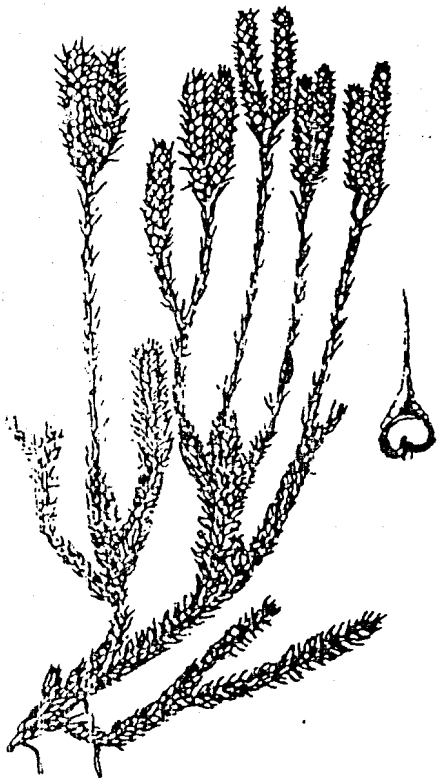
BOTANICAL SOCIETY OF THE BRITISH ISLES

WELSH BULLETIN

Editor: I.K.Morgan

No. 41, SPRING 1985



Stag's-Horn Clubmoss (*Lycopodium clavatum*). Natural size
From Welsh Ferns. Sixth Edition 1978

CONTENTS

EDITORIAL

I would like to thank all those who have contributed articles to this second Welsh Bulletin under my editorship and I hope that for the next Bulletin, members will continue to give their support by sending as many articles as possible. Obviously for a publication such as the Welsh Bulletin to be successful a constant flow of articles is needed, so please excuse me if I write from time to time asking for such articles.

In contrast to the damp, mild weather enjoyed up to late December, which resulted in late flowering of both wild and cultivated plants - described by Miss Powell in her article - later Arctic-like weather exerted a tremendous toll on various cultivated plants that normally survive our Welsh winters. But how did this severe winter affect naturalized populations (e.g. plants of Mediterranean origin) in Wales? Nigella damascena for example, strongly established in my garden was decimated by the frosts, though a few plants did survive. Similarly Selaginella kraussiana described as surviving 'normal' winters outdoors in my Carms. Pteridophyte article, was likewise almost exterminated; only a few fragments surviving. These unusually severe winters therefore, could have a significant effect on plant distributions, being just one of many factors that collectively determine a species distribution. Any observations will be welcomed.

In the Bulletin a sad short note informs us of the passing away of a very well-liked BSBI member in Wales, Miss Doris Pugh. I only met her on a couple of occasions, but like others the impression I received was of a friendly, kind and enthusiastic botanist. She will be missed, I am sure, by members all over (and beyond) Wales.

Finally, my gratitude goes to Gwynn Ellis for the large amount of assistance he has given me with production of the Welsh Bulletin.

HON. SECRETARY'S REPORT

Annual General Meeting, 1984

The twenty-second Annual General Meeting of the B.S.B.I. Wales, was held at the Menai Centre near Menai Bridge, Anglesey on July 13, 1984.

On Saturday morning Mr N. Brown conducted a group of early arrivals around the Botanic gardens of the University College of North Wales, Bangor. Mr Brown is in charge of the gardens and showed members many of the interesting plants being grown there and was also able to give some insight into the functions and workings of a University Botanical Garden where much of the emphasis is on research.

After lunch, the afternoon session was opened by the Chairman Mr M. Porter who welcomed members to the meeting. He then introduced Mr Nigel Brown and after thanking him for arranging and conducting the tour of the botanic gardens invited him to give his talk on the "Flora of Anglesey". The audience was held spellbound as Nigel with the aid of beautiful colour transparencies gave us a marvellous review of the Anglesey flora in a very comprehensive talk.

The AGM which followed was dull by comparison. After apologies for absence and the signing of the Minutes of the previous years AGM the Chairman mentioned that one of the main events since last years AGM had been the publication of 'Flowering Plants of Wales' by R.G. Ellis the Hon. Secretary and offered his congratulations on its production.

The Secretary then gave his report on the previous years activities. He announced the decision of Mr R.H. Roberts to resign as editor of the January issue of the Welsh Bulletin and proposed a vote of thanks to Mr Roberts for all his work on behalf of the Society and for the consistent high standard of the Bulletin under his editorship. This was carried by acclamation. He then reported that Mr I.K. Morgan of Llanelli had agreed to take over as editor of both issues of the Bulletin and urged members to take a more active role in the Society by producing items for publication. He referred to two changes in vice-county recorders in Wales: Mr J. Brummitt had reluctantly resigned as recorder for Denbighshire, being replaced by Mrs J.A. Green and R.G. Ellis had resigned as recorder for Glamorgan being replaced by Dr Quentin Kay and Mr Jeff Curtis who would split the county between them.

Among the items discussed at length by the Committee for Wales were the recently published document "Nature Conservation Strategy"; the problems of reseeding old opencast sites with foreign seed of native

species and a Mapping Scheme to be launched in 1987 which will resurvey c. 10% of the 10 km squares in Britain in an attempt to discover which species were increasing or decreasing in numbers.

The Committee had also decided to embark on a new campaign to recruit and keep new members to the Society and the Secretary asked members to help in this by forwarding any ideas they may have on this matter to him. He then reported on the field meetings held since the last AGM and thanked leaders for their efforts. (A.O. Chater; S.B. Evans; Mrs J. Green and G. Wynne; R.G. Woods & Dr Q. Kay). He reminded members of the field meeting to be held the following day at Bwrdd Arthur led by N. Brown and of three further meetings to be held in 1984 and drew particular attention to the Recording Weekend in Carmarthen. He then gave details of the 1985 AGM and field meetings which are listed on page 00.

Finally he thanked the Officers of the Menai Centre for their hospitality and Nigel Brown who organized the meeting.

FINANCIAL REPORT

The Hon. Treasurer Mr R.D. Pryce reported that the main sources of income to the Society in Wales were the contributions from the Treasurer of the BSBI and the subscriptions to the Welsh Bulletin from members living outside Wales. The main item of expenditure was the Welsh Bulletin. The February issue produced in North Wales was of a very high standard but because it was printed rather than photocopied it cost over twice as much as the July issue; the Committee for Wales had therefore decided that to reduce costs, in future both issues be produced in Cardiff by photocopying.
The Balance Sheet presented on the next page covers the twelve months to December 31, 1984.

BALANCE SHEET

SUMMARY OF FINANCIAL ACCOUNTS FOR THE YEAR ENDING 31 DECEMBER 1984

INCOME		EXPENDITURE	
Excess income over expenditure (1983)	203.23	Bulletin 38: Distribution	34.50
Bulletin subscriptions from outside Wales	58.80	Bulletin 39: Printing	124.00
Bulletin back numbers	64.00	Distribution	15.15
From B.S.B.I. Treasurer	100.00	Supplement	50.00
Anglesey A.G.M.	522.90	Photocopying back numbers	30.00
Carmarthen Meeting	309.51	Donation: Whitland School	5.00
Interest	8.69	Anglesey A.G.M. accom.	527.00
		Carmarthen accom.	318.44
		Bulletin 40: Production	60.00
		Distribution	39.82
		Adjustment	1.98
Total	1267.13		1205.89

Excess Income over Expenditure:	61.24	
SPECIAL ACCOUNT		137.00
Carried forward from 1983	75.76	
Current Account Balance:	11.96	
Deposit Account Balance:	125.04	Cash in Bank 137.00

Richard D. Pryce (Treasurer)

ELECTION OF OFFICERS

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

Committee Members

Mrs M.E.R. Perry, Mr S.B. Evans, Dr Q. Kay and Mr G. Wynne were due to retire under Rule 5 of the Constitution and were eligible for immediate re-election. Mrs Perry had decided not to stand again but the other three retiring members were willing to do so. There was therefore a vacancy on the Committee. Mr I.K. Morgan was nominated by the Committee but had not yet been approached. In the absence of any nominations from the floor the three retiring members were duly re-elected and a decision made to invite Mr I.K. Morgan to sit on the committee as a co-opted member until next years AGM when he could be formerly elected.

In reply to a question from Mr T.G. Evans about where field meeting reports should be sent - to 'Watsonia' or the 'Welsh Bulletin', it was suggested that a 250 word report be sent to 'Watsonia' and a larger report if considered necessary to the 'Bulletin'.

This concluded the business of the AGM.

COMMITTEE FOR WALES, 1984-85

Following the election of Officers and Members at the AGM, the composition of the Committee for Wales for 1984-85 is as follows:

Chairman	Mr M. Porter
Vice-Chairman	Mrs J. A. Green
Secretary	Mr R.G. Ellis
Treasurer	Mr R.D. Pryce

Committee members:

Mr T. Blackstock*	Mr S.B. Evans
Mr N. Brown*	Dr Q.O.N. Kay
Mr T.G. Evans*	Mr G. Wynne
Mr R.G. Woods*	Mr I.K. Morgan (co-opted)

ANNUAL GENERAL MEETING AND WELSH

EXHIBITION MEETING, 1985

The 23rd AGM and 3rd Welsh Exhibition Meeting will be held at St David's University College, Lampeter, Dyfed on July 20, 1985. The AGM is this year being held in conjunction with a meeting to assist with recording for the Flora of Carmarthenshire.

Programme:

10.00 am	Tetrad recording
1.00 pm	Lunch
1.30 pm	Meeting of Committee for Wales
2.30 pm	Progress on the Carmarthenshire Flora by R.D. Pryce
3.30	AGM
4.00 pm	Tea
4.30 pm	Welsh Exhibition Meeting - Exhibits, short talks with slides etc.
6.30 pm	Dinner
7.30 pm	Exhibition meeting (continued)

If you intend bringing an exhibit or slides, please let the Secretary know in advance.

Accommodation is available at St David's Halls of Residence at £12.80 per night, full board from 19 - 22 July. All BSBI members and their guests are welcome.

Further details can be obtained from the Secretary to the Committee for Wales : Mr R.G. Ellis, Department of Botany, National Museum of Wales, Cardiff CF1 3NP. Please apply before June 1.

Nominations for membership to the Committee for Wales or for the posts of Hon. Secretary or Hon. Treasurer should be made in writing with the signature of the nominee before 1 June to the Hon Secretary at the above address.

FIELD MEETINGS, 1985

Friday 3 May to Monday 6 May — Newbridge-on-Wye, Powys
Leaders: Mr C.C. Haworth and Dr A.J. Richards

This meeting is for the purpose of recording the Taraxacum flora of the area.

Saturday 8 June & Sunday 9 June — Cardiff, Glamorgan
Leaders: Mr J. Bevan and Mr R.G. Ellis

A meeting of the Hieracium study group based at the National Museum of Wales, Cardiff. Please apply for details to Mr J. Bevan, 23 Priory Street, Cambridge CB4 3QH, before 8 May.

Sunday 16 June — Point of Ayr, Clwyd
Leaders: Mr G. Wynne and Mrs J. Green

A 2-mile dune system with extensive dune slacks and a salt-marsh will be explored. The site also possesses a Little Tern colony.

Sunday 23 June — Soden Valley, near Newquay, Dyfed
Leader: Mr A.O. Chater

A visit to rich woodland and an area of coastal heath and grassland on National Trust land NE of Cwmtudu.

Sunday 30 June — Kenfig Burrows, Glamorgan
Leader: Mr J.P. Curtis

A visit to this classic site with a very rich flora in the dunes, slacks and the freshwater pool.

Saturday 6 July — Cwmglas Mawr, Snowdon, Gwynedd
Leader: Mr N. Brown

A visit to one of the most famous arctic-alpine sites in Snowdonia.

Friday 19 July to Sunday 21 July — Lampeter, Dyfed
Leader: Mr R.D. Pryce

A recording weekend for the Flora of Carmarthenshire. The purpose is to record in some of the poorly-worked tetrads in the north of the county. (In conjunction with BSBI Wales AGM at Lampeter).

Sunday 21 July — Teifi Valley Ox-Bows, Dyfed
Leader: Mr S.B. Evans

A visit to a small fen, & relict ox-bow lake; Afon Teifi and Llyn Pencarreg. (In conjunction with BSBI Wales AGM at Lampeter).

Sunday 1 September — Brynberian Moor, Preseli Hills, Dyfed
Leader: Mr S.B. Evans

A visit to a soligenous mire and lowland heath complex.

For details of any of the above meetings, please write to the Hon. Secretary at least one month in advance.

IN MEMORIAM DORIS E. PUGH

Doris Pugh will be well known to members who botanised in Montgomeryshire or Shropshire especially near her beloved Llanymynech Rocks. Her boundless enthusiasm was matched by her hospitality as many tired and thirsty botanists will remember. Doris took over as vice-county recorder for Montgomery in 1977 and had just initiated a project to prepare a "Flora of Montgomery" when she suffered a stroke in September 1984. Although seemingly making progress, she never recovered and died peacefully on February 16, 1985. Welsh and especially Montgomeryshire botany is all the poorer for her passing. The Flora Project will continue and will, when completed, form a fitting Memorial to a very special Lady.

May she rest in Peace

CARMARTHENSHIRE PTERIDOPHYTES

I.K. Morgan and R.D. Pryce.

Introduction. Carmarthenshire has a rich pteridophyte flora and in this article the status of all taxa recorded in the county is given together with notes on their ecology and dot maps showing their distribution. It is hoped that one purpose of this paper will be to stimulate further recording and research into the ferns and fern allies of the county. The scientific and English names are those used by C.N. Page in 'The Ferns of Britain and Ireland' 1982.

A Systematic List

LYCOPODIACEAE

Lycopodium clavatum (Stag's Horn Clubmoss), Huperzia selago (Fir Clubmoss) and Diphasiastrum alpinum (Fir Clubmoss). All are found on acidic rocky slopes at a few sites in the N and NE of Carms. eg. Mynydd Mallaen, Cwm Rhaeadr and Cwm Pysgotwr. The slopes on which these clubmosses occur are often north-facing.

ISOETACEAE

Isoetes lacustris (Quillwort). Two old records: one by Lightfoot at Talley on 11 July 1773 and H.J. Riddleshall's 1902 record for Llyn-y-Fan Fach. In spite of searching it has not been refound, but there is still the possibility that the species survives at Talley. If extinct at Llyn-y-Fan Fach, this is probably due to reservoir level fluctuations.

EQUISETACEAE

Equisetum hyemale (Dutch Rush). Only two sites of this scarce and distinctive horsetail are known: a strong colony on waste ground beside an old limestone quarry at Carmel and another in wet deciduous woodland at Gwempa near Llandyfaelog, only the former is extant.

E. variegatum (Variegated Horsetail). Abundant in the large coastal dune stacks of Laugharne, Tywyn and Pembrey Burrows, where, in damp depressions, it is often dominant and forms extensive swards. A small colony of this species exists also at the NW end of the larger of the Machynys Ponds, Llanelli, where it is associated with a number of small horse-grazed plants of Osmunda regalis. E. variegatum requires open conditions and apart from occurring in many western dune systems of Britain, is also found in base-enriched mountain shingles so it is interesting to quote the only inland Carms. record of plants growing by the bank of the Afon Sychlwch below Llyn-y-Fan Fach. It might occur elsewhere on the upland Old Red Sandstone.

E. fluviatile (Water Horsetail). A variable and common species of ponds, lakes, marshes and wet ground generally, from sea level to the high corrie lake of Llyn-y-Fan Fach.

E. arvense (Common Horsetail). Another common and widespread species, but found on drier ground.

E. x litorale (E. fluviatile x arvense, 'Shore Horsetail'). This hybrid is in many ways intermediate, both in morphology and habitat, between its parents and like many hybrids it is vigorous both in the growth form of the individual shoot and also in the lateral extent of some of its colonies. There is no doubt that this taxon is under-recorded but it has been confirmed from Capel Hendre, the lower Gwendraeth Fawr flood plain, Pontyberem and near the Witchett Pool, Laugharne. Habitats in Carms. include wet roadside verges, railwaysides and damp, sandy marshland.

E. sylvaticum (Wood Horsetail). This delicate horsetail occurs in shaded situations, usually damp flushed sites on acidic soils, growing best where the shade is not too intense. It has been frequently recorded in suitable habitats from the coalfield, where colonies tend often to be quite substantial, but less frequently inland where agricultural practices may have contributed to its scarcity.

E. palustre (Marsh Horsetail). Fairly common along the coast and main river valleys, growing in more base-rich and open situations than E. sylvaticum. Where suitable base enrichment occurs, it can be also found on upland flushes e.g. below Pont Clydach (Mynydd Du).

E. telmateia (Giant Horsetail). This large horsetail is scarce in the county and it too requires base-enriched flushes for successful growth. It is found in small populations in scattered localities, with the majority in the southern half of Carms.; the hybrid with the preceding species has been searched for, but not found.

OPHIOGLOSSACEAE

Ophioglossum vulgatum (Adder's Tongue). Rather a scarce but widely distributed plant of old grassland, dune slacks and some bogs. It is easily missed however, and this could contribute to under-recording and the resultant impression of scarcity. The small Adder's Tongue (O. azoricum) should be searched for in damp dune slacks and grazed headlands; it is unrecorded as yet.

Botrichium lunaria (Moonwort). A decidedly scarce plant of mature dunes and old pastures, mostly coastal but with a handful of inland records.

OSMUNDACEAE

Osmunda regalis (Royal Fern). Though listed by R.F. May as 'rare', this species is a frequent and characteristic fern of the acidic Millstone Grit - Coal Measure outcrop of SE Carms. Here colonies cover large areas of damp peaty ground and in some of the larger of these colonies (eg. that S of Mynydd Sylen, Llanelli), the individual clumps reach massive proportions and are often well over head height. Apart from these large colonies, Osmunda may occur in small groups or as isolated individuals, growing either under full sun or in semi-shade and in a few places, woodland. The damp peaty heaths of SE Carms. hold good populations of O. regalis together with other notable and interesting species such as Myrica gale, Carum verticillatum, Genista anglica, Equisetum sylvaticum, Dactylorhiza maculatum and Fragula alnus. Hyperium elodes, Eleocharis multicaulis, Vaccinium oxycoccos and Dryopteris carthusiana occur in wetter parts. Due to improved techniques of peat extraction such wet heaths with their distinctive flora and fauna are under increasingly great threat, and are disappearing at an alarming rate, making the best worthy of protection. Several plants were transplanted from Glyntai bog and woodland to Gelli Aur, Llandeilo, before disturbance by opencast operations.

In Pembs., Cornwall and elsewhere, Osmunda grows on maritime cliffs - it is tolerant of salt spray - so it was pleasing to discover such a cliff-dwelling colony at 'Top Castle' near Amroth in July 1984, where in spite of the dry weather a trickle kept the root stocks permanently moist.

This fern's distinctive and imposing stature, coupled with its relative frequency has earned it the local Welsh name of 'Rhedyn-y-Cadno' (Fox's Fern) in SE Carms., an allusion to the resemblance of the fertile fronds to a fox's tail. The species' requirments for successful growth seems to be a mild damp maritime type climate coupled with an acidic substrate, factors which are satisfied along parts of Carmarthenshire's coastline and coastal uplands, especially the Coal Measures.

ADIANTACEAE

Cryptogamma crispa (Parsley Fern). A scree-loving montane species which has been found in the Pysgotwr valley (Cribyn Du), Craig ddu (Rhandirmwyn) and at a small quarry by Cors Farlais. All sites are in the N of the county.

HYMENOPHYLLACEAE

Hymenophyllum tunbridgense (Tunbridge Filmy Fern). Found in shady moist situations, this fern is rare in Carms. R.F. May lists 3 localities: Llandybie, Llangadog and Nant Melyn (nr. Rhandirmwyn). It was recently discovered at Glyn-hir (presumably a rediscovery of May's Llandybie record), and has also been recorded from Cwm Twrch. This species is more drought sensitive than H. wilsonii and is consequently limited to areas permanently shaded from direct sun such as damp

boulder-strewn woodland, where it may occur in dark wet crevices under the larger rocks. Due to its small size, its preferred ecological niches and its habit of growing in close proximity to luxuriant moss masses, there is always the possibility that this species is under-recorded; nevertheless it must remain, at best, a very scarce species.

H. wilsonii (Wilson's Filmy Fern). More common (though still scarce) than the preceding species, found on damp rock faces and tree boles in humid, shaded situations. Because of its ecological requirements, it is understandably more frequent in the damper upland areas of N and E Carms., occurring at such sites as Cwm Twrch, above Pont Clydach (Mynydd Du), the Rhandirmwyn area and Mynydd Myddfai. A site near the coast below Ystradfai Farm (Cwm Lliedi, Llanelli) was destroyed, many years ago when the Lower Lliedi Reservoir was built.

POLYPODIACEAE

It is unfortunate that, to the amateur botanist, the British members of this family have appeared to be so difficult to differentiate into the constituent species for with a little practice (and a microscope!) all are usually reasonably easy to determine.

Polypodium vulgare sensu stricto, (Common Polypody). This species with a typically narrow frond outline is usually found on acidic situations both on rocks and as an epiphyte on tree trunks and branches. It is common in Carms.

P. x mantoniae ('Manton's Polypody'). This hybrid shows 'hybrid vigour' forming luxuriant growths on hedgebanks and on damp wall tops where sufficient humus has accumulated. The frond outline is broader than P. vulgare and approaches P. interjectum at times, but like P. vulgare and unlike P. interjectum it has a dark-coloured annulus to the sorus; it is wise to remember though, that P. interjectum can occasionally have a dark annulus. Usually then, if a densely-growing, broad-fronded Polypody with a dark annulus is seen, one can at least suspect this hybrid. P. x mantoniae is probably quite frequent in Carms., and it too can be epiphytic. It is intermediate between the parent species in its tolerance of pH of the substrate in which it grows. It is apparently under-recorded.

P. interjectum (Western Polypody). Another common polypody, in fact in S. Carms. at least, it appears to be more frequent than P. vulgare, and unlike that species, P. interjectum is a distinct calciole, favouring calcareous rocks (it can be abundant on shaded parts of the Carboniferous Limestone north crop), lime-rich wall mortar (hence is often frequent in towns) and is even common on stabilized mature sand dunes in both sunny and shaded situations. There is an interesting distinctive variety with markedly toothed pinnules that is normally

found in continuously humid conditions such as epiphytic on often acidic humus on tree branches above streams, or on maritime cliffs. The occurrence of this form, seems to be at variance with the species' usual preference for non-acidic situations. The annulus of P. interjectum is usually the same golden colour as the rest of the sporangium; this can be seen in the field with a x 10 hand lens (as can the dark annulus of P. vulgare and P. x mantoniae).

P. australe (Southern Polypody). This handsome polypody has a limited distribution in Carms., though it is quite frequent in suitable habitats on the Carboniferous Limestone of the adjacent Gower Peninsula and in S Pembs. As both its English and scientific names suggest, it is a 'southern' species, i.e. one favouring conditions more reminiscent of the Mediterranean than NW Europe, and its distribution in Britain is expectedly in the mild SW regions.
Strong colonies can be seen along the wall tops of seaside gardens in Laugharne, these wall tops providing the necessary lime, for it is a most distinctly calciolous species in Britain, conversely in Spain I have seen it growing on a variety of rock types including acidic, rotted, chemically weathered, felspar-rich granite and Oligocene conglomerates. But in the British Isles, as with many plants on the periphery of their European distributions, it prefers base-rich situations. The main wall-top site in Laugharne, being immediately adjacent to the sea, therefore is also presumably more humid but on sunnier, drier old walls in the village itself, the plants are more stunted, closely resembling broad young plants of P. interjectum and therefore necessitating the need for caution when identifying. A plant believed to be this species (but too high up too check!) was growing on a branch of Ash (Fraxinus excelsior) near to the main Laugharne site. P. australe has also been recorded near Pendine and it also grows inland on the ancient mortared walls of the medieval castles at Cydweli (Kidwelly), Dryslwyn and Dinefwr, but in spite of searching, the species has not been found on any other old buildings. It is perhaps surprising that P. australe does not occur on the north crop of the Carboniferous Limestone that extends through Carms., even though it grows on this rock in Pembs. and Gower, it may be that the Gower sites at least, experience higher humidity but this suggestion is not persuasive.
The hybrid P. australe x P. interjectum (P. x shivasiae) has been briefly searched for but not found, though the Laugharne area seems a promising locality.

HYPOLEPIDACEAE
Pteridium aquilinum (Bracken). A widespread and often abundant species, regularly forming a dense monoculture on acidic well-drained slopes, where the tree cover has been removed.

THELYPTERIDACEAE

Thelypteris palustris (Marsh Fern). Only one old record (J.E. Griffith, 1892) exists for T. palustris, at Talley (Talyllychau) presumably from the area of marshy ground that separates the two lakes, but in spite of intensive searching it has not been re-found, though there is the chance that this fern exists elsewhere around the N lake. This continental species should be looked for in lush, marshy situations, a recent record from an upland mire in neighbouring Breconshire reminds one of the possibility of occurrence on higher ground also.

Phegopteris connectilis (Beech Fern). Frequent on damp shaded outcrops in the N and E of the county. Easily recognized by the triangulate frond outline and the fine grey-green hairs that clothe both sides of the frond when young.

Oreopteris limbosperma (Mountain Fern). A common species on flushed acidic slopes in the upland regions of Carms. Another easy fern to recognize - by the arrangement of the sori along the margins of the pinnules and its lemon-scented smell.

ASPLENIACEAE

Phyllitis scolopendrium (Hart's Tongue Fern). Common, indeed often abundant, on calcareous soils such as those derived from the Carboniferous Limestone, where together with the Soft Shield Fern (Polystichum setiferum) it is the dominant species. The unmistakable morphology renders mis-identification impossible. Older specimens have crenulate margins whilst stunted specimens are frequent on mortared walls even in urban areas.

Asplenium adiantum-nigrum (Black Spleenwort). Grows usually in non-acidic situations ranging from stunted specimens on wall mortar and on some rocks to larger individuals on steep hedgebanks or where there have been soil accumulations on base-rich rock outcrops. Widespread but not as frequent as A. trichomanes or A. ruta-muraria.

A. billotii (Lanceolate Spleenwort). Only recorded on low sandstone cliffs at Marros on the coast. This frost-sensitive species should be searched for elsewhere along the coast on non-calcareous strata or amongst walls of acidic rocks.

A. ruta-muraria (Wall Rue). A commonly occurring species on old wall mortar and less frequently also on the Carboniferous Limestone e.g. Mynydd Llangyndeyrn, Carreg Cennen and Carreg-yr-Ogof.

A. marinum (Sea Spleenwort). This maritime fern occurs in that limited area along the coast where suitable sea cliff habitat exists. A. marinum grows sparingly on the Devonian cliffs between the Tywi and Taf estuaries, and on the cliffs S of Laugharne, but larger, better-grown specimens are found E of Amroth in the Telpyn-Ragwen Point areas. Like A. billotii it is frost sensitive and grows in damp, sheltered, shaded situations such as deep joints, fault zones and caves on these seaside cliffs which afford some protection. In more open areas it is stunted in form. There is one record of it growing on a man-made structure - the old quay at Cydweli (Kidwelly) in 1969.

A. viride (Green Spleenwort). This species is mostly confined to the higher parts of the Carboniferous Limestone outcrop of Mynydd Du and calcareous bands in the underlying Old Red Sandstone eg. above Pont Clydach and the cliffs around Llyn-y-Fan Fach. It also is found on a few base-enriched outcrops in the gorge of Cwm Twrch. At some of its sites such as Carreg-yr-Ogof it occurs in fair abundance.

A. trichomanes subsp. trichomanes (Delicate Maidenhair Spleenwort). This rare subsp. is found on a handful of upland sites where damp, non-calcareous steep rock faces provide suitable growing conditions: localities such as Cribyn Du (near Allt Rhyd-y-Groes), Craig Cwm Clyd (Mynydd Myddfai), Rhuddallt and Ystradffín at Rhandirmwyn. The rocks at these sites are Siluro-Devonian sandstones, flaggy sandstones and shales; it is worth looking out for this fern on other upland, non-calcareous outcrops in the N and NE of the county.

A. trichomanes subsp. quadrivalens (Common Maidenhair Spleenwort) The commonest mural fern, the lime mortar providing its calcareous requirements, subsp. quadrivalens is often also seen growing on the Carboniferous Limestone and other base-rich outcrops.

Ceterach officinarum (Rusty-back Fern). Another mural species, again growing on old wall mortar, particularly of churchyards but much less frequent than Asplenium ruta-muraria or A. trichomanes subsp. quadrivalens. There are no records in Carms. of this species growing on limestone rock (c.f. Gower).

Those seeking excellent descriptions etc. of the hybrids in the Aspleniaceae should refer to C. N. Page's 'The Ferns of Britain and Ireland'. None have been recorded in Carms.

ATHYRIACEAE

Athyrium filix-femina (Lady Fern). A common species on moist acidic soils in woodland, bogs and wet rock outcrops, variability is wide and includes a form with a plum-coloured rachis and others with differing degrees of dissection of the pinnules. The commonest fern in wetland habitats in the county.

Gymnocarpium dryopteris (Oak Fern). This beautiful species has very much a NE distribution in Carms. as with Phegopteris connectilis but although the ranges of these two species are similar, Phegopteris is much the more frequent. G. dryopteris grows on damp, shaded, N-facing rocky hillsides and also in shaded, rocky, hillside woods; it is in the latter habitat that best growth occurs eg. the tributary valleys of the Sawdde in the Pont-ar-llechau area. It is a scarce species, but is also probably overlooked, although recognition is easy.

G. robertianum (Limestone Oak Fern). Very rare in Carmarthenshire, being confined to an area of limestone block scree below Carreg-yr-Ogof where it was first recorded by H.H. Knight in 1907. Here it occupies the damper situations amongst the limestone boulders; drier exposed areas are occupied by A. ruta-muraria and A. trichomanes subsp. quadrivalens, whilst A. viride occurs in intermediate (though still damp and often shaded) niches. G. robertianum may occur in other areas of damp, shaded limestone fissures in the Carboniferous Limestone of the county but searching has failed to reveal any additional stations. It is not immune to sheep grazing which is an unfortunate overbearing factor influencing plant distributions in upland Carms.

Cystopteris fragilis (Brittle Bladder Fern). Common on the Carboniferous Limestone outcrop but extending to lower altitudes than the other calcicolous 'montane' species (viz. A. viride and Gymnocarpium robertianum), occurring for example on Mynydd Llangyndeyrn and at Crwbin; commonly growing on walls made of limestone blocks. A surprising site is on the parapet of the bridge over the Teifi at Cwmann, Lampeter (RDP & A. O. Chater, 1982). Clearly more tolerant of dessication than Asplenium viride and Gymnocarpium robertianum, it is also sometimes found on the calcarous bands of the Old Red Sandstone, on Coal Measures rocks in Cwm Twrch, and older rocks in the N of the county at sites such as Allt Rhyd-y-Groes, Rhuddallt and Ystradffin in the Rhandirmwyn district.

ASPIDIACEAE

Polystichum aculeatum (Hard Shield Fern). Not particularly common except at some sites such as on the Silurian and Devonian rocks of the Sawdde Gorge where there is ample exposure of base-rich rock, here it occurs gregariously and specimens reach good size. Another good site

for this species is Glyn Hir near Llandybie, otherwise it often occurs singly or in small groups at many upland, and a few lowland sites with a good calcareous content.

P. x bicknellii (P. aculeatum x P. setiferum, Lowland Hybrid Shield Fern). Known only from the ravine at Cwm Clydach near Cydweli (Kidwelly), where are found extensive populations of P. setiferum and a few plants of P. aculeatum. The hybrid is rare for the parents are usually separated ecologically. The morphology is intermediate in many ways between the parents.

P. setiferum (Soft Shield Fern). A much more lowland species than P. aculeatum, and much more commonly occurring especially in shady sites on suitable alluvial soils and in the ash-hazel woods on the lower parts of the Carboniferous Limestone outcrop. Where it occurs, P. setiferum often forms large populations (unlike the frequently near-solitary P. aculeatum); these populations often show very wide variability in frond morphology, but these variations eg. angle of pinnule insertion, cannot be correlated with any ecological criteria, they seem to be randomly inherited. P. setiferum normally grows in the forest floor soil rather than in rock crevices as is often the case with P. aculeatum. The distribution map clearly shows that the greatest density - even allowing for less recording in the inland areas - is near the coast where it even occurs on the afforested duneland of Pembrey, along the major river valleys, where base-enriched alluvium forms a suitable substrate and the on lower parts of the Carboniferous Limestone outcrop.

Dryopteris oreades (Mountain Male Fern). This fern of mountain scree has only been confirmed from one or two sites eg. Cwm Gwenffrwd near Rhandirmwyn. Further searching may prove its occurrence elsewhere.

D. filix-mas (Common Male Fern). Common in woods, hedgebanks and hillsides where the soil is not too acidic (when it is replaced by D. dilatata). The pH of the soil also controls its frequency, eg. it is far more common on the Old Red Sandstone than on the Coal Measures. A variable fern.

D. x tavelii (D. affinis x D. filix-mas, Hybrid Male Fern). There is an unsubstantiated field record from near Lampeter, but due to the great probability of its confusion with D. affinis subsp borreri var. 'robusta', all field records should be confirmed by microscopic examination of the spores. Nevertheless, this hybrid could well occur. Difficulty in identification is increased by the fact that this hybrid can exist as a pentaploid ("with toothing like D. filix-mas") and as a much rarer tetraploid ("like a lobed subsp. affinis" - C.R. Fraser-Jenkins, pers comm.)

D. affinis (Golden-scaled Male Fern). One of the problem plants of the Carms. flora!, for although the species itself is easy to recognize, the identification of subspecies can be very difficult, a situation worsened by lack of agreement between the authorities on this species. All three subspecies, ssp affinis, ssp borreri, and ssp stilluppensis (as defined by CRF-J) have been recorded in Carms. (specimens in NMW, det. by CRF-J), also what appears to be var. 'robusta' has been noted. It is hoped that all difficulties encountered with the taxonomy of this fern are soon rectified, so that recording of the various taxa can commence in earnest.

D. aemula (Hay-scented Buckler Fern). This distinctive and attractive winter-green fern has been recorded from only two sites: a small population at the Gold Mines at Dolaucothi and a much more viable population in the Amroth valley. Both sites are re-discoveries of old records, the Dolaucothi plants being first found by H.H. Knight in 1907, and re-found in 1982; whilst the Amroth population was first noted by T.W. Barker in 1906 and re-found in 1983. Both groups grow on damp acidic rock outcrops with a light cover of Quercus.
This 'Atlantic' species (ie. preferring damp, mild conditions) should be searched for elsewhere especially in acidic, coastal valley woodland; its winter-green habit should be an aid for initial location, (though D. dilatata is frequently winter-green in mild winters). D. aemula seems to be a rare plant, for seemingly suitable sites checked so far have not yielded any further colonies. However it is likely that it will turn up elsewhere.

D. carthusiana (Narrow Buckler Fern). Fairly widespread but not common, growing on acidic bogland and a few other marshy sites. A good-sized population exists at Talley (Talyllychau) between the two lakes, but other sites usually only hold a few plants. It grows under full sun or in the shade of marshland trees such as Salix or Alnus.

D. x deweveri (D. carthusiana x D. dilatata, Hybrid Narrow Buckler Fern). Known only from the D. carthusiana site at Talley, but again, a plant that could well occur elsewhere. It often grows on sites that are drying out (as at Talley) - an intermediate habitat between that of the parents.

D. dilatata (Broad Buckler Fern). A very common species in a wide variety of acidic situations, both wooded and open, dry or wet (eg. bogs), on scree and even (under humid conditions) epiphytic.

D. expansa (Northern Buckler Fern). Rare, recorded in the NE of the county, from two sites. Damp, shaded, montane large-block screes should be checked for this species.

BLECHNACEAE

Blechnum spicant (Hard Fern). Another common species on damp acid slopes and banks.

NATURALISED AND CASUAL SPECIES

Selaginella kraussiana (Mossy Clubmoss). Recorded only once on a gravelly nursery path (near Felinfoel, Llanelli) and surviving the winter. Now lost from this site, though cultivated portions of this plant still survive out-of-doors in the author's (IKM) garden.

Matteucia struthiopteris (Ostrich Fern). Introduced to, and surviving at a boggy area near the garden of the author at Stradey, Llanelli.

Adiantum capillus-veneris (Maidenhair Fern). Has occurred presumably as an 'escape' at Ferryside and near Laugharne, though occurs naturally on coastal cliffs in Pembs. and Glam. and may conceivably occur in Carms.

CONSERVATION: Collection of the rarer species or hybrids should be strictly avoided for all are sufficiently represented in NMW if serious botanists wish to see Carmarthenshire specimens.

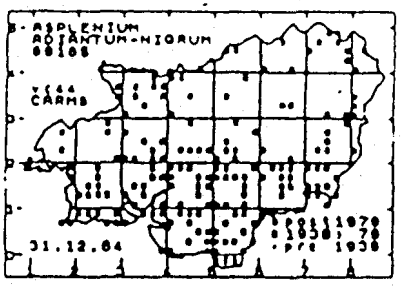
I should like to sincerely thank all recorders who have contributed pteridophyte records and especially R.D. Pryce for providing a wealth of data and advice regarding this article. He has also kindly produced the provisional distribution maps, here published for the first time. Gratitude is also due to Messrs P.M. Benoit, C.R. Fraser-Jenkins, S.G. Harrison and R.H. Roberts who have identified specimens and offered advice.

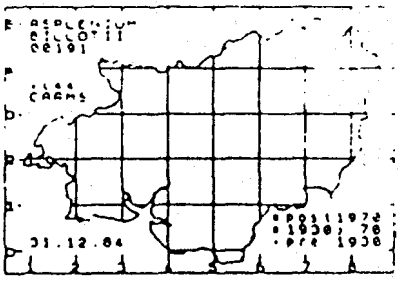
I.K.M.

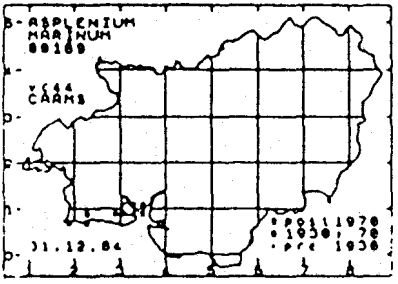
A Note on the Maps

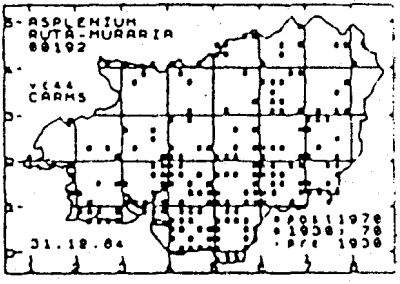
The appended distribution maps, based on 2km x 2km squares of the National Grid (tetrads), attempt to present the most up to date information available, based on data collected by recorders participating in the Carmarthenshire Flora Project, to whom grateful acknowledgement is made. The maps must therefore be regarded as very provisional but it is hoped that they will act as a stimulus to further recording and an encouragement to new recorders to join the project.

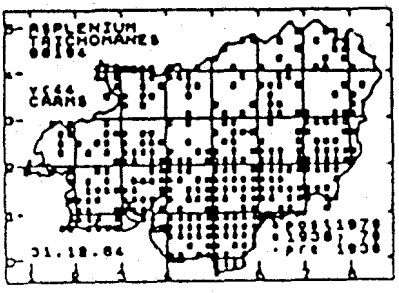
R.D.P.

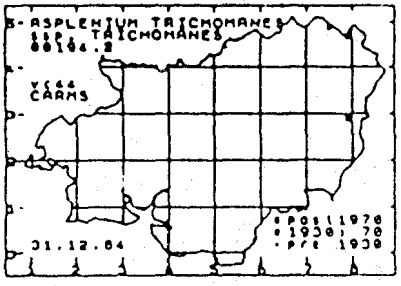

ASPLENIUM
ADIANTUM-NIGRUM
00188
1644
CARMS
31.12.84

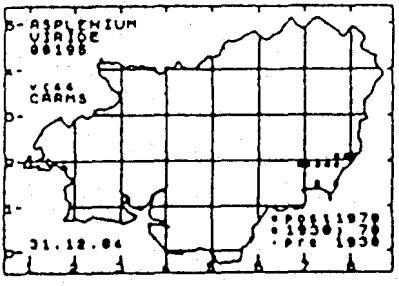

ASPLENIUM
00191
1644
CARMS
31.12.84

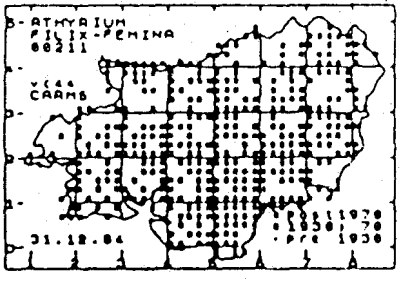

ASPLENIUM
MARINUM
00189
1644
CARMS
31.12.84

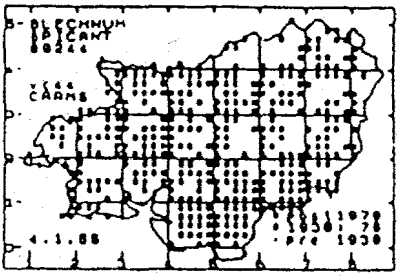

ASPLENIUM
RUTA-MURARIA
00192
1644
CARMS
31.12.84

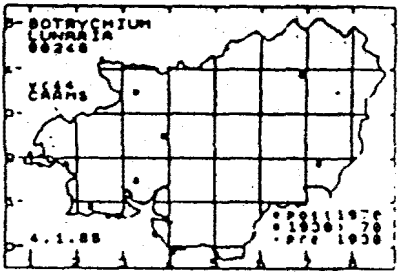

ASPLENIUM
TRICHOMANES
00194
1644
CARMS
31.12.84

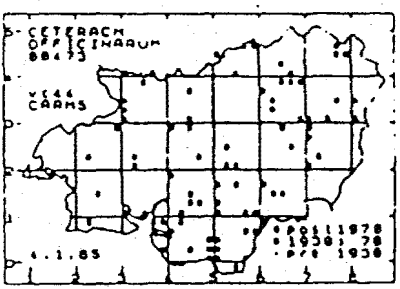

ASPLENIUM TRICHOMANES
TRICHOMANES
00194.2
1644
CARMS
31.12.84


ASPLENIUM
VIRIDE
00195
1644
CARMS
31.12.84

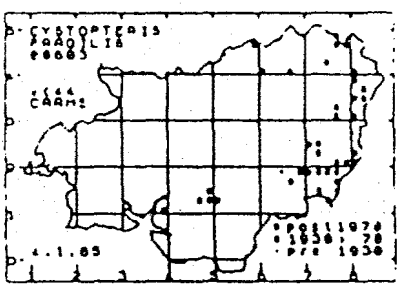

ATHYRIUM
FILIX-FEMINA
00211
1644
CARMS
31.12.84

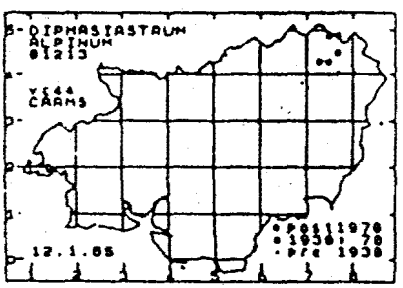

BLECHNUM
SPICANT
YEAR
CARMS
4.1.85

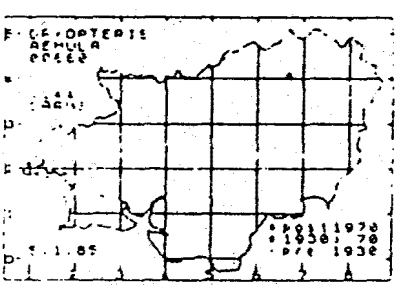

BOTRYCHIUM
LUNARIA
YEAR
CARMS
4.1.85

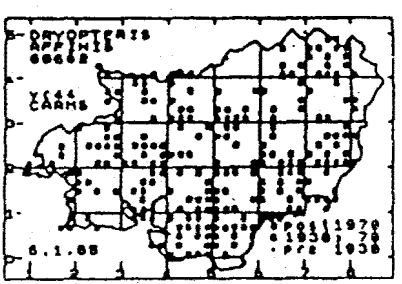

CETERACH
OFFICINARUM
YEAR
CARMS
4.1.85

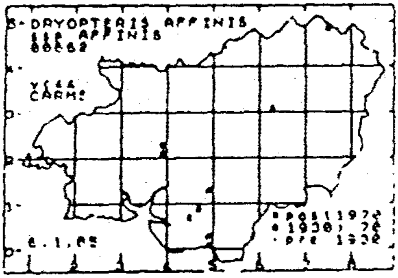

CRYPTOGRAMMA
CRISPA
YEAR
CARMS
4.1.84

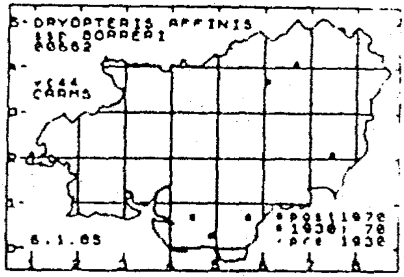

CYSTOPTERIS
FRAGILIS
YEAR
CARMS
4.1.85

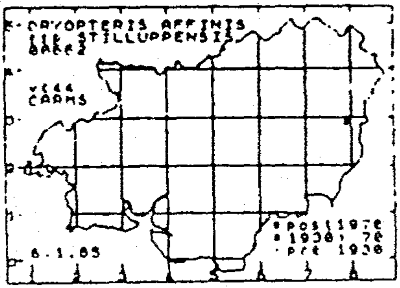

DIPHASIASTRUM
ALPINUM
YEAR
CARMS
12.1.85

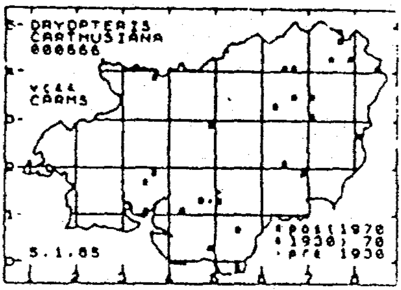

GYMNOCARPIUM
DRYOPTERIS
YEAR
CARMS

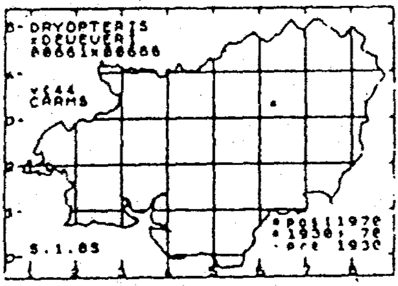

DRYOPTERIS
AFFINIS
YEAR
CARMS
6.1.85

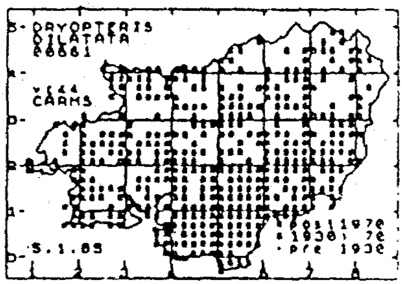

DRYOPTERIS AFFINIS
SSP AFFINIS
VC44
CARMS
POST 1970
1930) 70
PRE 1930

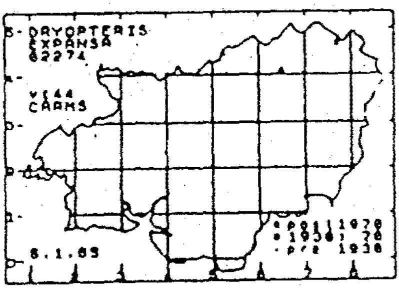

DRYOPTERIS AFFINIS
SSP BORRERI
VC44
CARMS
POST 1970
1930) 70
PRE 1930
8.1.85

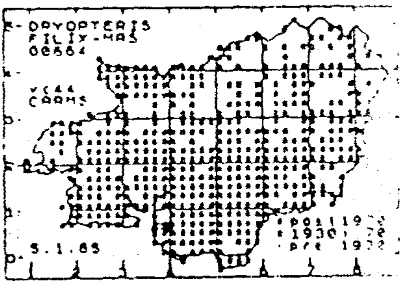

DRYOPTERIS AFFINIS
SSP STILLUPPENSIS
VC44
CARMS
POST 1970
1930) 70
PRE 1930
8.1.85

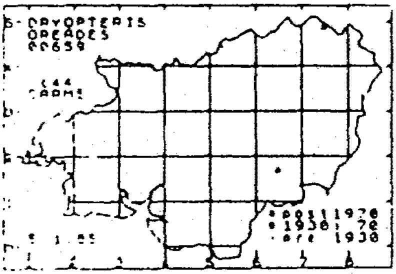

DRYOPTERIS
CARTHUSIANA
VC44
CARMS
POST 1970
1930) 70
PRE 1930
5.1.85

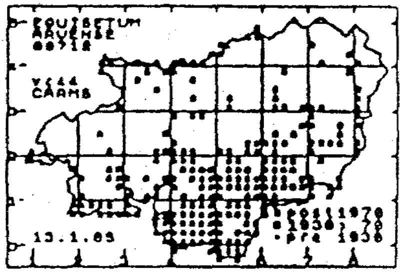

DRYOPTERIS
VC44
CARMS
POST 1970
1930) 70
PRE 1930
5.1.85

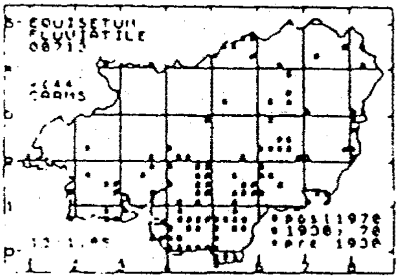

DRYOPTERIS
DILATATA
VC44
CARMS
POST 1970
1930) 70
PRE 1930
5.1.85

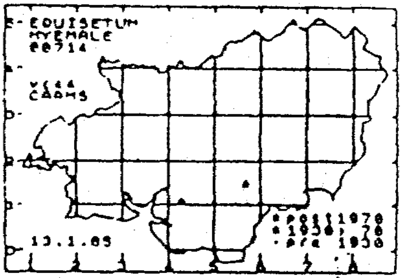

DRYOPTERIS
EXPANSA
VC44
CARMS
POST 1970
1930) 70
PRE 1930
8.1.85

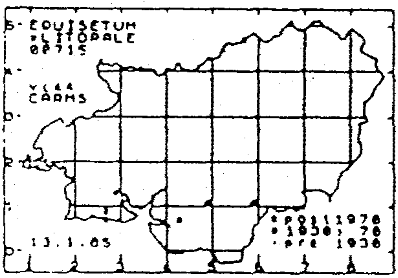

DRYOPTERIS
FILIX-MAS
VC44
CARMS
5.1.85

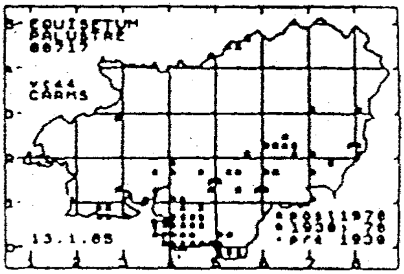

DRYOPTERIS
OREADES
00659
VC44
CARMS
pre 1930

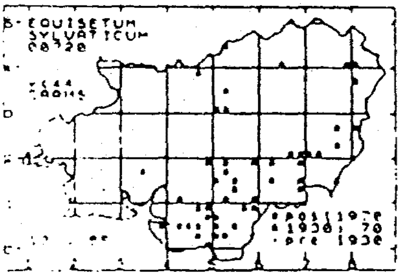

EQUISETUM
ARVENSE
VC44
CARMS
13.1.85
pre 1930

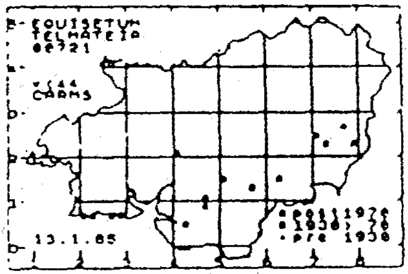

EQUISETUM
FLUVIATILE
VC44
CARMS
pre 1930

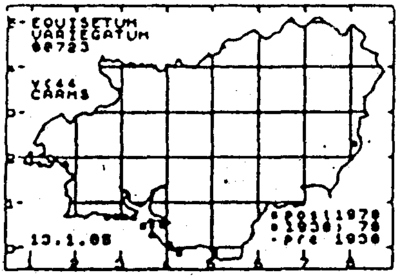

EQUISETUM
HYEMALE
00714
VC44
CARMS
13.1.85
pre 1930

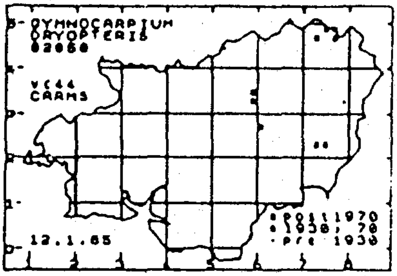

EQUISETUM
×LITORALE
00715
VC44
CARMS
13.1.85
pre 1930

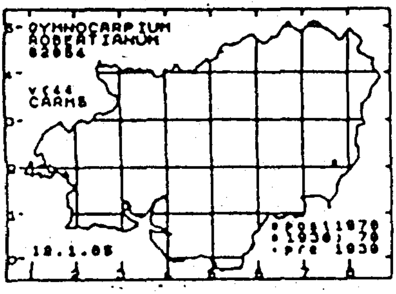

EQUISETUM
PALUSTRE
00717
VC44
CARMS
13.1.85
pre 1930

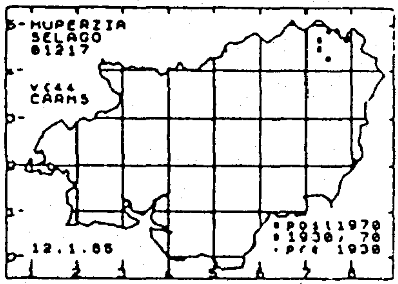

EQUISETUM
SYLVATICUM
00720
VC44
pre 1930

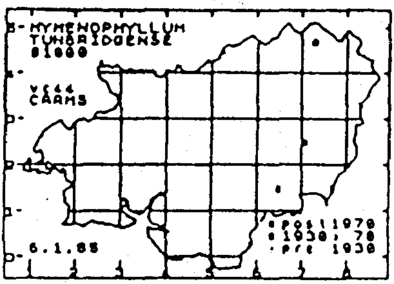

EQUISETUM
TELMATEIA
00721
VC44
CARMS
13.1.85
pre 1930

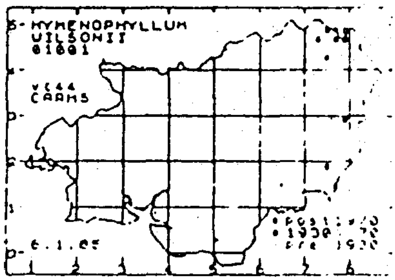

EQUISETUM
VARIEGATUM
VC44
CARMS
13.1.85
• POST 1970
• 1930-70
· pre 1930

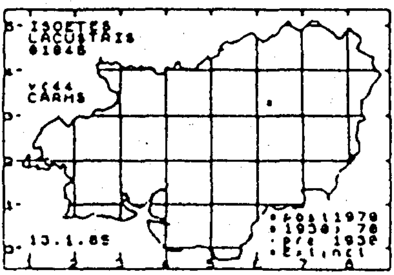

GYMNOCARPIUM
DRYOPTERIS
VC44
CARMS
12.1.85
• POST 1970
• 1930-70
· pre 1930

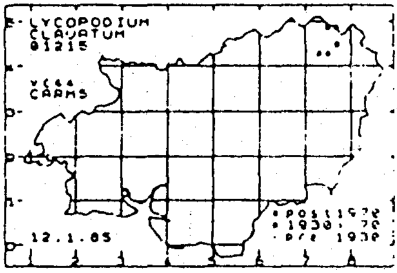

GYMNOCARPIUM
ROBERTIANUM
VC44
CARMS
12.1.85
• POST 1970
• 1930-70
· pre 1930

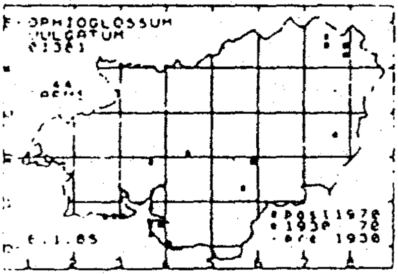

HUPERZIA
SELAGO
01217
VC44
CARMS
12.1.85
• POST 1970
• 1930-70
· pre 1930

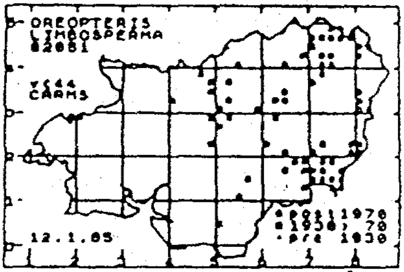

HYMENOPHYLLUM
TUNBRIDGENSE
VC44
CARMS
6.1.85
• POST 1970
• 1930-70
· pre 1930

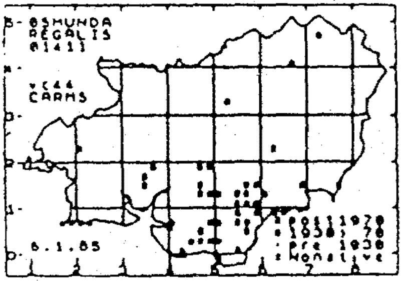

HYMENOPHYLLUM
WILSONII
VC44
CARMS

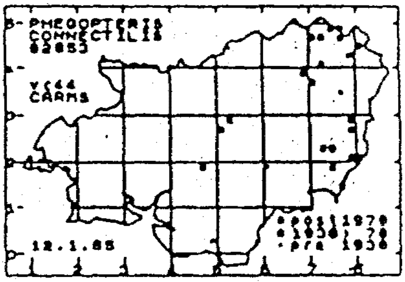

ISOETES
LACUSTRIS
VC44
CARMS
13.1.85
• POST 1970
• 1930-70
· pre 1930
• Extinct

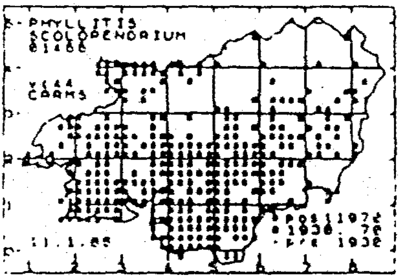

LYCOPODIUM
CLAVATUM
01215
VC44
CARMS
12.1.85

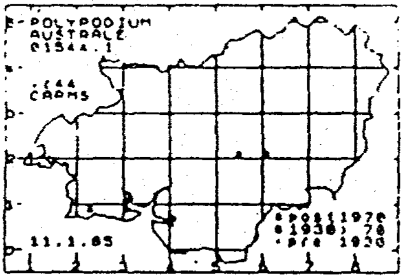

OPHIOGLOSSUM
VULGATUM
6.1.85
• post 1970
• 1930 - 70
· pre 1930

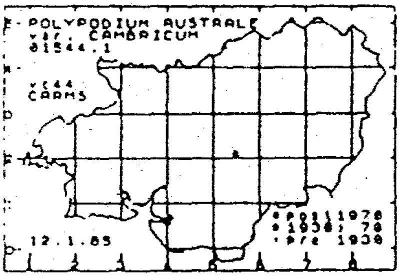

OREOPTERIS
LIMBOSPERMA
02081
VC44
CARMS
12.1.85
• post 1970
• 1930 - 70
· pre 1930

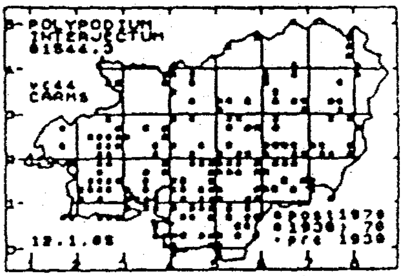

OSMUNDA
REGALIS
01411
VC44
CARMS
6.1.85
• post 1970
• 1930 - 70
· pre 1930
: Non alive

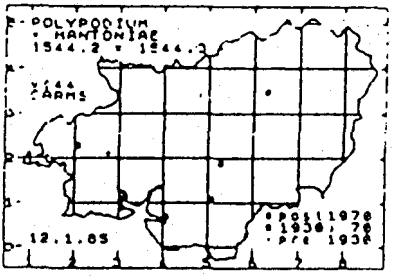

PHEGOPTERIS
CONNECTILIS
02053
VC44
CARMS
12.1.85
• post 1970
• 1930 - 70
· pre 1930

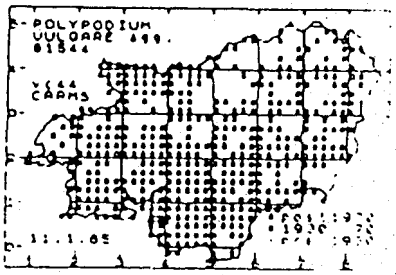

PHYLLITIS
SCOLOPENDRIUM
01466
VC44
CARMS
11.1.85
• post 1970
• 1930 - 70
· pre 1930

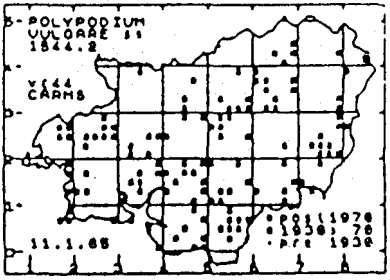

POLYPODIUM
AUSTRALE
01544.1
VC44
CARMS
11.1.85
• post 1970
• 1930 - 70
· pre 1930

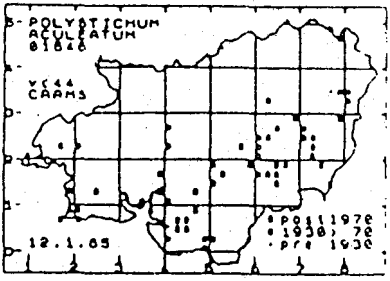

POLYPODIUM AUSTRALE
var. CAMBRICUM
01544.1
VC44
CARMS
12.1.85
• post 1970
• 1930 - 70
· pre 1930

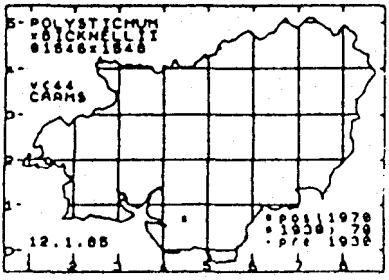

POLYPODIUM
INTERJECTUM
01544.3
VC44
CARMS
12.1.85
• post 1970
• 1930 - 70
· pre 1930

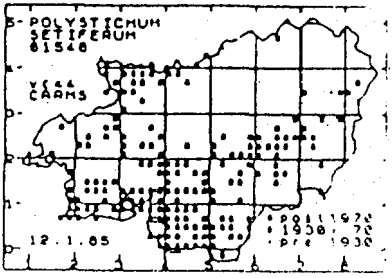

POLYPODIUM
MANTONIAE
1544.2 x 1544.3
YX44
CARMS
12.1.85

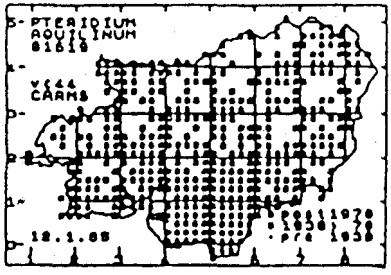

POLYPODIUM
VULGARE agg.
01544
YX44
CARMS
11.1.85

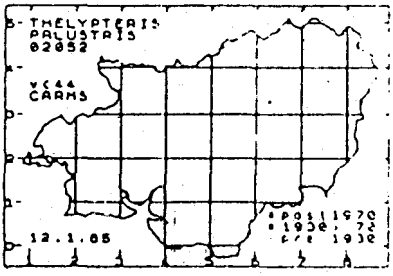

POLYPODIUM
VULGARE s1
1544.2
YX44
CARMS
11.1.85


POLYSTICHUM
ACULEATUM
01546
YX44
CARMS
12.1.85


POLYSTICHUM
x BICKNELLII
01546x1548
YX44
CARMS
12.1.85


POLYSTICHUM
SETIFERUM
01548
YX44
CARMS
12.1.85


PTERIDIUM
AQUILINUM
01819
YX44
CARMS
12.1.85


THELYPTERIS
PALUSTRIS
02052
YX44
CARMS
12.1.85

REFERENCES

BENOIT, P.M. (1964). The two types of Asplenium trichomanes. Nature in Wales, 9: 75-9.

BENOIT, P.M. (1966). Some recent work in Wales on the Polypodium vulgare aggregate. Brit. Fern Gazette, 9(7): 277-82.

FRASER-JENKINS, C.R. (1980). Dryopteris affinis: a new treatment for a complex species in the European Pteridophyte flora. Willdenowia, 10.

FRASER-JENKINS, C.R. (1982). Dryopteris in Spain, Portugal and Macaronesia. Bol. Soc. Broteriana, ser 55: 175-336 and 296-301.

HYDE, H.A., Wade, A.E. & Harrison, S.G. (1978). Welsh Ferns, Clubmosses, Quillworks and Horsetails, 6th edn. Cardiff.

JERMY, A.C. (1984). The Scaly Male Fern - Problem Fern Number One. Pteridologist, 1: (1984).

MAY, R.F. (1967). A List of the Flowering Plants and Ferns of Carmarthenshire. Haverfordwest (1967).

PAGE, C.N. (1982). The Ferns of Britain and Ireland. Cambridge.

SCHNELLER, J.J. (1974). Untersuchungen ar einheimischen Farnen, insbegondere der Dryopteris filix-mas-Gruppe. Ber. Schweiz. Bot. Ges., 84(3): 195-217. (also giving useful illustrations of pinnules of D. filix-mas, D. affinis and D. x tavelii).

THE PROBLEMS OF ASSESSING THE RELATIVE POPULATIONS OF ZOSTERA (EELGRASS) SPECIES IN THE SEVERN ESTUARY, v.c. 35.

T.G. Evans

Prof. T.G. Tutin recognises all three species of Zostera : Zostera marina L.; Z. angustifolia (Hornem.) Reichenb. & Z. noltii Hornem. in specimens collected from the Severn Estuary.

My first encounter with eelgrass in the Severn Estuary was over thirty years ago, when my chief interest was ornithology. It was dismissed as one of the intertidal algae. It was not until 1972 that I had a closer look and tentatively identified Zostera angustifolia and had it confirmed by Prof. Tutin. Of the plants examined then, none had leaves that exceeded 5mm in width and most of the widest leaves averaged under 4mm, which in my ignorance, excluded Z. marina, which was quoted to have leaves 5-10mm wide. Other features discernible in the field complicated identification.

My early 'Bible', "Handbook of the British Flora" by Bentham & Hooker, recognised only two species, Z. marina and Z. nana (= Z. noltii); Butcher's "Illustrated Flora" confined itself to the same two species and having spent some time this Autumn trying to sort out the three species I would be quite happy to return to that position.

The problem in the estuary is its nature. Firstly, the tidal range is second only to that in the Bay of Fundy, averaging 12.4m at Beachley for Spring Tides but rising to 15.9m in extreme cases; secondly, the shape causes surges, the largest of which form the "Severn Bores"; thirdly, the orientation of the estuary, with its opening to the SW, makes it subject to the full force of the SW gales; fourthly, the large amount of granular material carried by the Rivers Severn, Wye, Usk etc. is deposited, lifted, carried and deposited repeatedly. These factors cause great disturbance to the bed of the estuary.

The eelgrass has to survive in this unfriendly habitat. Most is to be found in an intertidal area of mud, gravels, sand and peat off the Gwent (Monmouthshire) shore between Sudbrook and Redwick. The region is at least 8km long by 4km wide. From the saltmarsh, soft and sticky, mud has to be negotiated to reach the firmer peat or gravels, which may be covered with layers of mud. The obstacle of the first soft mud has probably been responsible for the omission of mention of eelgrass from the floras of Hamilton, Shoolbred and Wade. The gravel that lies over mud is comfortable to walk on as it gives beneath the feet; over peat it is firm. In places the gravel is mixed with mud, in others it forms clean ridges. At low tide there are several shallow lakes and the area drains slowly by means of winding channels, which are the first to fill when the tide turns. It needs much experience to wend your way over this large expanse and many imprudent explorers have been cut off and drowned there. Even the experienced has to remain alert as new ridges, channels or lakes can be formed from week to week, particularly after storms. Nevertheless, the eelgrass shares this region with sea lettuce, various wracks and other algae, billions of invertebrates upon which feed the 100,000 plus wading birds and ducks that overwinter there.

As Prof. Tutin has stated in letters to me, these are not optimum conditions for Zostera species and the result is to concertina the size characteristics, so that it is not easy to distinguish Z. angustifolia from Z. marina or from, particularly in non-flowering stems, Z. noltii. Flowering stems of Z. noltii are easiest to separate because of the regularly spaced flaps (retinaculae) in its inflorescence. The larger specimens of Z. marina cause little problem as they have large rhizomes and leaves wider than 4mm. They are usually found in the lakes and channels, though muddy areas with the tips of leaves poking through one week may be a lake full of eelgrass a week later. Z. noltii tends to

prefer slightly raised zones. However, all three occur mixed up in a most random fashion over large parts of the intertidal region and the characteristics intergrade confusingly. The plants are not easy to separate either and it is not possible to be certain which part belongs to which plant.

The features that cause the most trouble are as follows:-

1. Leaf width due to reduction of that in Z. marina.
2. Inflorescence lengths as below:-
   Z. noltii average below 2cm but range widely (cf. NCC figures 3-6cm)
   Z. angustifolia average 2.5cm with a bigger variation (cf. NCC 8-11cm)
   Z. marina average 5cm with an even bigger variation though nothing above 7.5cm. (NCC 9-12cm)
3. All stigmas and styles apart from Z. noltii are approximately equal.
4. Apart from the larger specimens of Z. marina, the rhizomes gradate from that of Z. noltii depending on the covering of mud. Do older well buried rhizomes give rise to younger and less thick ones?
5. Some Z. marina leaf tips are emarginate probably due to the lashing they get from the turbulent tides and their gritty loads.
6. Seeds taken out of the same inflorescence have shown both smooth and ribbed surfaces.

Any tips to smooth identification will be thankfully received.

CANARY IVY IN WALES?

Miss A. Rutherford

There may be four species of ivy in Wales; Hedera helix, Common, H. hibernica, Atlantic, including the commonly-planted cultivar 'Hibernica', 'Irish' ivy, and the Persian, H. colchica, for there is a specimen in the Herbarium of the National Museum of Wales, labelled 'Hedera canariensis'. Unfortunately it was gathered at the fertile (flowering) stage, when it is difficult or impossible to determine the species. This ivy was found in Merioneth, at 'the glen' Penmaen Pool. There are three possible 'hollows' that might answer in the wooded area about 2 miles SW of Dolgellau.

True Canary ivy, no longer in commerce, has been re-introduced to a few collections after about 100 years. Not reliably hardy, it could have succumbed to the winter of 1947 or '82, though Penmaen Pool is probably milder than the Ness peninsula or Germany, the only places it has been planted-out recently.

H. canariensis is quite unlike the plant for sale under that name today (properly H. algeriensis). Canary ivy colours little in cold, has matt, grey-green, flat leathery leaves, is slow-growing and shy to flower. The foliage of the pressed specimen resembles that of H. affine algeriensis 'Argyle Street', a rare ivy of very old plantings. It can be any shade of green from light bright to rich emerald, seldom bronzing in winter. At the fertile stage of development, the leaves are almost circular and look like those of Griselinia, but at the creeping-climbing stage are three-lobed and slightly puckered by being raised between the veins.

I would be very glad to have living juvenile sprays of any strange-looking Hedera from the Penmaen Pool area and will refund postage. To get really young material from mature plants may mean collecting from the base, right on the ground or just above, supple whippy shoots are required, as more advanced branches are not typical, root less readily and have fewer scale-hairs, an important diagnostic feature. I would rather they were too damp than too dry, as ivies if wizzened cannot be revived, but even if the leaves have turned black and rotten, the stem will root.

Address for specimens: Moniaive, 19 South King Street, Helensburgh, Dunbartonshire G84 PU7

LETTERS TO THE EDITOR

Re-reading through the February 1983 number of the Bulletin I noted the article by Mr. T.G. Evans on the late flowering of Campanula patula.

On Christmas Day this year it was still in flower in my garden. I am in Herefordshire but only 1½ miles from the Radnorshire-Welsh border. In Radnorshire it is not common, occurring mainly along the county boundary with Hereford, where there are several records though it is decreasing.

My plants came from seed collected in Herefordshire when the Council were widening a road in the Golden Valley and C. patula appeared in

quantity on the disturbed soil bank. Later this was to be moved again, and the Council suggested that plants be collected and replanted after the work finished. This was tried, but the late Recorder for Hereford and myself also collected seed, grew plants and replanted seedlings, since when they have continued to flourish.

I kept two plants in my garden and now find it coming up all over the place, though it prefers gravel paths.

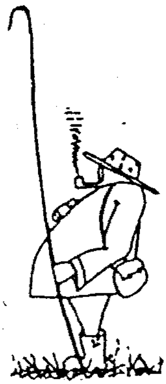
As a child I remember it along hedgerows in Herefordshire and Mr Sinker once suggested to me that in former days when roadmen dug out ditches and removed soil to hedge banks, C. patula liked this disturbed soil, which is possible, as the seed is extremely small. Seedlings appear to take two years to mature and flower, and then die.

On Christmas Day I listed the following plants in flower in the garden: Lamium purpureum (Purple dead-nettle), Geranium robertianum (Herb Robert), Primula veris (Cowslip - 2 plants), P. vulgaris (Primrose), Viola odorata (White and purple violets), Ranunculus repens (Creeping buttercup), Tanacetum parthenium (Feverfew), and of course Senecio vulgaris (Groundsel) and Bellis perenis (Daisy).

Along the roadside verge and hedgebank below the garden were: Sonchus oleraceus (Common sow-thistle), Silene dioica (Red campion), Capsella bursa-pastoris (Shepherd's purse), Lamium album (White dead-nettle), Achillea millefolium (Yarrow) and Taraxacum (Dandelion). Garden plants still flowering were: Stocks, Tobacco, Pansy, Nasturtium, Marigold, Pinks, Roses, Primula, Polyanthus, Aubretia, Candytuft, Alyssum saxatile, Omphalodes cappadocica, Campanula portenschlagiana, Cheiranthus - Orange wallflower, Meconopsis cambrica. Flowering but spoilt by rain: Schizostylis, Viburnum, Prunus subhirtella autumnalis and one Gentiana acaulis which has refused to flower in twelve years!

Since then severe frosts and snow have obliterated most, but Hamamelis mollis and Lonicera fragrantissima are covered in flowers and scenting the air.

From Miss A.C. Powell, Recorder VC 43



Equisetum fluviatile var. *giganteum*