

# *The Flora of Staffordshire, 2011.*

## Update No. 3 (January, 2013).

### 1. Corrigenda.

Page

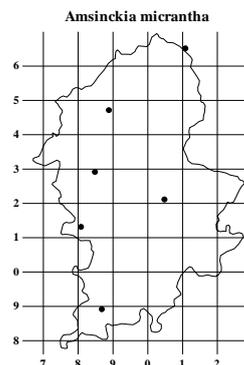
255 *Ceanothus divergens*: delete “2005” at end of the section and replace by “CBW”.

### 2. Additional Records of Less Common Species for the period 1995-2011.

Page

118	<i>Pseudotsuga menziesii</i>	SJ8115
122	X <i>Cupressocyparis leylandii</i>	SJ81B
137	<i>Platanus x hispanica</i>	SJ81B; SO99H
186	<i>Diplotaxis tenuifolia</i>	SO99H
193	<i>Primula x polyantha</i>	SJ8014
216	<i>Potentilla recta</i>	SO9395
216	<i>Potentilla x mixta</i>	SJ8014
224	<i>Prunus cerasifera</i>	SJ81B; SO99H
235	<i>Vicia villosa</i>	Waste ground, Lanesfield, SO9395, PN, 2011
257	<i>Aesculus carnea</i>	SJ81B
279	<i>Phacelia tanacetifolia</i>	SJ8013
282	<i>Amsinckia micrantha</i> †	Profuse over several arable fields, Brineton, SJ8013, PN, 2011
283	<i>Myosotis ramosissima</i>	SJ81B
318	<i>Centaurea scabiosa</i>	SO99H
320	<i>Cichorium intybus</i>	SJ8013
368	<i>Briza maxima</i>	SO9395
399	<i>Ophrys apifera</i>	SO9395

†There are now six records for this species. Consequently, a distribution map is provided:



### 3. Staffordshire Flora: Some Notes on Declines, Losses and Gains.

[More details pertaining to individual taxa can be found in their species accounts in the *Flora*.]

#### A. Major Frequency Changes

When comparing accounts of plant distribution across the centuries, it has to be borne in mind that Edees (in *Flora of Staffordshire*, 1972) produced what was the first detailed Flora across the whole county: previous workers pose some problems. Gisborne (in the early 1790s) was most familiar with the Needwood Forest area; Dickenson (*A Catalogue of Plants ascertained to be indigenous in the County of Stafford*, 1798) his parish in western lowland Staffordshire. Although Garner seems to have walked everywhere, his 1844 *The Natural History of the County of Stafford* was published when he was still quite a young man and was never revised, and his accounts are frequently terse, with a very few seeming to be in error or misleading. Fraser (*Plants found in Staffordshire*, 1864) and Bagnall (*The Flora of Staffordshire*, 1901) knew south Staffordshire best, and for the north of the county the latter largely reproduces Garner's records. The excellent Reader (*The flora of Hawkesyard*, 1923 & 1926) concentrated on the area about Rugeley and Cannock Chase, whilst Ridge's *Flora* (1922-1929) focused on North Staffordshire. Even Edees had apparent blind spots: he seems to have under-recorded several aquatic species and possibly some woodland taxa.

#### Arable Weeds

According to the information we have for past years, Staffordshire has never been rich in arable weeds, with only a handful of records, ever, for *Kickxia elatine*, *K. spuria*, *Legousia hybrida*, *Torilis arvensis* and *T. nodosa*.

R. Garner (*The Natural History of the County of Stafford*, 1844) wrote of *Chrysanthemum segetum*, *Lepidium campestre*, *Lithospermum arvense*, *Mentha arvensis* and *Silene gallica* (as "*S. anglica*") being "common" in cornfields, with *Ranunculus arvensis* as "general" there.

J.E. Bagnall (*The Flora of Staffordshire*, 1901) was still encountering *Lepidium campestre* and *Lithospermum officinale*, but only gave a few sites for the others, together with *Agrostemma githago*. The last of these was not mentioned in Garner's account; nor were *Scandix* and *Euphorbia exigua*, which Bagnall regarded as common.

By the time of W.T.B. Ridge (*The Flora of North Staffordshire*, 1922) all of the species mentioned in the last two paragraphs were still present, but all were in the decline that has continued to the present day. The last record for *Torilis arvensis* was c. 1880, *T. nodosa* was in 1930, *Kickxia spuria* pre-1950, *Scandix* in 1951. *Silene gallica* has not been seen since 1954, *Legousia* since the nineteen-eighties and *Kickxia elatine* 1999. *Lepidium campestre* is now only found by waysides, railways and disturbed ground.

Some of the few "rare" weed records that we do have were from a different habitat: the Burton brewery waste, in the 1920s, 1930s and 1940s.

*Alopecurus myosuroides* (as *A. agrestis*) was known in cultivated fields ("abundant about Stone and Stafford") from 1791, but appears to have been largely eliminated by the end of the 19<sup>th</sup> Century. It has, however, increased in cornfields, sometimes in appreciable patches, at a slowly accelerating rate since about 1997. *Anisantha diandrus*, *Bromus secalinus* and *B. commutatus* are other grass species that can now be found in similar places (albeit in smaller quantities than the previous weed): the first was a new arrival in 1988; the others reappearing after an absence going back to 1930.

Amongst other "gains" is *Solanum nigrum*, first recorded in 1817. It was regarded as "uncommon, except perhaps near Burton and Tamworth", by E.S. Edees (*Flora of Staffordshire*,

1972), but became much more frequent in subsequent years. Interestingly, to date, most early sites for the related *S. physalifolium*, first reported in 1999, are in the vicinity of these two conurbations.

### Sandy & Open Ground

In 1844, *Teesdalia nudicaulis* was “generally in sandy places”; *Cynoglossum officinale* “common on coal-pit-lows”; *Scleranthus annuus* on “sandy soil, general”; *Gnaphalium sylvaticum* “common in gravelly places”. The 1901 publication queried the “general” attribute of *Scleranthus* and simply gave lists of sites for the others: a dozen in the case of *Teesdalia*; rather fewer for the others. Ridge found *Scleranthus annuus* “occasionally in fields or on waste ground”, but knew little of the others.

### Wetlands

Increased levels of drainage have had a detrimental effect on the flora in Staffordshire just as they have nationwide. However, only one taxon that was ever said to be common in such situations is now extinct. This exception is *Eleocharis multicaulis*, but only in as far as Garner (1844) wrote “*Eleocharis palustris* - *multicaulis* - *caespitosa* - *acicularis*. Common”. However, his records for *Carex* suggest that he had a weakness regarding the *Cyperaceae* and it seems likely that he did not examine the group sufficiently critically. Bagnall said, for *E. multicaulis*, that “I have not seen this in the county” and, in researching for the recent *Flora*, only two old records could be traced.

Some wetland species were much more frequent in the past than they are now. Garner gave *Utricularia vulgaris* as “frequent in pools”; *Drosera rotundifolia* “common and general in bogs”; *Lythrum portula* (as *Peplis portula*) “common in wet places”; *Narthecium ossifragrum* “common in bogs”; *Triglochin palustre* “common in wet places”; *Vaccinium oxycoccos* “common in all our bogs”; and *Hypericum elodes* “in all our bogs and mosses”. In our analysis of this evidence it is important to appreciate that Garner would have also been influenced in his thinking by the several boggy places that then existed in adjacent parts of Cheshire, which he seems to have also visited.

In 1901, Bagnall still quoted Garner’s assessments of the frequencies for the *Lythrum*, but added a “?” after those for the *Triglochin* and *Hypericum*. For the others, he merely gave short lists of sites. There was certainly some decline by Ridge’s 1922 accounts: “although” *Drosera rotundifolia* “occurs in many places I should hardly term it common now”; “I have not found” *Lythrum portula* “often”; *Triglochin palustre* “is not” common “now”; “if true that *Hypericum elodes*” was in all those sites, then, “it is not so now”. *Narthecium* was, by then, “frequent in bogs”.

Since the 1950s, it has become increasingly likely to find the newcomer *Bidens frondosa* on canal sides, rather than the native *B. cernua* or *B. tripartita*. Accompanying this trend has been a loss of *Potamogeton* spp. resulting from increasing barge traffic. The flora of pools has suffered a drastic modification with the arrival of a number of aliens. *Elodea nuttallii* has steadily increased since its first discovery in 1982. Although often forming dense patches, these lie just under the surface and it is not then the apparent pest that is the case with the aquarists’ throw-out *Crassula helmsii*, which arrived more than a decade earlier. Similar problems have occurred from 1990 onwards, with the water surface becoming densely covered by *Myriophyllum aquaticum*, *Lemna minuta* or *Hydrocotyle ranunculoides* at some sites.

### Heaths & Moors

*Vaccinium vitis-idaea* was “common” in 1844; in 1901 this term was not used, with a list of a dozen sites given instead; it was “fairly common” in 1922. All three of the earlier commentators wrote of *Pedicularis sylvatica* as being “common”, but Edees (1972) downgraded to the term “frequent”.

### Damp, Basic Grassland

There were massive losses of unimproved grassland throughout Britain during the mid- and late-twentieth century, but there had been a decline in both species richness and abundance prior to that. *Gentianella amarella* was, in 1844, “common in all hilly pastures” and *G. campestris*

“frequent with it”; *Parnassia palustris* was “frequent” in some districts. Bagnall gave only a few sites for Grass of Parnassus, but concurred with the other observations. Ridge’s assessments were that *G. amarella* “was not so common now” and that it was “not my experience” that *G. campestris* was frequent.

### The North-eastern Limestone

Significant native calcicoles are now much reduced in both the number of taxa still present and their frequency. Various changes in farming practices have played a major part in this change. There is now a different ratio of sheep- versus cattle- or pony-grazing, with a current problem of appreciable over-grazing of lower slopes by sheep. Animals are now kept out on these areas during autumn and winter with supplementary feeding. Additionally, Gorse is not cut or burned-off to the same extent and there has been a decline in coppicing of woodland. Farming subsidies have been paid, at some points, simply based on the area of land owned, resulting in less pressure to graze the steepest parts, which have become abandoned to scrub or woodland. Some areas of what is now woodland were obviously once loose scree, only a few decades ago.

In 1844, Garner wrote that *Melica nutans* was “abundant on broken limestone, in bushy spots, in the valleys of the Hamps and Manyfold”, a statement accepted, without comment by both Bagnall and Ridge. However, in Edees’ 1972 *Flora* it was given as rare and there have been no records since 1968. This area has rather few places, now, that could be reasonably be considered as “broken limestone” and the extent of woodland, there, has certainly expanded in recent decades, with an associated ground flora dominated by *Allium ursinum* and *Mercurialis perennis*.

Garner mentions a visit that he and a couple of friends made to Dovedale and the Manifold Valley when newly qualified doctors (probably in the early 1830s) in his *Holiday Excursions of a Naturalist* (1867): with “acres of Lily-of-the-Valley”. *Convallaria* is no longer seen in the limestone woodland (if that was its habitat, rather than the now almost non-existent open scree) from where it was known in the three post-war decades.

Again, Garner (1844) cited *Geranium columbinum* as “common, particularly on limestone rocks”; *Clinopodium acinos* (as *Acinos vulgaris*) “common on limestone, and in sandy fields in the south of the county”; *Draba muralis* “on every limestone rock”; *Arabis hirsuta* “on limestone, everywhere”; *Vicia sylvatica* “most abundant on the limestone, where it colours the hillsides by the profusion of its beautiful blossoms”, *Carlina vulgaris* “abundant on limestone”; *Sedum telephium* “very common and ornamental on limestone rocks and ruins.”

Bagnall supported the above assessments for *Carlina* and the renamed *Calamintha arvensis*; queried those for the *Arabis* and *Geranium*; and merely gave short lists of sites for the others. On the other hand, Ridge re-instated Garner’s comments regarding *Geranium columbinum* and considered that *Draba muralis* and *Sedum telephium* were “common on limestone”. He gave *Arabis hirsuta* as “frequent on limestone in Dovedale, the Manyfold Valley and Tutbuy”, but only a few locations for *Carlina vulgaris*, *Vicia sylvatica* and the further renamed *Calamintha acinos*.

### Rough Pasture

*Genista tinctoria* was “common and general” and *Ophioglossum vulgatum* “common in hilly pastures” in Garner’s day, but Bagnall only knew of a few sites for each. If the assessment of earlier botanists was correct, the decline in *Orchis morio* has been even more marked, Garner regarding it, too as being “common”, but Bagnall only giving a few localities.

### Open Woods

As described in Chapter 4 of the 2011 *Flora*, the composition and management of woodland has altered very significantly over many years and it is not surprising that habitats have been disturbed or changed, with a reduction or loss of the flora of earlier centuries. In *The Natural History of the County of Stafford*, *Serratula tinctoria* was “common in woods”; *Euonymus europaeus* “occasional. Plentiful in Dovedale and Wetton valley, and other places”; *Paris quadrifolia* “common in our retired woods”; *Ranunculus auricomus* “common in dry bushy

places". 57 years later, Bagnall queried the first of these statements and gave but short lists of sites for the other species. Following the passage of two more decades, Ridge "met with" *Serratula* "only occasionally." During his fieldwork (1930-1970), Edees found *Euonymus* to be "rare".

### Waysides and Waste Ground

Human activity has led to the creation of more and more transport routes and resulted in a huge number of other sites available for plant colonisation, following disturbance and neglect in urban areas. Seed or other propagules may be spread directly by this activity and the newly open areas can provide habitats for wind-blown seeds. A number of orchid species e.g. *Anacamptis pyramidalis*, *Ophrys apifera* and *Dactylorhiza praetermissa* seem to have spread in such places. *Fallopia japonica*, *Heracleum mantegazzianum* s.l. and *Buddleja davidii*, previously only known from gardens, were first found on disturbed sites in the nineteen-twenties, -sixties and -seventies respectively.

There is no evidence of any taxon showing a significant decrease in such places, but the list of incomers is appreciable, many of them still showing an increase of frequency, with some (such as *Conyza sumatrensis*, *Echinochloa crus-galli*, *Lactuca serriola*, *L. virosa* and *Senecio inaequidens*) steadily moving northwards. The expansion of the range of a number of species formerly considered to be more or less confined to the south-east of England (that is mentioned in many recently published county floras) has perhaps been most marked with regard to taxa that favour such disturbed habitats.

The salt tolerant *Cochlearia danica*, *Spergularia marina*, *Puccinellia distans* and, most recently, *Atriplex littoralis* have increasingly changed the floristic character of roadsides.

A full account of these habitats can be found on pages 64 to 72 of the recent *Flora*.

### B. Significant Losses

Unless mentioned earlier in this discourse, each of the species listed was only ever rare in Staffordshire. Dates are those of the last records of these natives and archaeophytes.

<i>Hammarbya paludosa</i>	late 18 <sup>th</sup> Century	Norton Bog
<i>Draba incana</i>	early 19 <sup>th</sup> Century	Limestone
<i>Antennaria dioica</i>	1844	Limestone grassland
<i>Huperzia selago</i>	1844	Heaths & moorland
<i>Lycopodiella inundata</i>	1844	Heaths
<i>Radiola linoides</i>	1844	Heaths
<i>Dianthus armeria</i>	c. 1845	Unimproved grassland
<i>Damasonium alisma</i>	1860	Pond
<i>Myriophyllum verticillatum</i>	1864	Pools
<i>Torilis arvensis</i>	c. 1880	Arable and waste ground
<i>Dryopteris cristata</i>	c. 1885	Acid fen
<i>Ranunculus baudotii</i>	1890	Brackish pools
<i>Arabis glabra</i>	late 19 <sup>th</sup> Century	Roadsides and hedgebanks on sandstone
<i>Oenanthe fluviatilis</i>	1892	River Trent
<i>Asplenium viride</i>	1894	Crevices on limestone
<i>Sparganium natans</i>	1896	Ditches and pools
<i>Chamaemelum nobile</i>	late 19 <sup>th</sup> Century	Commons, roadsides and lawns
<i>Eriophorum latifolium</i>	late 19 <sup>th</sup> Century	Base-rich mires and wet meadows
<i>Lolium temulentum</i>	late 19 <sup>th</sup> Century	Cornfield and clover weed
<i>Petroselinum segetum</i>	1901	Cornfields
<i>Sagina subulata</i>	1901	Sandy and open areas
<i>Campanula patula</i>	c. 1901	Hedgebanks and woods
<i>Alyssum alyssoides</i>	1903	Arable fields

<i>Orchis ustulata</i>	c. 1909	Calcareous grassland
<i>Eleocharis multicaulis</i>	1910	Marshes
<i>Elatine hydropiper</i>	c. 1923	Muddy pool margins
<i>Huperzia selago</i>	1926	Heaths and moorland
<i>Torilis nodosa</i>	1930	Arable and open ground
<i>Hymenophyllum tunbrigense</i>	1930s	A humid rock-face
<i>Ophrys insectifera</i>	1946	Limestone
<i>Minuartia hybrida</i>	1947	Limestone grassland
<i>Valerianella dentata</i>	1948	Arable fields
<i>Scandix pecten-veneris</i>	1951	Cornfields
<i>Erodium maritimum</i>	1954	Bare, sandy places
<i>Silene gallica</i>	1954	Sandy and open areas
<i>Utricularia vulgaris s. l.</i>	1955	Pools in the mosses
<i>Carex diandra</i>	1959	Pool margins, fens and swamps
<i>Polygonatum odoratum</i>	early 1960s	Limestone rocks
<i>Blasmus compressus</i>	1962	Base-rich flushes and fens
<i>Carex dioica</i>	1969	Base-rich flushes and valley mires
<i>Drosera anglica</i>	1970	Valley mire
<i>Daphne mezereum</i>	1972	Limestone scrub and woodland
<i>Cuscuta epithymum</i>	1974	Heathland
<i>Rosa micrantha</i>	1977	Scrub
<i>Genista anglica</i>	1980s	Moist heaths
<i>Potamogeton praelongus</i>	1982	Rivers, canals and a pond
<i>Moenchia erecta</i>	1983	Short grassland, heaths and sandy places
<i>Teesdalia nudicaulis</i>	1983	Sandy heaths
<i>Baldellia ranunculoides</i>	c. 1985	Flooded marl-pits, pools, ditches and marshes
<i>Melica nutans</i>	1986	Limestone scrub and woodland
<i>Legousia hybrida</i>	1987	Arable fields
<i>Epipactis palustris</i>	1989	Damp pasture
<i>Rumex longifolius</i>	1989	Waysides
<i>Pilularia globulifera</i>	1990	Muddy shorelines
<i>Herniaria hirsuta</i>	1991	Waste ground and railway sidings

### C. Notable Gains

Dates are those of first records. Hybrids are excluded, as are casuals and all but the most established garden escapes or throw-outs. Some of these were likely native or poorly-discriminated taxa previously over-looked, rather than being recent arrivals: the likeliest such are marked with an asterisk.

<i>Impatiens glandulifera</i>	1889	By water bodies
<i>Epilobium tetragonum</i>	1901	Disturbed places
<i>Lepidium draba</i>	1902	Waysides and waste ground
<i>Bromopsis inermis</i>	1910	Waysides and waste ground
<i>Sisymbrium altissimum</i>	1919	Waysides and waste ground
<i>Sisymbrium orientale</i>	1922	Waysides and waste ground
<i>Veronica polita</i>	1922	Cultivated ground
<i>Fallopia japonica</i>	1923	Waysides and waste ground
<i>Puccinellia distans</i>	1923	Remnant salt-marshes; roadsides from 1997
<i>Senecio squalidus</i>	1923	Waysides and waste ground
<i>Hirschfeldia incana</i>	1926	Waysides and waste ground
<i>Malva parviflora</i>	1927	Cultivated ground
<i>Chenopodium ficifolium</i>	1930	Arable, disturbed ground and roadsides
<i>Galinsoga parviflora</i>	1936	Cultivated and waste ground; and waysides

<i>Epilobium ciliatum</i>	1937	Disturbed and waste ground; also elsewhere
<i>Polygonum cognatum</i>	1940	Grain alien origin
<i>Impatiens capensis</i>	1941	Canals
<i>Rubus chamaemorus*</i>	1941	One native moorland site
<i>Tellima grandiflora</i>	1941	Damp and shady places
<i>Foeniculum vulgare</i>	1945	Waysides
<i>Cochlearia danica</i>	1948	First seen on railways; roadsides from 1983
<i>Epilobium brunnescens</i>	1956	Damp tracks; by ditches and streams
<i>Petasites fragrans</i>	1952	Waysides and damp places
<i>Rorippa microphylla</i>	1953	A native of marshes & edges of water bodies
<i>Bidens frondosa</i>	1954	Canal sides
<i>Pilosella peleteriana*</i>	1954	A native of rocky limestone slopes
<i>Veronica anagallis-aquatica*</i>	1954	A native of marshes & edges of water bodies
<i>Veronica filiformis</i>	1955	Short turf
<i>Senecio inaequidens</i>	1965	Waysides and waste ground
<i>Azolla filiculoides</i>	1968	Pools, ditches and canals
<i>Crassula helmsii</i>	1968	Pools
<i>Galinsoga quadriradiata</i>	1968	Cultivated and waste ground; and waysides
<i>Heracleum mantegazzianum</i>	1968	Roadsides and waste ground; by watercourses
<i>Festuca altissima*</i>	c. 1968	A native of steep, wooded slopes
<i>Eleocharis uniglumis*</i>	1972	Native in a salt-marsh and a base-rich meadow
<i>Crepis biennis</i>	1974	Waysides and waste or disturbed ground
<i>Fallopia sachalinensis</i>	1975	Waste places
<i>Orobanche minor</i>	1976	A native, parasitic at a few scattered sites
<i>Buddleja davidii</i>	1977	Waste ground and waysides
<i>Corynephorus canescens</i>	1977	Sandy heathland
<i>Briza maxima</i>	1980	Waysides and waste ground
<i>Scrophularia umbrosa*</i>	1980	Native on banks of River Severn
<i>Elodea nuttallii</i>	1982	Canals and water bodies
<i>Pilosella flagellaris</i>	1985	Grassland, banks and by paths
<i>Pilosella praealta</i> ssp. <i>praealta</i>	1985	Disturbed ground
<i>Ceratochloa carinata</i>	1987	A streamside and disturbed places
<i>Anisantha diandra</i>	1988	Arable weed
<i>Carex arenaria</i>	1989	By railway sites
<i>Cotula coronopifolia</i>	1989	On bare mud, in marshes
<i>Tolmiea menziesii</i>	1989	Damp woodland and a river bank
<i>Lagarosiphon major</i>	1990	Pools
<i>Myriophyllum aquaticum</i>	1990	Pools
<i>Trichomanes speciosum*</i>	1991	As a gametophyte only
<i>Stellaria pallida*</i>	1997	Limestone grassland!
<i>Lemna minuta</i>	1998	Pools and canals
<i>Carex montana*</i>	1999	A single native, acidic woodland flush site
<i>Solanum physalifolium</i>	1999	Arable weed
<i>Hydrocotyle ranunculoides</i>	2000	Pools and canals
<i>Geranium rotundifolium</i>	2001	Waste and disturbed ground
<i>Coryza sumatrensis</i>	2000	Waysides and waste ground
<i>Fumaria purpurea</i>	2002	A single native site on a laneside bank
<i>Rumex cristatus</i>	2002	By two ditches
<i>Bidens connata</i>	2003	Canal sides
<i>Atriplex littoralis</i>	2004	Roadsides
<i>Epipactis phyllanthes*</i>	2004	Native at two shady sites near watercourses

A number of species thought extinct have been re-found since the publication of Edees' *Flora* (albeit sometimes in a different habitat from where originally found). Examples include: *Ranunculus sardous*; *Myosurus minimus*; *Pyrola minor*; *P. rotundifolia*; *Monotropa hypopitys*; *Anagallis minima*; *Gentianella campestris* (but which has not been seen during the last ten years); *Mimulus moschatus*; *Orobanche rapum-genistae*; *O. elatior*; *Crepis vesicaria*; *Eleocharis acicularis*; *Eleogiton fluitans*; *Neottia nidus-avis*; and *Platanthera bifolia*.

The frequency of some other species has markedly increased, even taking into account the fact that earlier botanists were often reluctant to record garden escapes or obvious "aliens". This is particularly true of ornamental aquatics and marginals (such as *Ranunculus lingua*; *Lysimachia vulgaris*; *Butomus*; *Stratiotes* and *Typha angustifolia*): presumably as the result of deliberate or accidental introduction. Garden throw-outs (e.g. *Aquilegia vulgaris*; *Lysimachia punctata*; *Polemonium caeruleum*; *Hyacinthoides x massartiana*; *Galanthus nivalis*; *Iris foetidissima*; and *Crocasmia x crocosmiflora*) that have become established in the wild are now better recorded, but are also actually now appreciably more frequent. The increased presence of *Chenopodium rubrum* has been aided by the fact that it is a nitrogen-lover, which has a liking for slurry and the exposed mud at the margins of eutrophicated ponds; that of *Carex pendula* is harder to explain, but wild population have certainly been augmented by deliberate introductions and escapes from cultivation.

Some ferns (such as *Phyllitis scolopendrium*, and also *Polystichum setiferum* and *P. aculeatum*) seem to have markedly increased, even accepting that Shield-ferns may have previously been over-looked at some sites. They are no longer collected as during the 19<sup>th</sup> Century fern-craze and they may have responded to a generally warmer, wetter climate.

## 4. Important Figures in Staffordshire Botanical History.

[This approximate time-line merely supplements the account in Chapters 11 and 13 of the 2011 *Flora*.]

1630 1650 1670 1690 1710 1730 1750 1770 1790 1810 1830 1850 1870 1890 1910 1930 1950 1970 1990 2010

.....Ray.....

.....Plot...

....Withering..

....Stokes.....

.....Gisborne.....

.....Pitt.....

.....Dickenson..

Forster

.....Garner.....

.....Brown.

.....Fraser.....

.....Bagnall..

.....Berrisford....

.....Reader.

.....Ridge...

.....Edees.....

.....Fowler..

[The dotted lines indicate life-spans; the names themselves are positioned to indicate the dates of major publications.]