Forest, SO1966, R.G.Woods, 1988. First record.

+382/4. *Centaurium erythraea* Rafn. (Common Centaury). On and besides forestry tracks in Caen Wood, Presteigne, SO2962 & SO3063, R.G.Woods, 1988.

+!399/2. *Pulmonaria officinalis* L. (Lungwort). One plant naturalized on old wall near church, Presteigne, SO3164, R.G.Woods, 1988.

+!406/3. *Calystegia silvatica* (Kit.) Griseb.) (Large Bindweed). Waste ground, Presteigne, SO3164, R.G.Woods, 1988.

Radnor

+420/3. *Linaria repens* (L.) Miller (Pale Toadflax). On gravel on railway embankment S of Llangunllo Station, SO2172, R.G.Woods, 1988.

421/1. *Chaenorhinum minus* (L.) Lange (Small Toadflax). On waste ground behind foundry, Presteigne, SO3164, R.G.Woods, 1988.

\*\$422/1. *Kickxia spuria* (L.) Dumort. (Round-leaved Fluellen). A small clump growing on disturbed soil in a layby, adjacent to forestry, S of Penylan Wood, NW of Clyro, SO2044, R.G.Woods, 1988. First record of this normally SE cornfield weed.

\*426/1. *Limosella aquatica* L. (Mudwort). A few plants in a very small ephemeral pool in grass track by tarred road on common N of Pen-y-graig Farm, Llandeilo Graban, SO1045, R.G.Woods, 1988. First record.

+430/4. *Veronica scutellata* L. (Marsh Speedwell). Marshy ground, Litton Hill, Cascob, SO2566, J.& C.Port, 1988

+\$445/5x7. *Mentha x villosa* (*M. spicata* x *M. suaveolens*) (Apple Mint). Bank of River Lugg below Presteigne, SO3264, R.G.Woods, 1988. Another vigorous escapee from the garden.

+1461/arg. *Lamiastrum argentatum* Smejkal (Variegated Yellow Archangel). Road verge of lane NE of Llynheilyn, SO1658, R.G.Woods, 1988. Second record. A vigorous, even overwhelming garden plant likely to become widely naturalized.

+485/10. *Galium uliginosum* L. (Fen Bedstraw). Wet grassland near Esgairdraenllwyn, Llanbadarn Fynydd, SO0882, NCC Meadow Survey, 1988.

+497/2. *Dipsacus pilosus* L. (Small Teasel). In woodland on the bank of the River Wye near Cabalva, SO2446, J.E.Messenger & D.Hargreaves, 1988. Third record.

+\$475/2. *Campanula trachelium* L. (Nettle-leaved Bellflower). A single plant in the middle of a forestry road, Ysfa, SN9964, F.Lancaster, 1988. Only previously seen in SE Radnor, this plant was probably introduced with roadstone.

+1544/2. *Centaurea montana* L. (Perennial Cornflower). Naturalized on railway embankment S of Llangunllo Station, SO2172, R.G.Woods, 1988.

+559/8. *Crepis paludosa* (L.) Moench (Marsh Hawk's-beard). In wt alder wood near Llangunllo Station, SO2172, D.R.Drewett. Third record.

+577/14. *Potamogeton obtusifolius* Mert. & Koch (Blunt-leaved Pondweed). In pool with *Potamogeton berchtoldii*, *Pilularia globulifera* etc., NW of Gogia, The Begwns, Llowes, SO1643, R.G.Woods & J.E.Messenger, 1988.

+\$589/3. *Polygonatum multiflorum* (L.) All. (Solomon's-seal). Two separate plants on steep bank of River Wye, Glangwy Farm, Builth Road, SO0153, A.C.Powell, J.& C.Port, 1988. Probable garden escapes.

\*631/1. *Hammarbya paludosa* (L.) O. Kuntze (Bog Orchid). Fifteen plants on edge of wet peaty flush to N of Pont ar Elan, Elan Valley, SN9071, R.G.Woods, 1988. First record.

Radnor / Carmarthen

- 652/2. *Sparganium emersum* Rehm. (Unbranched Bur-reed). +Pool NW of Glanhirin, Elan Valley, SN8470; also in mud-bottomed pool W of Pen-y-craig, Llandeilo Graban, SO14, both R.G.Woods; +also in dammed up stream pool, Cwm Nanty, Llanbadarn Fynydd, SO0980, J.Port, 1988.
- +655/10. *Scirpus setacea* L. (Bristle Club-rush). Marshy area, Litton Hill, Cascob, SO2562, C. & J.Port, 1988.
- +656/4. *Eleocharis multicaulis* (Sm.) Desv. (Many-stalked Spike-rush). +Wet peaty flush above road and S of ravine on E side of Garreg Ddu Reservoir, Elan Valley, SN9165; also peaty lush N of Pont ar Elan, Elan Valley, SN9071, both R.G.Woods, 1988. Reported here or nearby by W.E.W. in 1959 (*Proc. BSBI* 5: 38).
- 663/1. *Carex laevigata* Sm. (Smooth-stalked Sedge). +Damp scrubland, Glangwy Farm, Builth Road, SO0153, J. & C.Port & A.C.Powell; +damp woodland below Fron Rocks, Beguildy, SO1976, NCC Woodland Survey; +also wet flushes, Caen Wood, Presteigne, SO3063, R.G.Woods, all 1988.
- +663/12. *Carex sylvatica* Hudson (Wood-sedge). Waste ground, Presteigne, SO3164, R.G.Woods, 1988.
- 663/17. *Carex vesicaria* L. (Bladder-sedge). Marsh on River Wye flood plain, NW of Builth Wells river bridge, SO0451, BSBI meeting, 1988, det. R.G.Woods; +also rare in wet hollows, downstream from Esgairdraenllwyn, Llanbadarn Fynydd, SO0881 & SO0882, NCC Meadow Survey, 1988.
- 663/23. *Carex strigosa* Hudson (Thin-spiked Wood-sedge). On damp woodland bank, Cilkenny Dingle Wood, Llowes, SO1741, D.R.Drewett, 1988. Second record.
- +663/24. *Carex pallescens* L. (Pale Sedge). Margin of wet flush in pasture near Llangunllo Station, SO2172, NCC Meadow Survey, 1988.
- +670/2. *Festuca arundinacea* Schreb. (Tall Fescue). beside forest tracks, Caen Wood, Presteigne, SO3063, R.G.Woods, 1988.
- \*683/1. *Bromus erectus* Hudson (Upright Brome). Rare in grassland below Stanner Rocks, SO2658, R.G.Woods, 1988. First record.
- +701/4. *Agrostis gigantea* Roth (Black Bent). Waste ground behind foundry, Presteigne, SO3164, R.G.Woods, 1988. Second record.
- +709/1. *Milium effusum* L. (Wood Millet). Stocking Farm Wood near Presteigne, SO3166, NCC Woodland Survey, 1988.

CARMARTHEN, v.c. 44 (comm. R.D.Pryce)

+4/1. *Equisetum hyemale* L. (Rough Horsetail). Solid colony c.12m along roadside verge, Cathilas Farm, Ammanford, SN6414, I.K.Morgan, 1988. Third record.

21/2aff. *Dryopteris affinis* (Lowe) Fraser-Jenkins subsp. *affinis* (Scaly Male-fern). +Roadside hedgebank, 0.8km SE of Pontwelly, SN4239; +base of steep wood alongside River Teifi, SE side of unmetalled road, Dol-llan, E of Llandyssul, SN4240; +edge of wood near Sychnant Farm, 1.4km E of Llanedi, SN6007, all G.Hutchinson, 1988.

Carmarthen

\*21/2aff. *Dryopteris affinis* subsp. *affinis* var. *palaeo-lobata* ined. (Scaly Male-fern). Carboniferous limestone gryke, top of Carreg-yr-Ogof, SN7621, R.D.Pryce et al., 1988, det. C.R.Fraser-Jenkins. First record of variety.

21/2bor. *Dryopteris affinis* subsp. *borreri* (Newman) Fraser-Jenkins (Scaly Male-fern). +Roadside hedgebank of Roman road, Pensarn near Carmarthen; +minor roadside hedgebank near Rhydargaeau, SN4325; +wood on steep slope SE of Blaenyfre Farm, Dol-gran, SN4333; +under *Corylus avellana* along roadside N of Cynghordy Viaduct, SN8042, all G.Hutchinson, 1988.

\*21/2x1. *Dryopteris* x Fraser-Jenkins nothosubsp. *complexa* (*D. affinis* subsp. *affinis* x *D. filix-mas* (a hybrid male-fern). Driveway bank at entrance to Dol-llan, 0.8km NE of Pontwelly, SN4240, G.Hutchinson, 1988, det. C.R.Fraser-Jenkins. First record.

+46/7. *Ranunculus sardous* Crantz (Hairy Buttercup). 20-30 mature plants in disturbed damp grassy ground, Burry Port Harbour, SN4400, R.Higgins & D.Lawrence, 1988.

113/11. *Viola lutea* Hudson (Mountain Pansy). About 20 mature plants, mostly purple flowered but 2 yellow flowers noted, base-enriched, dry, sheep-grazed moorland, NW facing flank of Esgair Gaeo, A.O.Chater et al., 1988.

+192/5. *Trifolium squamosum* L. (Sea Clover). In grassy sward on fuel ash, Burry Port Power Station, SN4500 & 4600, R.Higgins & D.Lawrence, 1988.

\*!209/2. *Spiraea douglasii* Hooker subsp. *douglasii* (Steeplebush). Railway cutting, Burry Port, SN4400, G.Hutchinson, 1988. First record.

+210/1. *Filipendula vulgaris* Moench (Dropwort). Grassy graveyard, Llanfihangel ar Arth, SN4539, G.Hutchinson, 1988.

+211/11.113. *Rubus polyanthemus* Lindeb. (a bramble). Wooded pond-side, Farmyard Nursery Farm, Llandyssul, SN4240, G.Hutchinson & R.D.Pryce, 1988, det. A.Newton.

+211/11.117. *Rubus prolongatus* Boulay & Letendre (a bramble). Abandoned railway cutting N of Llanpumsaint, SN4130, G.Hutchinson & R.D.Pryce; +also roadside hedge, S of Llwyn y Fron, SN7523, R.D.Pryce, both 1988, det. A.Newton.

+!320/20. *Reynoutria sachalinensis* (Friedrich Schmidt Petrop.) Nakai (Giant Knotweed). Along roadside and invading garden of newly built bungalow near Bolahaul, Carmarthen, SN4118, G.Hutchinson, 1988.

+325/11uli. *Rumex crispus* L. var. *uliginosus* Le Gall (Curled Dock). Tidal mud, River Towy near station, Carmarthen, SN4119, G.Hutchinson, 1988. First record of variety.

\*!341Not/pro. *Nothofagus procera* (Poepp. & Endl.) Orsted. (Rauli Beech). Edge of wood adjoining railway, SW of Cynghordy Viaduct, SN8041, G.Hutchinson, 1988. First record, probably planted.

Carmarthen

+343/13x12b. *Salix x multinervis* Doell (*S. aurita* x *S. cinerea*) (a hybrid willow). Hedge near top of hill near Dol-llan, Llandyssul, SN4241, G.Hutchinson & R.D.Pryce, 1988.

+422/2. *Kickxia elatine* (L.) Dumort. (Sharp-leaved Fluellen). In strawberry patch in garden, Pwll, Llanelli, SN4701, R.D.Pryce, 1988.

\*442/1. *Utricularia vulgaris* L. (Greater Bladderwort). Drainage ditch on sand dunes, Pendine Proof and Experimental Establishment, SN3007, R.G.Ellis, 1988. First record.

\*1461/arg. *Lamiastrum argentatum* Smejkal (Variegated Yellow Archangel). Floor of shaded footpath, E of N end of Three Fields footpath near Cwmoernant, Carmarthen, SN4121, G.Hutchinson; +also limestone grassland, Capel Dyddgen, SN4612, I.K.Morgan, both 1988. First and second records.

+1475/5. *Campanula persicifolia* L. (Peach-leaved Bellflower). About six plants on roadside bank adjacent to and across road from graveyard, Capel Gwyn, SN4622, R.D.Pryce, 1988. Third record.

507/1. *Doronicum pardalianches* L. (Leopard's-bane). Deciduous wood, Bolahaul, Carmarthen, SN4118, G.Hutchinson, 1988.

!509/2. *Petasites albus* (L.) Gaertn. (White Butterbur). Lane bank opposite farm entrance, Dryslwyn Uchaf, SN5520, D.Smith, 1988, det. R.D.Pryce. Second record.

\*!601/arm. *Muscari armeniacum* Leichtlin ex Baker (a hyacinth). One clump on grass verge, Llangunnor, SN4219, G.Hutchinson, 1988. First record.

663/3. *Carex punctata* Gaudin (Dotted Sedge). Little used trackway, formerly mowed 'dune meadow', Tywyn Burrows, SN3605, R.D.Pryce *et al.*, 1988, det. A.O.Chater.

+663/22. *Carex pendula* Hudson (Pendulous Sedge). Edge of wood on alluvial plain of E. Cleddau River, Gilfach-ddofn, SN1227, G.Hutchinson & R.D.Pryce, 1988, det. A.O.Chater.

663/60. *Carex disticha* Hudson (Brown Sedge). Ditch by old railway sidings 0.5km E of Burry Port Power Station, SN4500, R.Higgins & D.Lawrence, 1988.

+670/1x671/1. *xFestulolium loliaceum* (Hudson) P.Fourn (*Festuca pratensis* x *Lolium perenne*) (Hybrid Fescue). Species-rich meadow, Ty Mawr, Talsarn, Llanddeusant, SN7826, S.M.G., 1988. Fourth record.

+676/9. *Poa compressa* L. (Flattened Meadow-grass). Railway ballast with *Vulpia myuros*, *Vicia hirsuta*, etc., c.100m E of Penclawdd, Llwynhendy, SS5498, R.D.Pryce, I.K.Morgan & R.N.Stringer, 1988. Third record.

\*!687/jub. *Hordeum jubatum* L. (Foxtail Barley). Frequent (over 300 plants) on drier areas by Ash-pits lagoons, Pwll, Llanelli, SN4701, R.Higgins & D.Lawrence, 1988.

+1690/1. *Gaudinia fragilis* (L.) Beauv. (French Oat). 'Flowery' meadow with *Carum verticillatum*, *Cirsium dissectum*, *Sanguisorba officinalis*, etc., Cefn Goleu, Garnant, SN6913, S.Gooch, 1988, det. J.M.Mullin. Quite extensive in a 'native' site, second record.

PEMBROKE, v.c. 45 (comm. S.B.Evans)

7/2. *Hymenophyllum wilsonii* Hooker (Wilson's Filmy-fern). Dip zone below NE face of tor, Carn Ffoi, Carningli, SN0437, SB.Evans, 1988.

+9/1. *Cryptogramma crispa* (L.) Hooker (Parsley Fern). One small clump in stable block-field, Carnmeini, SN1432, C.Batt, 1988.

24/3. *Phegopteris connectilis* (Michx) Watt (Beech Fern). Amongst rocks, S of Carnbica on slopes of Craig Talfynydd, SN1331, S.Devonald, 1987.

26/1. *Pilularia globulifera* L. (Pillwort). Margin of shallow pond, Ramsey West central pond, SM7023, S.B.Evans, 1987 (first island record); water-filled clay ditch, SE corner, Tretio Common, SM7928, S.B.Evans, 1987; +also poached clay margin of re-excavated old pond, Lochmeyler Farm near Brawddy, SM8527, S.B.Evans & G.Liles, 1988; cattle poached clay in shallow ditch, Ysgeifiog Moor, SM8027, S.B.Evans, 1988.

+50/3. *Thalictrum minus* L. subsp. *minor* (Lesser Meadow-rue). Limestone pavement at top of sea cliff, Saddle Head, Castlemartin, SR9692, J.W.Donovan, A.Pearce & S.Devonald, 1988.

115/13. *Hypericum montanum* L. (Pale St John's-wort). Three plants below calcareous scrub in *Festuca* zone on low sheltered limestone sea cliff, Bush Estate, Pembroke River, SM9701, S.B.Evans, 1987.

+113/5. *Viola reichenbachiana* Jordan ex Boreau (Early Dog-violet). Hedgerow, Uzmaston, Haverfordwest, SM9714, M.Higgins, 1987.

\*220/3. *Alchemilla filicaulis* subsp. *vestita* (Buser) M.E.Bradshaw (Hairy Lady's-mantle). Flushed grassland on gentle slope dominated by *Succisa pratensis* and *Agrostis canina*, Cwm Rhigian, 2.5km W of Newport, SN0339, E.Gwynn & S.B.Evans.

440/3. *Orobanche rapum-genistae* Thuill. (Greater Broomrape). Over 200 plants, some very large, in mature *Ulex europaeus* scrub and bracken on steep slope, Ysgubor Wen, St Dogmael's, SN1546, C.H.Thomas, 1988.

+625/2. *Epipactis helleborine* (L.) Crantz (Broad-leaved Helleborine). Secondary Woodland, Cwm Blaen-bwlan, Boncath, SN2337, C.Thomas, 1987.

+663/33. *Carex lasiocarpa* Ehrh. (Slender Sedge). *Molinia* dominated centre of calcareous mire, Cors Penally, S of Penally railway station, SS1198, F.Rose, 1987. Second record; the record for SM80 in *Flowering Plants of Wales* is incorrect. The only previous record is from SR89.

Cardigan

CARDIGAN, v.c. 46 (comm. A.O.Chater)

2/1. *Selaginella selaginoides* L. (Lesser Clubmoss). Flush by Camddwr, Soar y Mynydd, SN7853, A.O.Chater & D.Davies, 1988. Second record.

+4/7. *Equisetum sylvaticum* L. (Wood Horsetail). Flush by Afon Doethie below Pen y Gurnos, SN75, A.O.Chater & A.P.Fowles, 1988.

16/1. *Asplenium ceterach* L. (Rustyback). Rock face of Ponterwyd Quarry, 1km W of village, SN78, A.O.Chater & A.P.Fowles, 1988. Apparently the only record from rock, as opposed to mortared walls, in Cards.

19/1. *Cystopteris fragilis* (L.) Bernh. (Brittle Bladder-fern). Ruined walls of Esgairlle lead mine, Cwmergyr, SN78, A.O.Chater, 1988.

+21/3. *Dryopteris oreades* Fomin (Mountain Male-fern). Damp, S facing cliff, Craig y Pistyll, SN78, A.O.Chater et al., 1988, det. C.R.Fraser-Jenkins.

+22/2. *Polystichum aculeatum* (L.) Roth (Hard Shield-fern). Dingle below main road 500m NE of Llanarth, SN45, A.O.Chater, 1988.

28/1. *Botrychium lunaria* (L.) Swartz (Moonwort). Unimproved pasture, Gilfachgwyddil, Llangeitho, SN66, A.O.Chater & D.Glyn Jones, 1988.

+29/1. *Ophioglossum vulgatum* L. (Adder's-tongue). 45 fronds in stony turf, Eaglebrook lead mine, NW corner of Nant y Moch reservoir, SN78, A.O.Chater, 1988. Apart from one old record from Devil's Bridge, not otherwise recorded from the uplands in Cards.

+67/4. *Brassica nigra* (L.) Koch (Black Mustard). Crevices of ruined promenade, Cei Bach, SN45, A.O.Chater, 1988.

\*!71/1. *Hirschfeldia incana* (L.) Lagreze-Fossat (Hoary Mustard). Railway embankment opposite Eglwys-fach, SN6796, W.M.& P.Condry, 1988, det. A.O.Chater. First record, but known here in abundance for at least 20 years.

+77/1. *Cakile maritima* Scop. (Sea Rocket). One plant on sandy shingle, Cei Bach, SN45, A.O.Chater, 1988.

113/7. *Viola lactea* Sm. (Pale Dog-violet). Rank, horse-grazed *Molinia* pasture E of Aber-arth, SN4963, A.O.Chater & A.P.Fowles, 1988. Recorded apparently from two other sites in the general area by Salter in 1932-1939, but not seen in Cards. since; in the present site, which has since been destroyed, it occurred in several large colonies over about an acre.

+156/5. *Atriplex laciniata* L. (Frosted Orache). One plant on sandy shingle, Cei Bach, SN45, A.O.Chater, 1988.

+159/1. *Salsola kali* L. subsp. *kali* (Prickly Saltwort). Two plants on sandy shingle, Cei Bach, SN45, A.O.Chater, 1988.

+192/4. *Trifolium medium* L. (Zigzag Clover). Abundant on roadside bank 200m E of Llain-gors, Gors-goeh, SN45, BSBI Field Meeting, 1988.

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206/9. *Vicia orobus* DC. (Wood Bitter-vetch). Frequent in unimproved pasture, Gilfachgwyddil, Llangeitho, SN66, D.Glyn Jones, 1988.

+220/3/10. *Alchemilla glabra* Neygenf. (Smooth Lady's-mantle). Damp, N facing cliffs S of Cyneiniog, 7km E of Tal-y-bont, SN78, N.Penford et al., 1988.

\*229/1. *Crataegus laevigata* (Poiret) DC. (Midland Hawthorn). One bush in ancient Sessile Oak woodland, Allt Pantybeudy, Llangeitho, SN6361, G.Saunders, 1988. Presumably native, though only 3km from planted hedge of this species 1km E of Blaenpennal church, SN66, A.O.Chater, 1982; \$planted hedge in Capel Bangor village by churchyard, SN68, A.O.Chater, 1982.

+232/7. *Sorbus torminalis* (L.) Crantz (Wild Service-tree). Sessile oak wood, Allt Castell-geifr, Llanarth, SN45; Allt yr Haern, Mydyr valley, SN45, both G.Saunders, 1988.

\*!240Tolmen. *Tolmiea menziesii* (Pursh) Torrey & A.Gray (Pick-a-back-plant). Streambank in mixed woodland 400m NNE of Felin Rhiwbren, Mydyr valley, SN4757, A.O.Chater, 1988. First record. Well-naturalised in two places.

+!256/cam. *Oenothera cambrica* Rost. (Small-flowered Evening-primrose). Waste ground by new houses, Ponterwyd, SN78, A.O.Chater, 1988.

+262/4. *Callitriche hamulata* Koch (Intermediate Water-starwort). Abundant in E-most lake, Llynnoedd Ieuan, SN88, A.O.Chater, 1988.

+!265/2. *Cornus sericea* L. (Red-osier Dogwood). Several bushes in roadside hedge 1km WNW of Troed-y-rhiw, SN45, A.O.Chater, 1988. 250m from nearest garden, and obviously long-established.

\*325/1luli. *Rumex crispus* L. var. *uliginosus* Le Gall (a curled dock). Frequent on regularly inundated terrace on W side of Afon Leri, E of Borth church, SN68 & 69, J.R.Akeroyd & A.O.Chater, 1988.

\*!320/pen. *Polygonum pensylvanicum* L. (Pinkweed). Mixed barley and potato field, Ty-gwyn, Mwnt, SN1952, A.O.Chater, 1988, conf. J.R.Akeroyd & D.H.Kent. One plant seen (no further search made) in field long known for its abundance of arable weed species. First record.

+382/4. *Centaureum erythraea* Rafn (Common Centaury). Unimproved pasture, Gilfachgwyddil, Llangeitho, SN66, N.R.Thomas, 1988.

!425/3. *Mimulus moschatus* Douglas ex Lindley (Musk). By stream at bottom end of Silian Common, SN55, I.K.Morgan et al., 1988. First seen here by Salter in 1939.

+435/1/2. *Euphrasia scottica* Wettst. (an eyebright). Flushes with *Carex hostiana* and *Linum catharticum*, Rhydtalog, NW corner of Llyn Brianne, SN75, A.O.Chater, 1988, det. P.F.Yeo. The characteristic *Euphrasia* of acidic or somewhat mineral-rich flushes in the Cards. uplands.

435/1/15. *Euphrasia confusa* Pugsley (an eyebright). Spoil heaps and acidic turf, Eaglebrook lead mine, NW corner of Nant y Moch reservoir,

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SN78, A.O.Chater, 1988, det. P.F.Yeo. The commonest *Euphrasia* on lead mine sites in N. Cards.

435/1/16. *Euphrasia pseudokernerii* Pugsley f. *elongata* Pugsley (an eyebright). Calcareous flushes by Afon Mwldan NW of Penparc, SN2048, A.O.Chater, 1986, det. P.F.Yeo. The species previously known in Wales from only one record from Flints.; f. *elongata* is a fen form known from East Anglia.

+435/1/17. *Euphrasia arctica* Lange ex Rostrup subsp. *borealis* (Townsend) Yeo (an eyebright). Hay meadows, Nant Llwyd, NW of Llyn Brianne, SN75, A.O.Chater, 1988, det P.F.Yeo. In several upland hay meadows in this part of Cards.

+442/4. *Utricularia minor* L. (Lesser Bladderwort). Mire at head of Pysgotwr Fach, Llethr Erwast, SN75, D.Boyce et al., 1988.

+462/1. *Lamium amplexicaule* L. (Henbit Dead-nettle). Margin of beanfield just SW of Pen-Peles, SN25, A.P.Fowles, 1988, det. A.O.Chater.

462/5. *Lamium album* L. (White Dead-nettle). Roadside hedgebank, Bronfre, 1.5km W of Ciliau Aeron, SN45, M.Chater, 1988.

+472/2. *Plantago media* L. (Hoary Plantain). Abundant in chapel graveyard, Ciliau Aeron, SN4958, A.O.Chater, 1988. As *Trisetum flavescens* is also present, there is no reason to assume that it is not native and another example of the occurrence of calcicoles in graveyards; it has not been seen in Cards. for over 40 years.

+474/1. *Wahlenbergia hederacea* (L.) Reichenb. (Ivy-leaved Bellflower). Stream bank, Silian Common, SN55, A.O.Chater et al., 1988.

+506/18x1. *Senecio* x *albescens* Burbidge & Colgan (*S. bicolor* subsp. *cineraria* x *S. jacobaea*) (a hybrid ragwort). Sandy shingle by road 1km N of Borth Station, SN69, A.O.Chater & J.R.Akeroyd, 1988.

+512/1. *Inula helenium* L. (Elecampane). Well-established on roadside verge, Llanybi Common, SN55, A.O.Chater, 1984.

+532/1. *Matricaria recutita* L. (Scented Mayweed). Several plants on waste ground by new houses, Ponterwyd, SN78, A.O.Chater, 1988.

+535/1. *Artemisia vulgaris* L. (Mugwort). Verge of A44 700m NE of Dyffryn Castell, SN78, A.O.Chater, 1988.

+539/4. *Carduus acanthoides* L. (Wetted Thistle). 20 plants at edge of recently improved pasture 1.5km S of Llwyncelyn, SN45, A.O.Chater, 1988.

+540/8. *Cirsium dissectum* (L.) Hill (Meadow Thistle). Colony 20m in diameter in marshy pasture W of Glanyrafon-du, Cwm Berwyn, SN75, A.O.Chater, 1988.

+551/1. *Picris echioides* L. (Bristly Oxtongue). Disused railway line, Felin-y-mor, Aberystwyth, SN58, M.Chater, 1988.

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\*1558/2/7. *Pilosella aurantiaca* (L.) F.W.Schultz & Schultz Bip. subsp. *aurantiaca* (Fox-and-cubs). Well-naturalised, with subsp. *carpathicola*, in Ponterwyd chapel graveyard, SN78, A.O.Chater & BSBI Field Meeting, 1987, det. P.D.Sell.

+559/8. *Crepis paludosa* (L.) Moench (Marsh Hawk's-beard). Rocky, wooded streambank, Cwm Llyfnant, SN7397, R. Bamford, 1988. Second record. Previously known only from Cwm Einion, although J.E.Lousley reported it from Cwm Llyfnant in 1955 without indicating in which vice-county, and there is an unconfirmed J.A.Webb report from Devil's Bridge in 1933.

+1588/1. *Convallaria majalis* L. (Lily-of-the-valley). Abundantly naturalized on disused railway embankment opposite Aber-mad, SN67, A.P.Fowles, 1988.

605/fol. *Juncus foliosus* Desf. (a toad rush). +Ditches on marshy slopes by stream W of Pantycetris, Talgarreg, SN4051, A.O.Chater; flush, Rhos Llawr-cwrt N.N.R., Talgarreg, SN45, BSBI Field Meeting; marshy footpath, Cwm Doethie, SN75, A.O.Chater & A.P.Fowles; +stony flush above Ty-mawr, Cwm Ystwyth, SN87, A.O.Chater & W.M.Condry, all 1988.

+607/5. *Allium vineale* L. var. *compactum* (Thuill.) Boreau (Wild Onion). Hedgebank W of Wen chapel graveyard, Gilfachrheda, SN4159, A.O.Chater, 1988. Salter's remark that this is the only variety in Cards. is still true.

+631/1. *Hammarbya paludosa* (L.) O.Kuntze (Bog Orchid). 16 plants in flush on NNW facing slope, Dyffryn Castell, SN78, A.P.Fowles & A.O.Chater; 107 plants in flushes on N facing slope, Bryn Bras, SN78, A.O.Chater; 15 plants in flush on S facing slope, Bryn Lluestydd, SN78, A.O.Chater, all 1988. At the three previously known sites in Cards., 10 plants were seen in a flush on S facing slope, Bryn Bras, SN77, A.O.Chater, W.M. & P. Condry, 89 plants were seen in one site in Cwm Ystwyth, SN87, and none in the other, making a total of 237 plants in 5 sites in Cards. in 1988.

+635/1. *Coeloglossum viride* L. (Frog Orchid). Pingo rampart, Rhos Glynrhelyg D.W.T. Reserve, Gorsgoch, SN4951, BSBI Field Meeting, 1988. One spike only seen; last recorded in Cards. in 1926 by Salter at Llywernog, SN78.

+638/1. *Platanthera chlorantha* (Custer) Reichenb. (Greater Butterfly-orchid). Heathy pasture by Cors Nancwnlle, 1km NNW of Bwlch-llan, SN55, A.O.Chater & D.Glyn Jones, 1988.

\*642/2x6. *Dactylorhiza x townsendiana* (Rouy) Soo nothosubsp. *robertsii* F.Horsman (*D. maculata* x *D. majalis* subsp. *cambrensis* (a hybrid marsh-orchid). Wet meadowland, Ynyslas, SN69, F.Horsman, 1988. New to science.

+643/4. *Dactylorhiza praetermissa* (Druce) Soo (Southern Marsh-orchid). Poor fen, Silian Common, SN55, A.O.Chater et al., 1988.

+643/5. *Dactylorhiza purpurella* (T. & T.A.Stephenson) Soo (Northern Marsh-orchid). Marshy corner of field 500m SW of Pen-Peles, SN25, A.P.Fowles, 1988.

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+656/3. *Eleocharis quinqueflora* (F.X.Hartmann) O.Schwarz (Few-flowered Spike-rush). Fen and flushes on rhos slopes E of Aber-arth, SN46, A.O.Chater & A.P.Fowles, 1988.

+656/4. *Eleocharis multicaulis* (Sm.) Desv. (Many-stalked Spike-rush). Flushes by stream SSE of Cyneiniog, 7km E of Tal-y-bont, SN78, A.O.Chater, I.Francis & N.Penford, 1988.

+660/1. *Rhynchospora alba* (L.) Vahl (White Beak-sedge). Flushes by stream S of Cyneiniog, 7km E of Tal-y-Bont, SN78, A.O.Chater, I.Francis & N.Penford, 1988; mire SE of Disgwylfa Fawr, SN78, I.Francis & N.penford, 1988.

+663/17. *Carex vesicaria* L. (Bladder-sedge). Locally dominant in overgrown, stagnant, shaded decoy pond SE of Llanaeron mansion, SN45, A.O.Chater, 1988.

+663/28. *Carex limosa* L. (Bog-sedge). Boggy lake-margin, Llyn y Figyn, 5km SSE of Cwmystwyth, SN87, D.Reed, 1988.

+663/57. *Carex otrubae* Podp. (False Fox-sedge). Regularly inundated terrace on W side of Afon Leri, E of Borth church, SN68, A.O.Chater & J.R.Akeroyd, 1988.

+663/81. *Carex dioica* L. (Dioecious Sedge). Abundant in wet depressions in mire WSW of Bryn Bras farm, Ponterwyd, SN78, A.O.Chater, 1988.

\*1670/dif. *Festuca diffusa* Dumort. (a fescue). Abundant and well-established on grassy slope by new housing estate, Ponterwyd, SN78, A.O.Chater, 1988, det. A.K.Al-Bermani.

+683/20. *Bromus catharticus* Vahl (Rescue Brome). Roadside verge at N end of Lampeter, SN5748, A.Orange, 1981, det. P.J.O.Trist.

+691/1. *Trisetum flavescens* (L.) Beauv. (Yellow Oat-grass). Cilliau Aeron chapel graveyard, SN45, A.O.Chater, 1988.

\*701/2b. *Agrostis vinealis* Schreber (Heath Bent). *Empetrum/Calluna* heath, Llynnoedd Ieuan, SN7981; +roadside cliff N of Gorsgoch, SN4751, both A.O.Chater, 1988; +*Nardus/Festuca ovina* sheepwalks, Llethr Erwast, SN75, A.O.Chater et al., 1988. Widespread and often abundant in the uplands of Cards. First and subsequent records.

+701/4. *Agrostis gigantea* Roth (Black Bent). Dry roadside ditch, Glanynrafon-du, Cwm Berwyn, SN75, A.O.Chater, 1988, conf. E.J.Clement. Both stoloniferous and rhizomatous forms growing together.

MONTGOMERY, v.c. 47 (comm. Mrs M. Wainwright)

+3/1. *Isoetes lacustris* L. (Quillwort). Llyn Gwyddior, SH9307, A.J.Morton, 1987, (megaspores checked).

\*3/2. *Isoetes echinospora* Durieu (Spring Quillwort). Acid mountain lake, Glaslyn, SN89, A.J.Morton, 1982, det. A.M.Paul; +also acid mountain lake, Llyn Penrhaeadr, SN79, A.J.Morton, 1985.

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21/3. *Dryopteris oreades* Fomin (Mountain Male-fern). Above Llangynog village, SJO426, A.P.Dawes, 1988, conf. P.M.Benoit.

+98/4. *Barbarea verna* (Miller) Ascherson (American Winter-cress). Twenty plants on newly disturbed roadside bank, Llanfair Caereinion, SJ10, M.Wainwright, 1988, det. T.Rich. Second record.

\*113/9b. *Viola palustris* L. subsp. *juessii* (Link ex K.Wein) Coutinho (a marsh violet). In *Salix*-carr, Troed-yr-esgair, Aberllefenni, SH71, P.M.Benoit, 1988.

\*122/1. *Elatine hexandra* (Lapierre) DC. (Six-stamened Waterwort). North shore of acid mountain lake, Llyn Du, 5.5km NNW of Caersws, SO09, I.C.Trueeman et al., 1984.

+154/14. *Chenopodium rubrum* L. (Red Goosefoot). Two sites on spoil-heaps at Carreghofa, SJ2421 & 2521, H.Webster, 1988.

+192/24. *Trifolium micranthum* Viv. (Slender Trefoil). Near Green Hall, Llanfyllin, SJ1618, P.M.Benoit & M.Oliver, 1988.

!226/2b. *Prunus domestica* subsp. *insititia* (L.) C.K.Schneider (Bullace). Hedge near Hen Neuadd to the W of Llanidloes, SN9184, J.A.Green, 1988.

+325/18. *Rumex maritimus* L. (Golden Dock). Upper pool at Lymore, SO2396, J.M.Roper, 1988.

+370/5. *Lysimachia punctata* L. (Dotted Loosestrife). One plant, far from habitation, on wooded roadside, N side of B4393 near Pont Ysgadan, SJ01, M.Wainwright, 1988.

+403/1. *Echium vulgare* L. (Viper's-bugloss). Many plants on edge of upper car park at Clywedog Dam, SN9188, M.Oliver, 1988.

\*462/3. *Lamium hybridum* Vill. (Cut-leaved Dead-nettle). Several plants with *Lamium amplexicaule*, *L. purpureum* and other weeds on patch of newly-dug soil, Llanymynech golf course, SJ22, P.M.Benoit & M.Wainwright, 1988. First record.

+1522/1. *Conyza canadensis* (L.) Cronq. (Canadian Fleabane). A sizeable colony between river and road at Llandinham, SO0288, C.A.Small, 1988.

\*558/1/105. *Hieracium orimeles* F.J.Hanb. ex W.R.Linton (a hawkweed). Shaded bank by track, Dulas Valley, Aberhosan, SN89, A.J.Morton, 1986.

+606/4. *Luzula luzuloides* (Lam.) Dandy & Wilmott (White Wood-rush). A few plants in Great Wood, Gregynog Hall, Tregynon, SO09, T.Kohler, 1987. Second record.

\*670/8. *Festuca ovina* subsp. *ophiolicola* (Kerguelen) M.Wilkinson (a sheep's-fescue). Marshy area with *Juncus effusus* dominant and much *Nardus* just N of Afon Hengwm, S side of Carn Hyddgen, SN78, A.O.Chater, 1988, det. M.Wilkinson.

\*670/9. *Festuca tenuifolia* Sibth. (Fine-leaved Sheep's-fescue). Dry hummocks in level bog near Llanfihangel-yng-Ngwynfa, SJ01, P.M.Benoit, 1988. First certain record for Monts.

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\*677/1. *Catabrosa aquatica* (L.) Beauv. (Whorl-grass). A few plants seen at margin of a recently dug pool, Montgomery Canal Reserve, Wern Clay Pits, Arddleen, SJ21, I.Gunn & K.Edwards, 1987. First record.

\*683/1. *Bromus erectus* Hudson (Upright Brome). Limestone grassland, Llanymynech Hill, SJ22, P.M.Benoit, 1988. First record.

\*683/3. *Bromus benekenii* (Lange) Trimen (Lesser Hairy-brome). Wooded dingle near Llanfihangel-yng-Ngwynfa, SJ01; +also several plants with abundant *Bromus ramosus* base-rich woodland, Abermule Dingle, SO19, both P.M.Benoit, 1988. First and second records.

CAERNARFON, v.c. 49 (N.H.Brown)

+2/2. *Selaginella selaginoides* (L.) Link (Lesser Clubmoss). Abergeirch, SH2640, A.Vaughan Jones, 1971, A.P.Conolly, 1988.

+22/2cam. *Dryopteris affinis* subsp. *cambrensis* Fraser-Jenkins (a buckler-fern). Near Rhoshirwaen N of Aberdaron, SH2119, A.P.Conolly, 1988, det. C.R.Fraser-Jenkins.

+!65/4. *Corydalis lutea* (L.) DC. (Yellow Corydalis). East facing roadside slate wall, Porthmadog, SH5638, R.E.Hughes, 1988.

+!71/1. *Hirschfeldia incana* (L.) Lagreze-Fossat (Hoary Mustard). One plant in dune grassland, The Beacons, Conwy Morfa, SH7678, J.A.Green & T.C.G.Rich, 1987. Abundant in the Llandudno area since at least 1985 and obviously spreading.

+!84/1. *Thlaspi arvense* L. (Field Penny-cress). Weed in nursery rose beds, Conway Valley Nursery between Groes Hotel and Talycafn, SH7873, R.Lewis, 1988.

+95/gla. *Erophila glabrescens* Jordan (a whitlowgrass). Garden weed, Iolyn Park, Henryd, SH7775, W.H.Tucker et al., 1987, det. T.C.G.Rich.

+102/4. *Rorippa palustris* (L.) Besser (Marsh Yellow-cress). Pool, Hirdre-fawr, Cwmistir Heath, SH2438, A.P.Conolly, 1988, conf. T.C.G.Rich.

+!108/5. *Sisymbrium altissimum* L. (Tall Rocket). Deganwy, SH7878, G.Battershall et al., 1987.

+113/9. *Viola palustris* L. (Marsh Violet). Abergeirch Marsh, SH2640, A.P.Conolly, 1988.

+115/14. *Hypericum elodes* L. (Marsh St John's-wort). Abergeirch, SH2640, A.Vaughan Jones, c.1971.

+!131/03. *Cerastium tomentosum* L. (Snow-in-Summer). One patch on bank of old field, The Beacons, Conwy Morfa, SH7678, J.A.Green & T.C.G.Rich, 1987.

\*160/2. *Salicornia dolichostachya* Moss (a glasswort). Outer harbour, Pwllheli, SH3734, A.P.Conolly, 1988, det. D.H.Dalby. First record.

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- \*160/4. *Salicornia ramosissima* J.Woods (Bushy Glasswort). Abersoch harbour, SH3128; +also outer harbour, Pwllheli, SH3734, both A.P.Conolly, 1988, det. D.H.Dalby. First and second records.
- +!173/2. *Acer platanoides* L. (Norway Maple). Deganwy, SH7878, G.Battershall et al., 1987.
- +!178/1. *Buxus sempervirens* L. (Box). Deganwy, SH7878, G.Battershall et al., 1987; and in woodland above Marl Hall, Llandudno Junction, SH7978, R.Lewis, 1988.
- \*!184/1. *Laburnum anagyroides* Medicus (Laburnum). Deganwy, SH7878, G.Battershall et al., 1987.
- +192/19. *Trifolium fragiferum* L. (Strawberry Clover). Damp groove in field, Bardsey Island, SH1121, M.Atkinson, det. K.Spurgin. Previously recorded only from the extreme north coast of v.c. 49.
- +207/9. *Lathyrus palustris* L. (Marsh Pea). Clambering through *Phragmites australis* along drainage channel and extending a short distance into adjoining field, c.0.5km S of Caerhun Church and Roman Fort near Tyn-y-Groes, SH7769, R.Lewis, 1988. Three further colonies were notes in the same 1km square in 1988. All four colonies are additional to that recorded in 1987.
- \*207/11. *Lathyrus montanus* var. *tenuifolius* (Roth) Garcke subvar. *angustissimus* (Rouy) Asch. & Graeb. (a bitter-vetch). Very boggy ground on bank of River Cwmllan, Cwmllan near Nantgwynant, SH6251, Lars J.Larsen, 1988. First record for variety.
- \*225/1x8scan. *Rosa x wheldonii* Wolley-Dod (*R. arvensis* x *R. canina*) (a hybrid rose). W end of Porth Neigwl, below Rhiw, SH2327, A.P.Conolly, 1988, det. A.L.Primavesi. First record.
- 225/8scan. *Rosa canina* L. s.s. (Dog-rose). The segregate has now been recorded from several 10km squares in the Llyn Peninsula, +SH12, +SH13, +SH22, +SH23, +SH24, +SH32, +SH33, all A.P.Conolly, 1988, conf. A.L.Primavesi.
- 225/8dum. *Rosa dumetorum* Thuill. (Thicket Dog-rose). +Uchmynydd, SH1525, A.P.Conolly, 1988, conf. A.L.Primavesi.
- +235/2b. *Sedum telephium* L. subsp. *fabaria* (Koch) Kirschleger (Orpine). Grass verge at side of lane on E side of B5106, c.0.75km N of Tyn-y-Groes, SH7872, R.Lewis, 1988.
- +!235/11. *Sedum reflexum* L. (Reflexed Stonecrop). Garden throw-out, The Beacons, Conwy Morfa, SH7678, J.A.Green & T.C.G.Rich, 1987.
- +242/1. *Chrysosplenium oppositifolium* L. (Opposite-leaved Golden-saxifrage). Near Gyfelan-fawr, SH1932, A.P.Conolly, 1988.
- +293/1. *Conopodium majus* (Gouan) Loret (Pignut). Near Methlem, SH1730, A.P.Conolly, 1986.
- +319/2. *Euphorbia lathyris* L. (Caper-spurge). At base of garden wall, roadside at junction of B5106 & B5279 at Tyn-y-Groes, SH7771, R.Lewis, 1988.

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- +325/18. *Rumex conglomeratus* Murray (Clustered Dock). Near Trefgraig, SH1831, 1986; SH1931, 1988, both A.P.Conolly, 1988.
- +1342/4. *Populus nigra* L. s.s. (Black Poplar). Three trees in hedgerow, 0.5km N of Roewen, SH7572, R.Lewis, 1988, conf. N.Brown.
- +362/2. *Callitriche platycarpa* Kutz (Various-leaved Water-starwort). Penrhos marshes, SH3433, A.P.Conolly & A.Vaughan Jones, 1971, det. C.A.Stace, 1988.
- +1378/2. *Ligustrum ovalifolium* Hassk. (Garden Privet). Deganwy, SH7878, G.Battershall et al., 1987.
- +1393/1. *Borago officinalis* L. (Borage). Spontaneous weed in ancient garden near church, Llaniestyn, SH2463, A.P.Conolly, 1988. Second record for mainland Lleyl although well-known on Bardsey Island.
- !406/2. *Calystegia pulchra* Brummit & Heywood (Hairy Bindweed). Clambering in hedgerow at side of lane (B5279) between Tyn-y-Groes and Talycafn, SH7771, R.Lewis, 1988.
- \*!409/2. *Lycium chinense* Miller (China Teaplat). One bush at edge of small wood near Talycafn, SH7872, J.A.Green et al., 1987.
- +!420/2. *Linaria purpurea* (L.) Miller (Purple Toadflax). Roadside hedgebank between Conway and Hendre c.0.5km SW of Conway, SH7776, R.Lewis, 1988.
- !424/5. *Scrophularia vernalis* L. (Yellow Figwort). Deganwy, SH7878, G.Battershall et al., 1987. First record since 1956 for this square.
- +445/3x5. *Mentha x gentilis* L. (*M. arvensis* x *M. spicata*) (Bushy Mint). River below Porth Dinllaen Farm, SH2740, A.P.Conolly, 1988, conf. C.A.Stace.
- +!445/4x5. *Mentha x piperita* L. (*M. aquatica* x *M. spicata*) (Peppermint). At side of stream in open grassland above Isallt Farm, S of lane between Roewen and Youth Hostel, c.1km W of Roewen, SH7472, R.Lewis, 1988.
- \*!461/arg. *Lamiastrum argentatum* Smejkal (Variegated Yellow Archangel). Nanhoron Woods, SH2831; +also garden refuse dump Marchros, SH3126, both A.P.Conolly, 1988. First and second records.
- +538/4. *Arctium minus* Bernh. s.s. (Lesser Burdock). Near Penllech, SH2234; +also Porth Dinllaen, SH2740; +and near, Abersoch, SH3028, all A.P.Conolly, 1988, conf. F.H.Perring.
- \*540/8. *Cirsium dissectum* (L.) Hill (Meadow Thistle). Wellington marsh, Mynyddo, SH33, E.M.Pulford, 1988, conf. T.Blackstock. First record.
- +!546/1. *Cichorium intybus* L. (Chichory). On bank of new road, Iolyn Park, Henryd, SH7775, W.H.Tucker et al., 1987.
- +558/1/240b. *Hieracium umbellatum* subsp. *bichlorophyllum* (Druce & Zahn) P.D.Sell & C.West (a hawkweed). Near Trefgraig, SH1931, A.P.Conolly, 1988, det. J.Bevan & D.McCosh.

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- +558/1/241. *Hieracium vagum* Jordan (a hawkweed). Cilan, SH3025, A.P.Conolly, 1988, det. J.Bevan & D.McCosh.
- +558/1/245. *Hieracium perpropinquum* (Zahn) Druce (a hawkweed). Near Trefgraig, SH1931, A.P.Conolly, 1988, det. J.Bevan & D.McCosh.
- +561/1. *Baldellia ranunculoides* (L.) Parl. (Lesser Water-plantain). Porth Dinllaeen, SH2740, T.Blackstock, 1984; and Abergeirch marsh, SH2640, A.P.Conolly, 1988.
- +605/17. *Juncus subnodulosus* Schrank (Blunt-flowered Rush). Porth Dinllaeen marsh, SH2740, T.Blackstock, 1988; and Abergeirch, SH2640, A.P.Conolly, 1988.
- \*!607/7. *Allium carinatum* L. (Keeled Garlic). One patch with c.70 flowering heads on grassy verge of B5106 between Baclaw Farm and Groes Hotel c.3km S of Conway, SH7774, R.Lewis, 1988.
- +645/1. *Anacamptis pyramidalis* (L.) L.C.M.Richard (Pyramidal Orchid). On exposed limestone crags in woodland above Marl Hall, Llandudno Junction, SH7978, R.Lewis, 1988.
- +653/1. *Typha latifolia* L. (Bulrush). Llangian-Abersoch gorge, SH3028, A.P.Conolly, 1988.
- +656/6. *Eleocharis uniglumis* (Link) Schultes (Slender Spike-rush). Porth Oer, SH1629, A.P.Conolly, 1988.
- \*670/6. are. *Festuca rubra* subsp. *arenaria* (Osbeck) Syme (a red fescue). Drift cliff, Porth Towyn, Tudweiliog; +also dunes to the W end of Pwllheli towards Llanbedrog, SH3634, both A.P.Conolly, 1988, det. A.K.Al-Burmani. First and second records.
- \*670/6lit. *Festuca rubra* subsp. *litoralis* (G.F.W.Meyer) Auquier (a red fescue). S of Porth Oer, N of Aberdaron, SH1629; +also dunes to the N end of Borth Fawr, Abersoch, SH3127, both A.P.Conolly, 1988, det. A.K.Al-Burmani. First and second records.
- !692/1. *Avena fatua* L. (Wild-oat). Roadside verge, east side of B5106 between Bachlaw Farm and Groes Hotel c.3km S of Conway, SH7774, R.Lewis, 1988.
- DENBIGH, v.c. 50 (comm. Mrs J.A. Green)
- 1/5. *Diphasiastrum alpinum* (L.) Holub (Alpine-clubmoss). Forestry plantation, SJ1660, P.Day, 1988.
- 16/1. *Asplenium ceterach* L. (Rustyback). One plant on mortared wall of farm, Taiteg near Melin y Wig, SJ0449, J.A.Green, 1988.
- 46/22b. *Ranunculus peltatus* Schrank (Pond Water-crowfoot). Llyn Beidiog near Llansannan, SH9165, D.Tinston, 1988
- +48/1. *Myosurus minimus* L. (Mousetail). Many plants in farm lane near Worthenbury, SJ4146, G.Kaye, 1988.

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- +55/1. *Nymphaea alba* L. (White Water-lily). Pond surrounded by woodland, Coed Cerrig y Wyalit c.1.7km S of Talycafn, SH7870, R.Lewis, 1988.
- \*165/1. *Corydalis solida* (L.) Swartz (Bird-in-a-bush). Old garden 100yds from burnt out building, SJ4047, G.A.Spencer, 1988.
- 75/1. *Crambe maritima* L. (Sea-kale). Two plants on shingle by promenade, Pensarn, SH9478, P.Day, 1988.
- +80/2. *Coronopus didymus* (L.) Sm. (Lesser Swine-cress). Several plants in farm lane near manure heap, Penley near Bangor on Dee, SJ4142, J.A.Green, 1988. Second record.
- +1100/3. *Arabis caucasica* Schlecht. (Garden Arabis). Old quarry face, Pen y Graig, Froncysyllite, SJ2640, G.Emery, 1988. Second record.
- +\$123/12. *Silene noctiflora* L. (Night-flowering Catchfly). Weed in field of *Brassica*, Llansantffraid Glan Conway, SH7974, R.Lewis, 1988. Second record.
- \*1141/6. *Arenaria balearica* L. (Mossy Sandwort). Two patches on rock of cutting by gatehouse on lane behind Old Rectory wall, Glan Conway, SH8076, E.Chicken, 1988. First record.
- +166/1. *Linum bienne* Miller (Pale Flax). Uncultivated grassy bank, Aberconway Nursery, Graig, c.1km S of Llansantffraid Glan Conway, SH7974, R.Lewis, 1988.
- +166/2. *Linum usitatissimum* L. (Flax). Several plants setting seed on verge of new Ruabon bypass, Ruabon, SJ3043, Capt.Bell & M.Roberts; +and SJ2943, G.A.Spencer, both 1988. First and second post-1930 records for Denbs.
- \*1211/8. *Rubus spectabilis* Pursch (Salmonberry). Isolated colony naturalized on canal edge, Llangollen, SJ1943, G.A.Spencer, 1988, conf. A.Newton. First record.
- +1215/3. *Fragaria x ananassa* (*F. chiloensis* x *F. virginiana*) (Garden Strawberry). Steep grassy bank, roadside, E side of A470 c.0.5km S of Talycafn, SH7870, R.Lewis, 1988.
- +1239/5x4. *Saxifraga x urbium* D.A.Webb (*S. spathularis* x *S. umbrosa*) (Londonpride). Edge of woodland, Coed Ty Gwyn W of Eglwys bach, SH7970, R.Lewis, 1988.
- +320/10. *Polygonum lapathifolium* L. (Pale Persicaria). In field cultivated with *Brassica* sp. S of Garth, c.0.75km S of Llansantffraid Glan Conway, SH7974, R.Lewis, 1988.
- +343/11x12b. *Salix x reichardtii* A.Kerner (*S. caprea* x *S. cinerea*). Wet ditch, Wrexham Industrial Estate, SJ3849, J.A.Green, 1988, det. R.D.Meikle.
- \*1345/1. *Rhododendron luteum* Sweet (Yellow Azalea). Numerous bushes, sometimes dominant in wet ground in wood, Coed Cerrig y Wyalit near Talycafn, SH7870, probably planted originally but now seeding freely; +also in woodland surrounding Llyn Syberri c.2km S of Talycafn, SH7869, both R.Lewis, 1988. First record and second records.

Denbigh / Flint

+357/8. *Erica vagans* L. (Cornish Heath) Edge of limestone cliff, Rhyd y Foel near Llandulas, SH9177, P.Day, 1988. Second record; possibly windblown.

+425/3. *Mimulus moschatus* Douglas ex Lindley (Musk). Edge of permanent pasture, Whitewell, SJ4841, NCC Pond Survey, 1979. Second localized record.

+462/3. *Lamium hybridum* Vill. (Cut-leaved Dead-nettle). In field cultivated with *Brassica* sp. S of Garth, c.0.75km S of Llansantffraid Glan Conway, SH7974, R.Lewis, 1988. First post-1930 record for the square.

561/1. *Baldellia ranunculoides* (L.) Parl. (Lesser Water-plantain). Found in 9 ponds in grid squares +SJ3949; +SJ4647; +SJ4050, all NCC Pond Survey, 1979; refound in another field pond in SJ4141, D.Tinston, 1988.

\*578/1. *Groenlandia densa* (L.) Fourr. (Opposite-leaved Pondweed). Field pond, Gresford, SJ3755, NCC Pond Survey, 1979. First record.

+1605/2. *Juncus tenuis* (Slender Rush). Numerous plants on farm track near Dinmael, SH0046, J.A.Green, 1988. Third record.

+663/24. *Carex pallescens* L. (Pale Sedge). Wet meadow, Burton near Honckley, SJ3559, J.A.Green, 1988.

+669/4. *Glyceria maxima* (Hartman) Holmberg (Reed Sweet-grass). Marshy ground partly drying out in summer, N of lane between Talycafn and Graig, near Eglwys-bach, c.1km E of Talycafn, SH7971, R.Lewis, 1988.

+670/4. *Festuca altissima* All. (Wood Fescue). Ten plants on mossy rocks by stream in deciduous wood, Llansannan, SH9261, J.A.Green, 1988. Second record.

+670/1x671/1. x*Festulolium loliaceum* (Hudson) P.Fourn (*Festuca pratensis* x *Lolium perenne*) (Hybrid Fescue). Wet meadow downstream from Rhyd-y-cyffin bridge, Penley, Bangor on Dee, SJ4141, G.Kaye, 1988. Second record.

+677/1. *Catabrosa aquatica* (L.) Beauv. (Whorl-grass). Ditch in marshy grassland, bank of River Conway near Talycafn bridge, SH7871, R.Lewis, 1988.

+708/1. *Alopecurus myosuroides* Hudson (Black-grass). Farmyard, Llanfihangel Glyn Myfer, SJ0048, J.A.Green, 1988. Second post-1930 record.

\*!720Pan/mil. *Panicum miliaceum* L. (Common Millet). Roadside, Gresford, SJ3454, A. Storkey, 1988. First record.

FLINT, v.c. 51 (comm. G. Wynne)

+!70/2. *Sinapis alba* L. (White Mustard). Rhuddlan, SJ0279, T.C.G.Rich, 1987. Third post-1930 record.

+115/12. *Hypericum hirsutum* L. (Hairy St John's-wort). Dune grassland, The Warren, Point of Ayr, SJ1184, R.D.Pryce, 1988.

Flint

- +133/3. *Stellaria pallida* (Dumort.) Pire (Lesser Chickweed). Dyserth, SJ0678, W.Hay & E.Phenna, 1987; and St Asaph, SJ07, J.A.Green, 1988. Second and third post-1930 records.
- \*187/3. *Ulex minor* Roth (Dwarf Gorse). Apparently native on sandy heath, Twthill near Rhuddlan Castle, SJ0277, D.J.Tinston, 1988, det. P.M.Benoit. First record.
- +1190/6. *Medicago arabica* (L.) Hudson (Spotted Medick). St Asaph, SJ0374, B.Gale, 1988. Second post-1930 record.
- \*!Pis/sat. *Pisum sativum* L. (Garden Pea). Ewloe Castle, SJ2867, J.A.Green, 1988. First record.
- +222/1. *Sanguisorba officinalis* L. (Great Burnet). Bryn Cwnin, Rhyl, SJ0279, T.C.G.Rich, 1987. Third post-1930 record.
- +1227/2. *Cotoneaster simonsii* Baker (a cotoneaster). Bodfari, SJ07, G.Wynne, 1987. Third post-1930 record.
- +1445/7. *Mentha suaveolens* Ehrh. (Round-leaved Mint). River Elwy, St Asaph, SJ07, Anne Daly, 1988, det. G.Hutchinson. First post-1930 record.
- 514/5. *Logfia minima* (Sm.) Dumort. (Small Cudweed). Waste ground, Industrial Estate near Flint Castle, SJ2473, P.Day et al., 1988. First post-1930 record.
- \*!Gai/ari. *Gaillardia aristata* Pursh. (Blanket Flower). Dune grassland, Talacre, Point of Ayr, SJ1184, R.D.Pryce, 1988. First Welsh record.
- \*!544/2. *Centaurea montana* L. (Perennial Cornflower). Roadside verge, Graig, Tremeirchion, SJ0872, W.H.Tucker et al., 1987. First record.
- \*!589/3. *Ornithogalum pyrenaicum* L. (Spiked Star-of-Bethlehem). Point of Ayr, SJ1184, P.I.Morris, 1988. First record.
- +650/4. *Lemna gibba* L. (Fat Duckweed) Bryn Cwnin, Rhyl, SJ0279, T.C.G.Rich, 1987. First post-1930 record.
- \*656/4. *Eleocharis multicaulis* (Sm.) Desv. (Many-stalked Spike-rush). Marsh half a mile SW of Llyn Helyg, SJ1076, J.A.Green, 1988, det. G.Hutchinson. First record.
- +663/56. *Carex diandra* Schrank (Lesser Tussock-sedge). Mesotrophic mire, Licswm, SJ17, P.Day, 1988.
- +669/1x2. *Glyceria x pedicellata* Townsend (*G. fluitans* x *G. plicata*) (Hybrid Sweet-grass). Rhuddlan, SJ0276, D.J.Tinston, 1987. Third post-1930 record.
- +1683/19. *Bromus carinatus* Hooker & Arnott (California Brome). Rhuddlan, SJ0278, T.C.G.Rich, 1987, det. T.Cope. Second record.

Anglesey

ANGLESEY, v.c. 52 (comm. R.H.Roberts)

21/6. *Dryopteris carthusiana* (Vill.) H.P.Fuchs (Narrow Buckler-fern). Acid bog, Cors Bodwrog, SH4177, R.H.Roberts, 1988.

46/20. *Ranunculus circinatus* Sibth. (Fan-leaved Water-crowfoot). Lateral ditch of Afon Cefni SE of Parc Sais, SH4572, C.D.Preston & N.F.Stewart, 1988.

\*343/2x4. *Salix x rubens* Schrank (*S. alba x fragilis*) (a hybrid willow). With *Salix aurita* and *S. cinerea* subsp. *oleifolia* on E margin of Llyn yr Wyth-aidion, SH4781, C.D.Preston & N.Stewart, 1988, det. R.D.Meikle.

+\$343/11x9. *Salix x sericans* Tausch ex A.Kerner (*S. caprea x S. viminalis*) (a hybrid willow). Several bushes, apparently planted originally growing on E side of Llyn Maelog; and W bank of inflow stream S of Llyn Maelog, both SH3272, C.D.Preston & N.Stewart, 1988, det. R.D.Meikle.

+577/16. *Potamogeton trichoides* Cham. & Schlecht. (Hair-like Pondweed). Lateral ditch of Afon Cefni, SH4572, C.D.Preston & N.Stewart, 1988. First record in this square for almost 200 years.

\*643/1x636/1. x*Dactylogymnadenia cockei* (H.-Harrison) Soo (*Dactylorhiza fuchsii x Gymnadenia conopsea*) (a hybrid orchid). Disused limestone quarry, Talwrn, SH4977, N.H.Brown, 1988. First record.

677/1. *Catabrosa aquatica* (L.) Beauv. (Whorl-grass). Main ditch, Cors Bodwrog, below Bodewran, SH4077; ditch near Bodrwyn, Cerrigceinwen, SH4173, both R.H.Roberts, 1988.

