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Presidential Address, 1992

P. MACPHERSON

COLONISATION OF THE GLASGOW GARDEN FESTIVAL SITE THREE YEARS ON: IMPLICATIONS FOR RECORDING

I have been asked for how long I hesitated before accepting the honour of Presidency of this Society, bearing in mind the custom of there being a Presidential Address. My reply was, "not half a second – at the time, I had completely forgotten this responsibility". Once the revelation dawned, search for an appropriate subject became a recurring thought.

I felt that the occasion merited original work and, being an amateur field botanist, that had to be amateur field botany. By profession I have been a neuroradiologist, specialising in depth in a small branch of medicine. My inclination was therefore to do the same for this address and during last summer it gradually became apparent to me that an intensive study of the flora then colonising the site of the Glasgow Garden Festival was the most appropriate review that I could undertake. While doing so, I realised that this raised general issues of plant recording.

THE FESTIVAL SITE

To set the scene, the Festival was held in 1988 in abandoned dockland and quayside on the south side of the River Clyde (Fig. 1). The main area had been the very active Prince's Dock with a Canting Basin, the latter used by the ships to swing round to enable entry to an individual dock or return to the river. The extension of the site to the east took over the Mavisbank Quay.

When the dock complex became redundant it was taken over and the docks filled in with a view to housing, but temporarily let as the site of the Garden Festival. The area is just within v.c. 77 (Lanarkshire), for which I am Recorder.

The brochure stated that the Festival was part of a process of regeneration which was transforming the South Side of Glasgow. One million trees and flowering shrubs formed the backdrop to an ever-changing floral carpet of bedding displays and themed gardens. There were six theme sectors in the main section, arranged like the petals on a flower, interlinked by winding pathways and formal avenues. The effect was also likened to a Persian carpet.

There were gardens set up by commercial organisations, the National Trust for Scotland, botanic gardens and wildlife groups, and a series of ten International Friendship Gardens from as far apart as Finland, China, New Zealand and Mexico. The Canting Basin was used extensively for water-related activities and referred to in one of the maps as Princes Harbour.

Above all however, the Festival was about family fun with concerts, street theatre, exhibits, viewing tower, vintage trams and trains and play areas. The Director called it a festival in a garden rather than a garden festival (Fig. 2).

Immediately the Festival closed, work was begun in preparation for the further development of this 48 ha site. Some plants were sold, and others taken to form the basis of continuing feature gardens elsewhere. The bulldozers moved in again and although there were a few residual, almost intact borders and remnants, by 1990 practically all trace of the Festival had been removed and looking at the site in 1991 when the main area had largely returned to being waste ground, one could hardly imagine that it had ever been. In addition little hollows looked as though they had been like that for centuries with Compact, Hard, Soft and Jointed Rushes. (I was once told by a professional horticulturist that he wished I would stop pronouncing the scientific names of plants as though they were diseases!)

I did not record plants which were at the site of original planting or had simply spread in the neighbourhood. An example is that related to the waterfall which is still bordered by the planted material and the little pond at its base containing such species as Fringed Water-lily (*Nymphoides*

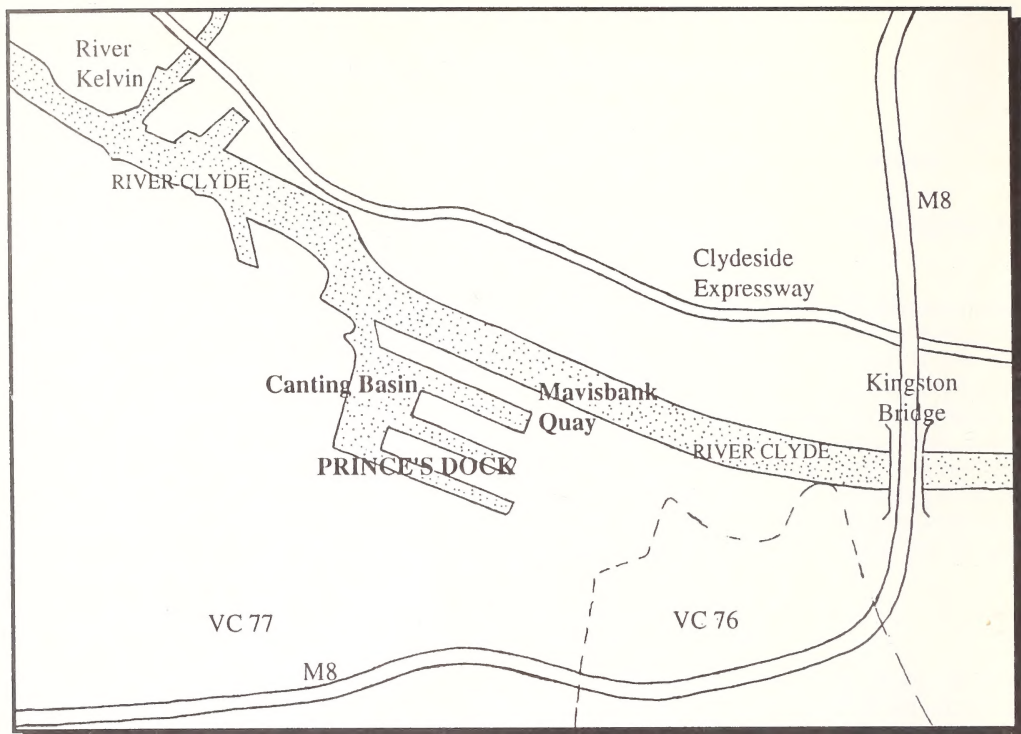


FIGURE 1. The site and environs of the Glasgow Garden Festival in its pre-festival state. V.c. 77, Lanarks.; v.c. 76, Renfrews.

peltata), Water-plantain (*Alisma plantago-aquatica*) and Bulrush (*Schoenoplectus lacustris*). From the waterfall a stream had been constructed which ran through a series of small ponds to the Canting Basin; again with residual plants such as Wild Angelica (*Angelica sylvestris*), Yellow Loosestrife (*Lysimachia vulgaris*) and Reedmace (*Typha latifolia*).

I was surprised to see the size of fish that local lads were catching in the ponds. They were very pleased to be photographed and asked if their photos would be in the papers. I said, "No, but I am writing an article about the site and might show the pictures in London". One asked, "Are you a famous author we should have heard about?"!!

There will be no point in any of you asking me afterwards what kind of fish these were. My family will tell you that I have a two-track mind, neuroradiology and field botany, and I do appreciate the great honour of being President of the two relevant national societies at the same time. The British Society of Neuroradiology, although a smaller organisation, presents their president with a medal and I take this opportunity of suggesting that you might so honour future Presidents with a badge of office that can be worn at the Annual and Exhibition Meetings and other Conferences.

THE PLANT RECORDING

As a result of intensive recording the total number of species came to 325, which I have divided into six groups (Fig. 3).

PLANTS ON THE SCOTTISH FIELD CARD

With regard to those plants which are on the Scottish Field Card (194 species), these in the main are those that might have been expected to have arrived by natural dispersal. However, some could

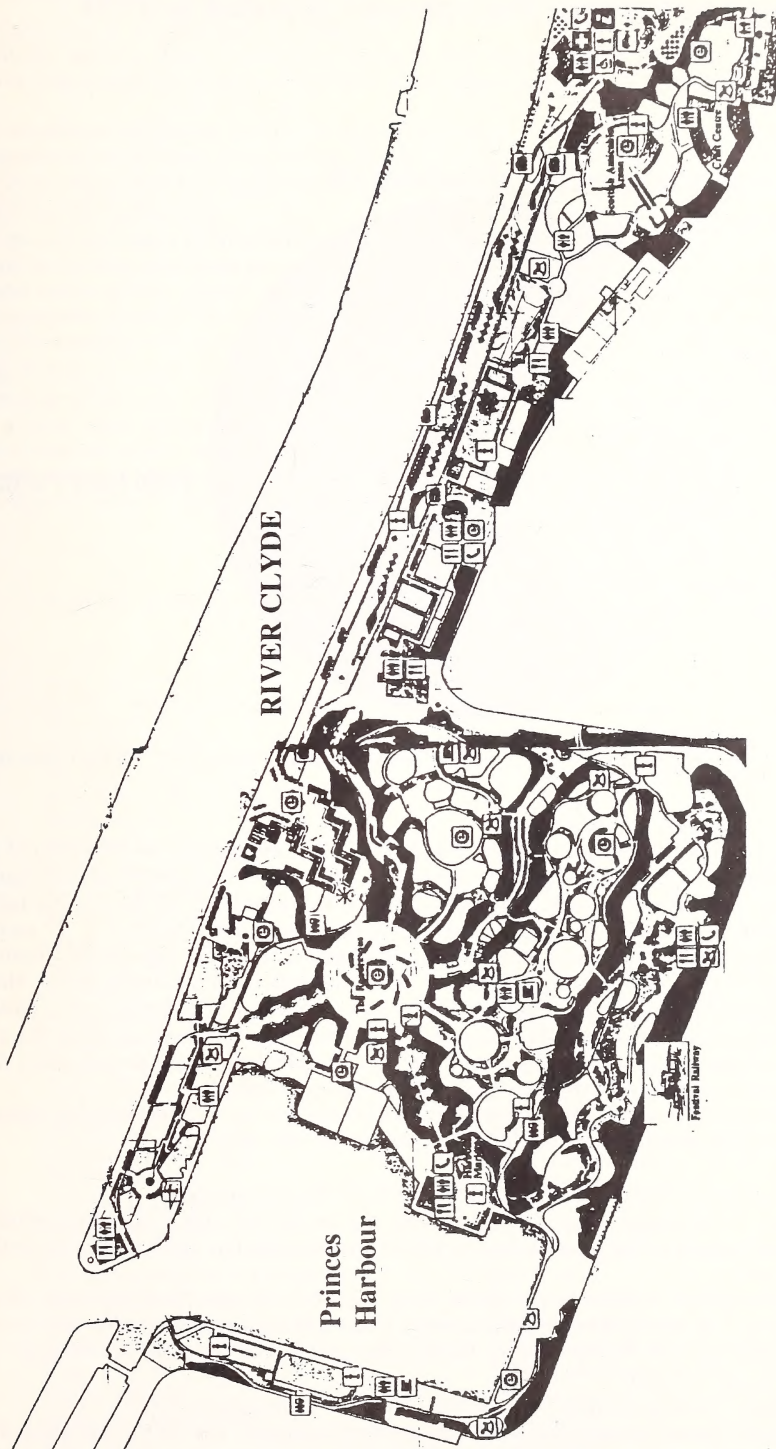


FIGURE 2. Schematic layout of the Glasgow Garden Festival.

1988 Garden Festival Site: plants recorded in 1991

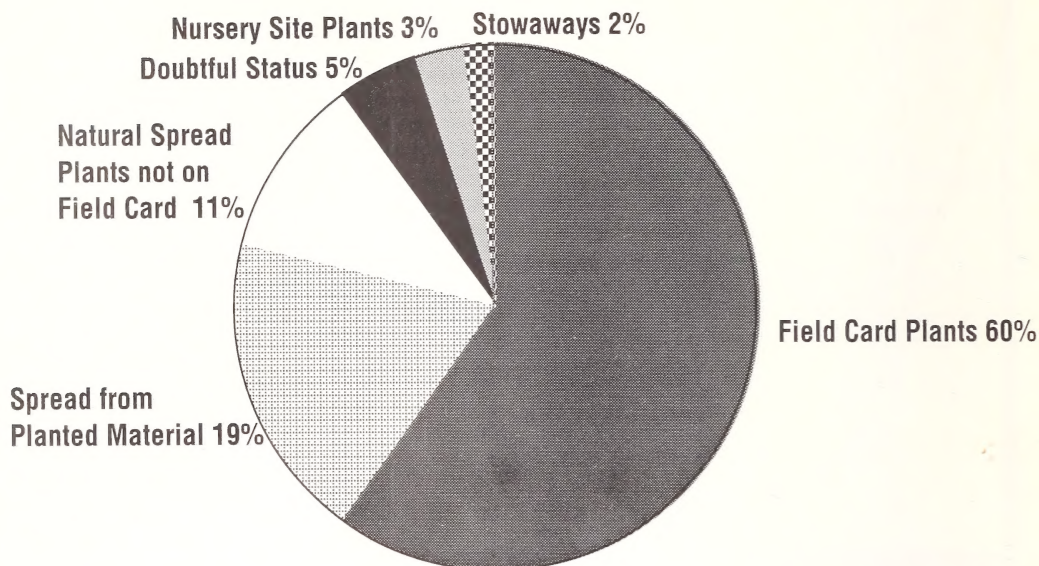


FIGURE 3. The results of plant recording in 1991 on the Glasgow Garden Festival site. 325 taxa were recorded in all.

perhaps more appropriately have been placed in one of the other categories. As examples of spread from planted or presumed planted material, I cite Hemp-agrimony (*Eupatorium cannabinum*) and Marjoram (*Origanum vulgare*), which, although common in other parts of the British Isles, are relatively unusual in the area. Perring & Walters (1962) give only one definite v.c. 77 record for each. When I tell you that on a bank were about ten plants of Greater Spearwort (*Ranunculus lingua*), you may well raise your eyebrows. Greater Spearwort had been planted in and by the pond at the base of the waterfall, i.e. diagonally about 100 m away, with a tree border between. How did it get to the bank? Water Dock (*Rumex hydrolapathum*) growing happily on the pebbly shore of the Canting Basin was almost certainly a feature of the planting along the stream, the seeds floating down. There is only one other site for this plant in the Glasgow area.

Although Tormentil (*Potentilla erecta*) and Hare's-tail Cottongrass (*Eriophorum vaginatum*) are common in the neighbourhood, they obviously arrived at the site with peat.

PLANTS WHICH ARRIVED BY NATURAL SPREAD BUT ARE NOT ON THE FIELD CARD

By natural spread, at this stage, I simply mean plants not on the Scottish Field Card, which have colonised from the vicinity of the Festival Site or whose introduction has nothing directly to do with the Garden Festival.

Of the 36 plants in this category some have been wind-blown, like Butterfly-bush (*Buddleja davidii*) and five species of Hawkweed (*Hieracium*). I was told by a referee not to bother coming down to the riverside at Kew, but to look for *Rumex obtusifolius* var. *transiens* in Glasgow – and at the site I made my first record.

Other plants have been bird-sown, such as five species of *Cotoneaster*.

Dense Silky-bent (*Apera interrupta*) was actually present at another part of the site while the area was still dockland and may have persisted, while Fodder Vetch (*Vicia villosa*) has been present for

six years across the river and one square down. Large Trefoil (*Trifolium aureum*) keeps appearing and disappearing at various sites in Glasgow.

The rarest species were Canadian Fleabane (*Conyza canadensis*) and Least Pepperwort (*Lepidium virginicum*) growing on otherwise bare, gravelly ground and both new v.c. records.

DEFINITE OR PRESUMED SPREAD FROM PLANTED MATERIAL

The complete list of 62 species is given in Table 1.

In the main the spread had been wind-blown on to bare ground produced by bulldozing or with soil shifted by the bulldozers.

There was only a single plant of some taxa such as *Achillea millefolium* 'Cerise Queen', *Anchusa azurea* and *Artemisia stelleriana* growing on bare ground and *Saxifraga paniculata* on a stony path.

Between two and five plants were noted of most species such as *Artemisia ludoviciana* and *Armeria maritima* growing on bare ground. What was Thrift doing in the centre of Glasgow unless from planted material? So although *Armeria maritima* is on the Field Card I have not crossed it off, recording it only as a cultivar. Milk Thistles (*Silybum marianum*) were on a soil heap; *Eryngium planum* was on a bank; one plant of *Hemerocallis* was on a soil heap and another was at the sheltered edge of a bare open patch; Japanese Wineberry (*Rubus phoenicolasius*) was at the edge and extending down on to the shore of the Canting Basin.

There were over 50 plants of Pearly Everlasting (*Anaphalis margaritacea*) scattered widely and about 50 also of Yellow Chamomile (*Anthemis tinctoria*) but with a more local distribution. By far

TABLE 1. DEFINITE OR PRESUMED SPREAD FROM PLANTED MATERIAL
ON THE GLASGOW GARDEN FESTIVAL SITE
Taxa (62 in all) not on the field card.

<i>Achillea millefolium</i> 'Cerise Queen'	<i>Hyssopus officinalis</i>
<i>Achillea ptarmica</i>	<i>Lamium galeobdolon</i> subsp.
<i>Alchemilla mollis</i>	<i>argentatum</i>
<i>Anaphalis margaritacea</i>	<i>Lamium galeobdolon</i> subsp.
<i>Anaphalis margaritacea</i> var. <i>revoluta</i>	<i>galeobdolon</i>
<i>Anchusa azurea</i>	<i>Leucanthemum</i> × <i>superbum</i>
<i>Anthemis tinctoria</i>	<i>Lychnis coronaria</i>
<i>Armeria maritima</i> cv.	<i>Lythrum salicaria</i> cv.
<i>Artemisia absinthium</i>	<i>Melissa officinalis</i>
<i>Artemisia ludoviciana</i>	<i>Mentha</i> × <i>villosa</i>
<i>Artemisia stelleriana</i>	<i>Narcissus pseudonarcissus</i> cv.
<i>Astilbe</i> cf. <i>japonica</i>	<i>Narcissus tazetta</i>
<i>Berberis</i> sp.	<i>Nepeta</i> × <i>faassenii</i>
<i>Borago officinalis</i>	<i>Phalaris arundinacea</i> var. <i>picta</i>
<i>Campanula medium</i>	<i>Polygonum bistorta</i> 'Superbum'
<i>Campanula persicifolia</i>	<i>Potentilla fruticosa</i> hybrid
<i>Carex pendula</i>	<i>Pulmonaria officinalis</i>
<i>Cornus sericea</i>	<i>Ribes sanguineum</i>
<i>Cotoneaster salicifolius</i>	<i>Robinia pseudoacacia</i>
<i>Cotoneaster</i> × <i>suecicus</i>	<i>Rubus phoenicolasius</i>
<i>Dianthus barbatus</i> cv.	<i>Saxifraga paniculata</i>
<i>Elaeagnus angustifolia</i>	<i>Senecio cineraria</i>
<i>Eryngium planum</i>	<i>Silybum marianum</i>
<i>Festuca brevipila</i>	<i>Spiraea douglasii</i> × <i>S. salicifolia</i>
<i>Geranium endressii</i> × <i>G. versicolor</i>	<i>Spiraea</i> sp.
<i>Geranium macrorrhizum</i>	<i>Symphoricarpos</i> cf. × <i>chenaultii</i>
<i>Geranium sanguineum</i>	<i>Symphoricarpos albus</i>
<i>Geranium</i> × <i>magnificum</i>	<i>Tellima grandiflora</i>
<i>Geum</i> cv.	<i>Tolmiea menziesii</i>
<i>Hemerocallis</i> sp.	<i>Verbena rigida</i>
<i>Hippophae rhamnoides</i>	<i>Vinca major</i>
<i>Hosta</i> sp.	<i>Viola lutea</i> cv.

TABLE 2. TAXA OF DOUBTFUL STATUS ON THE GLASGOW GARDEN FESTIVAL SITE

<i>Angelica archangelica</i>	<i>Oenothera biennis</i> × <i>O. glazioviana</i>
<i>Aster</i> sp.	<i>Phalaris canariensis</i>
<i>Cotoneaster conspicuus</i>	<i>Rosa rugosa</i>
<i>Ligustrum ovalifolium</i>	<i>Rubus cockburnianus</i>
<i>Linum usitatissimum</i>	<i>Salix alba</i> × <i>S. fragilis</i>
<i>Lysimachia punctata</i>	<i>Salix discolor</i>
<i>Mimulus cupreus</i> × <i>M. luteus</i> × <i>M. variegatus</i>	<i>Solidago gigantea</i>
<i>Myosoton aquaticum</i>	

the most common plant in this category was Purple Loosestrife (*Lythrum salicaria* cv.) which had been a feature of water-side planting but had spread to most parts of the site regardless of soil or moisture.

DOUBTFUL STATUS

Some of those on this list (Table 2) might have been from planted material but their introduction could equally well have been from other categories. 15 species were of doubtful status.

Japanese Rose (*Rosa rugosa*), White-stemmed Bramble (*Rubus cockburnianus*) and Early Goldenrod (*Solidago gigantea*) have been growing for many years in the neighbourhood. With regard to two plants of Garden Angelica (*Angelica archangelica*) growing well in from the river one can speculate fancifully. The plants grow on top of all the wooden piles near the mouth of the nearby River Kelvin (Macpherson 1984). The docks at the Festival Site were partly filled in with dredgings from the river. However as the seeds are more likely to float than sink to the bottom, then perhaps two were picked up as a bucket broke the surface!

Water Chickweed (*Myosoton aquaticum*) surprised me; one plant in a stony hollow at the edge above the Canting Basin, but then it can be an import and flourish on dry ground, as in London (Burton 1983). The *Mimulus cupreus* × *M. luteus* × *M. variegatus* was less than 2 cm high – the name being much longer than the plant! Flax (*Linum usitatissimum*) and Canary-grass (*Phalaris canariensis*) possibly came from bird seed.

'STOWAWAYS'

Plants whose introduction I presume to have been in soil round plants brought for display. I have excluded plants which are on the Field Card, such as those brought in with peat as mentioned above, or with woodland planting such as Wood Speedwell (*Veronica montana*) which leaves seven species (Table 3).

Although there was much planting in and along the waterfall and stream I cannot imagine that Orange Foxtail (*Alopecurus aequalis*) was brought intentionally, but there it was, one plant on the muddy edge – from whence did it come?

Free access was available to only one tiny part of the site in 1990 and on part of a bare trodden pathway there were six plants of Smooth Rupturewort (*Herniaria glabra*). 40 m farther on (in the next 1 km square) there were a further nine. In 1991 there were more than 50 plants. This species is even rarer than the *Alopecurus* in the British Isles.

I assume that Spiny Restharrow (*Ononis spinosa*) came with seed for sowing the grassy bank near the waterfall. Like the two mentioned above and Sulphur Cinquefoil (*Potentilla recta*), also in this group, this plant has not been recorded before in the vice-county.

TABLE 3. 'STOWAWAYS' ON THE GLASGOW GARDEN FESTIVAL SITE

<i>Alopecurus aequalis</i>
<i>Geranium pyrenaicum</i>
<i>Herniaria glabra</i>
<i>Melilotus indicus</i>
<i>Ononis spinosa</i>
<i>Potentilla recta</i>
<i>Rumex acetosella</i> var. <i>tenuifolius</i>



FIGURE 4. A personal 'Access' card designed by the author.

NURSERY SITE

In addition to the actual Garden Festival Site itself there is an adjacent area, connected by a short tunnel under the intervening road, in which plants were stored, either in containers or shoved into the ground while their sites were being prepared, or in some cases as substitutes to provide flowering colour throughout the season. It is an area of 3.5 ha.

It is still fenced off, but like most such pieces of ground, at least in Glasgow, if one searches one is bound to find a gap where someone has cut a way in!

With regard to the main site, the Security Officer became interested in my survey and kept asking if I had been to such and such a part where he had seen flowers – as opposed to weeds! At the Norfolk Recorders' Conference I suggested that we be issued with a card and that seemed to meet with general approval, but as none was forthcoming I designed my own (Fig. 4). Of course it has no official standing but never fails to impress.

I have included the Nursery Site (Table 4) because it was very much part of the festival complex as far as plants were concerned and had eleven additions to what were seen elsewhere. *Agrostis scabra* we see in hundreds, if not thousands each year in Glasgow. *Crepis setosa* reached Glasgow in 1984 but as a casual only (Macpherson 1990). In both 1990 and 1991 there were at least 40 plants on the bank of the track as it dipped down to go under the road, with two plants having crept into the Garden Festival site. *Genista hispanica* had definitely spread from planted material as presumably had the *Hosta*.

I had nipped in during 1990 and the most interesting plant was a tufted, reddish sedge identified for me as *Carex buechananii*, a native of New Zealand and possibly new to Britain as a wild plant. In 1990 one flowering plant was present. In 1991, the colony had increased to four (Macpherson & Macpherson 1992) and a recent check showed that there had now been a further increase to six. This plant plus one small Sensitive Fern (*Onoclea sensibilis*), more or less hidden away among a group of *Cornus* which had been left over near the boundary wall, would qualify for my 'Stowaway' category.

TABLE 4. TAXA IN THE NURSERY AREA ON THE GLASGOW GARDEN FESTIVAL SITE

<i>Agrostis scabra</i>	<i>Hosta</i> cf. <i>nakaiana</i>
<i>Carex buechananii</i>	<i>Medicago sativa</i>
<i>Cichorium intybus</i>	<i>Mentha</i> × <i>villosa</i> <i>onervata</i>
<i>Cotoneaster sternianus</i>	<i>Onoclea sensibilis</i>
<i>Crepis setosa</i>	<i>Solidago canadensis</i>
<i>Genista hispanica</i> subsp. <i>occidentalis</i>	

DISCUSSION

So now that I have all these records – what are the implications? What do I do with them?

With regard to those which have arrived by what could be natural dispersal I have no problem. I stroke off the Field Card and put a dot on my index card. However I cannot simply accept all that are printed on the Field Card without comment as some are very rare or absent from my vice-county, and had probably spread from deliberate planting, e.g. *Marjoram* and *Hempagrimony*.

The next 'acceptable group' is comprised of those not on the Field Card, but which I assume have not been deliberately brought to the site. Some are actually reasonably common in Glasgow and could have spread on to any suitable ground. These I have no hesitation in recording without comment e.g. *Brassica rapa*, *Heracleum mantegazzianum*, *Senecio squalidus*. With regard to rarities such as Canadian Fleabane and Least Pepperwort, which I assume 'fell off the back of a ship', I have noted the facts, done a drawing of their location and will monitor to see how long they persist as was the case with *Agrostis scabra* which we first saw as a single plant in 1973 and for which I now have eleven personal 1 km² records (Macpherson & Stirling 1988).

The other group not deliberately introduced are my 'stowaways'. I already know that *Herniaria glabra* and *Carex buchananii* are spreading and could easily become established if given a chance.

Of the vast majority of planted material, there is now no trace. With regard to the recording of those which have spread or been spread from Garden Festival planting there is more room for argument. I have filled out a card for those such as *Anchusa azurea*, and even added a dot. These should at least therefore always be available for reference.

What of these so-called aliens? How are they to be regarded?

For reference I selected books from my bookshelves more or less at random. In no sense is this an exhaustive review:

"Human borne seedlings do not seem to me to deserve much consideration. I am not convinced that we ought not to advocate definite action to prevent their settlement" (Raven 1953). A critical comment taken a little out of context, but which one might argue could apply at least to the Giant Hogweed (*Heracleum mantegazzianum*).

Or with disdain: "I almost immediately excluded aliens because they are coming and going in an endless stream, occasionally leaving a mark on our landscape as in the case of *Senecio squalidus*, but more often waifs and strays, left to perish on a dunghill" (Meikle 1953).

Or an intermediate view: "The alien flora is of little importance but must be accounted for as many of the familiar plants of the countryside had their introduction either as aliens or as garden escapes" (Dony 1976).

Or more tolerantly: "The British flora is changing whatever we do but all changes are not always for the worst, some constituting interesting additions to the British flora and not necessarily undesirable" (Brenan 1983).

A few years ago I met a fellow Scottish Recorder and reported that I had v.c. records of Chinese Ragwort (*Sinacalia tangutica*) and Peach-leaved Bellflower (*Campanula persicifolia*), both well established, and which I would pass on. I was told not to bother as they would go straight into the waste-paper basket. *Campanula persicifolia* is also present at the Garden Festival Site, so do I consign the record, specimen and slide to the bin?

For some time I have had a certain reputation for recording 'non-natives' which can brighten up dull routine recording (Dickson 1991), and so appreciate the contents of the *New Flora of the British Isles* which states that "The aim is to include all taxa that the plant hunter might reasonably be able to find in the wild in any one year" (Stace 1991).

I do appreciate that there is a pecking order:

Native – whatever that is! Swann (1977) stated that no two botanists will ever agree about what constitutes a native species. It has been variously defined as: a species believed to have been in the country before man (Lousley 1953; Ellis 1983); part of the natural vegetation for a long time (Briggs 1990); in a natural locality to which it has spread by natural means from a natural source (Dunn 1905); immigrated without the aid of man (Lousley 1953; Ellis 1983; Dickson 1991; Stace 1991); arisen de novo in the country (Lousley 1953; Ellis 1983).

Non-native – unintentional introductions may be regarded as more interesting than those brought in intentionally. Some authors regard alien and introduction as synonymous while others limit introduction to deliberate acts.

Alien plants have been defined as species introduced by the intentional or unintentional agency of man (Lousley 1953; Ellis 1983; Crackles 1990); species introduced by man and now more or less established (Clapham *et al.* 1962).

Introduced alien – deliberately brought to the area for whatever reason (Dickson 1987).

Invading alien – unintentionally brought to the area or arriving in the area by natural means (Dickson 1987).

There is then the question of Naturalised vis-à-vis Established. Some authors make a distinction and regard Naturalised as a more important category: a species naturalised in natural habitats (Hyde & Wade 1934); species naturalised in a natural or semi-natural habitat (Lousley 1953). Others regard them as synonymous: a species which has become self-perpetuating (Stace 1991); an alien plant which has become completely established. Those who differentiate define Established Alien as persisting only in a man-made habitat (Hyde & Wade 1934; Lousley 1953); or in absence of competition from native species (Crackles 1990). The criteria have been widened to include an annual which persists or is repeatedly introduced (Ellis 1983).

Both Naturalised and Established are regarded as more important than Casual (Temporary; Ephemeral; Visitors). There is more unanimity regarding the definition of Casual, the general view being that it refers to a species which does not persist (Lousley 1953; Clapham *et al.* 1962; Ingram & Noltie 1981; Ellis 1983; Crackles 1990; Graham 1988). The terms Ephemeral Alien (Jermyn 1974) and Adventive (Fitter & Fitter 1967) have been used as synonyms for casual.

How long does a plant have to persist before it can be regarded as Naturalised/Established? The plants that I have recorded have persisted for two to three years. Lousley (1953) had suggested 25 years. I am unlikely to persist that long, so when may I put them into Plant Records?

What is an Escape and are all escapes equal? An escape has been defined as: of cultivated origin but not naturalised (Clapham *et al.* 1962; Ingram & Noltie 1981); originally from seed or plants thrown out with garden rubbish (Jermyn 1974); spread vegetatively or by seed from a garden (Stace 1991).

I present a classification of introductions in what could be regarded as a pecking order (Fig. 5).

Other terms used in the literature include:–

Indigenous – native born; originating or produced naturally in a country; opposite of exotic (Kirkpatrick 1983); Exotic – introduced from a foreign country; alien; not native to a country as a plant, etc; romantically – strange, rich or showy (Kirkpatrick 1983); Denizen – doubtful native in a

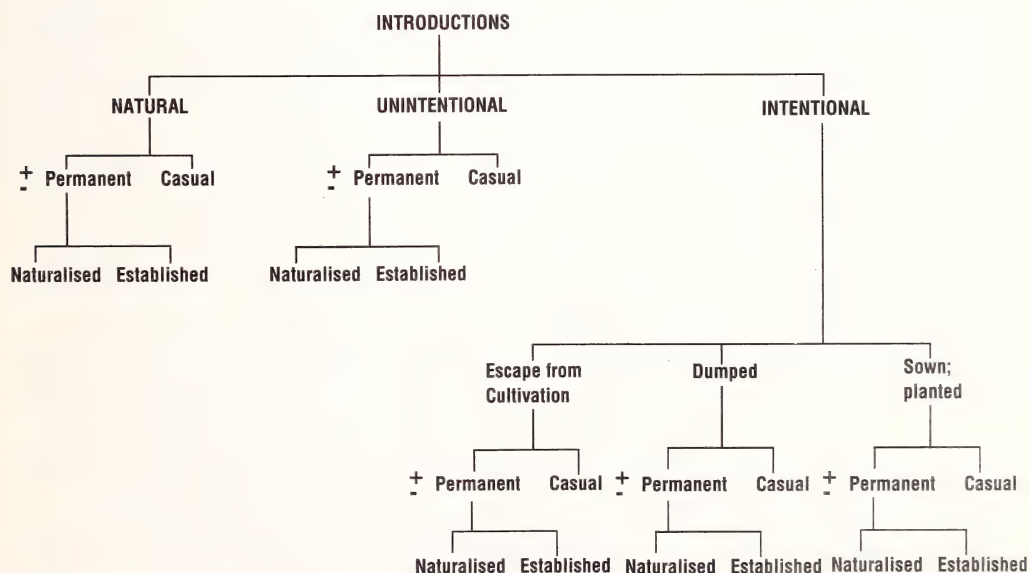


FIGURE 5. Different modes of introduction and permanency in (arguably) decreasing importance from left to right.

natural habitat (Watson 1870; Lousley 1953); an alien species growing in a natural or semi-natural community (Lousley 1953); species growing wild but originally introduced as cultivated crop or herb (Graham 1988; Crackles 1990); native elsewhere in Britain but not in the area (Hall 1980); Adventive – a plant growing unaided but not yet permanently established (Hyde & Wade 1934); not deliberately introduced (Crackles 1990); self-sown or bird-sown garden plant (Briggs 1990) or even Colonist, a category implied in the title of this address – doubtful native in a man-made habitat (Lousley 1953); native elsewhere in Britain but not in the area (Whitehead 1976); species which grows only on man-maintained habitat (Lousley 1953; Graham 1988); alien which is established (Jermyn 1974); synonym of Adventive which is a synonym of Casual (Fitter & Fitter 1967).

So is Pineappleweed (*Matricaria discoidea*) more acceptable, having been brought in unintentionally, than Oxford Ragwort (*Senecio squalidus*) which was actively brought to this country; and that in turn more acceptable because it escaped over the garden wall than Dotted Loosestripe (*Lysimachia punctata*) which was thrown out and is now all over the West of Scotland? It has been recorded in 70 of the 90 *Flora of Glasgow* tetrads. All three plants are on the Garden Festival Site. If I stop to think about it, yes, I agree with the pecking order, but while recording never give it a thought.

I wish to make a comparison. After the Ice-age Britain was:–

- a. wholly or mainly a bare area available for colonisation by plants (Heslop-Harrison 1953); and
- b. a land available for colonisation by people.

As there were no people initially in the British Isles all here now are descendants of those who were native elsewhere. The British Isles have been populated by waves of tribes: Iberians, Celts, Picts, Angles, Saxons, Normans and so on. In the eyes of the Iberians the Celts were invasive intruders, in the eyes of the Celts the Anglo-Saxons were incomers and so it went on. There is even the question of being alien to a district. In the cities people are more readily absorbed into the community but in the Highlands it is often said that families need to remain for a couple of generations before they cease to be Incomers! There is also antipathy in parts of Wales to 'white settlers'. In contrast many people in England more or less regard Great Britain as synonymous with England and therefore include the Scots and Welsh as English! In spite of the above no-one would quibble if most if not all of us claim to be natives of the British Isles. I feel that this may have something to tell us about our attitude to plant status.

With regard to plant distribution within the British Isles some Floras define Alien as not native to the area under discussion, although it may be native in other parts of the British Isles. What are the geographical limits to which this would apply? If a plant is gradually extending into Scotland from England by natural dispersal, are the offspring which cross the border into Scotland to be regarded as aliens? Or, to narrow it down, if a plant arises from seed blown on to suitable ground in Glasgow from a neighbouring so-called native habitat are we allowed to call it Native in Glasgow, in the *Flora of Glasgow*. Certainly 'Alien' would not seem to be appropriate. In other words are the boundaries not rather arbitrary? Even if the term Alien is acceptable for the newly arrived, in general, after one or two generations of people, or rather more in the case of plants, the term is not appropriate.

There is therefore an obvious diversity of opinion regarding the definition of terms or even of their acceptability. "The various terms are not easily, precisely defined as different botanists use them in different ways" (Briggs 1990). "In assessing the status of many species, no two botanists would ever agree, judgement is so much a matter of personal opinion and many of the terms used are themselves arbitrary" (Petch & Swann 1968).

As a further example of differing terminology I present these definitions of Introduced Plant – brought accidentally or intentionally (Clapham *et al.* 1962); deliberately sown or planted (Fitter & Fitter 1967); deliberately brought for whatever reason (Dickson 1987); deliberately sown or planted or garden escape (Graham 1988); brought by man but apparently naturalised (Ingram & Noltie 1981).

Some Presidential Addresses end with such statements as: Further work along the lines of my talk would be a suitable project for the Society (and that is usually the last one hears of it – like my access card and possible Presidential Medals!).

I am going to be more positive and ask if I may set up a little sub-committee with a view to producing agreed unambiguous British Terminology. It should be less controversial than the *English Names of Wild Flowers* which, although many in Scotland object to, I have, with two exceptions (did you notice one in my address?) been prepared to accept for the overall good.

The requirement for clear knowledge of status without ambiguity is clearly indicated by the story of the young man from the West of Scotland who went into a London establishment that he would not have patronised had he known its reputation. He chatted to a young lady for some time and eventually she leant forward, touched his arm and said "You do realise that I am a Call Girl?" He leant back – "Now is that not a co-incidence – I'm from Tiree".

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The correct Latin names for the Primrose and the Oxlip, *Primula vulgaris* Hudson and *P. elatior* (L.) Hill

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ABSTRACT

The correct Latin names for the Primrose and the Oxlip are maintained as *Primula vulgaris* Hudson and *P. elatior* (L.) Hill (Primulaceae), despite recent assertions that the Primrose should be called *P. acaulis* (L.) L. and that a question hangs over *P. elatior*. Additional evidence of Linnaeus's intentions in his *Flora Anglica* is provided in different printings of this work which have been previously overlooked.

INTRODUCTION

It may seem surprising and unfortunate that there should still be disputes over the correct Latin names of the Primrose and the Oxlip after three centuries or more of the study of the European flora and well over two centuries of the adoption of Linnaean binomial nomenclature. However, Greuter (1989a) resurrected the name *Primula acaulis* (L.) L. for the Primrose. This has been adopted in the *Med-Checklist* (Greuter, Burdet & Long 1989), and new subspecific combinations have been published by Greuter & Burdet (Greuter 1989b). It has also been maintained that unless the arguments for this are accepted it is impossible to maintain the name *P. elatior* for the Oxlip. The decisions depend largely on interpretation of Linnaeus's *Flora Anglica* (1754), a dissertation defended by his student Grufberg. During preparation of the account of Primulaceae for the *Flora of Cyprus* (Meikle 1985), we looked into this question and were satisfied that there was no threat to the well-established *P. vulgaris* Hudson, and we maintain this position now. Re-examination of the facts has brought to light an overlooked significant variation in the typography of the 1754 *Flora Anglica*, which reinforces our opinions.

THE LATIN NAME OF THE PRIMROSE

In *Species Plantarum* (1753), Linnaeus did not provide a specific binomial for the Primrose because he adopted a broad species concept, recognising the Cowslip, Oxlip and Primrose as one species, *P. veris*, with three varieties, var. *officinalis*, var. *elatior* and var. *acaulis* respectively. (This taxonomic concept persisted in British botany through all editions of Bentham's *Handbook of the British Flora*, to Rendle's 7th edition in 1924.) In 1762 William Hudson published his *Flora Anglica*, including the Cowslip and Oxlip in *P. veris* but raising the Primrose to specific rank with the new name *P. vulgaris*. In 1765 John Hill also gave the Primrose specific rank, but took up Linnaeus's varietal epithet *acaulis* as *P. acaulis*, a name which has occasionally been adopted since. However, at specific rank *P. vulgaris* Hudson has three years' priority over *P. acaulis* (L.) Hill and so has been widely adopted.

The current argument is over the rank given to the Primrose in Linnaeus's *Flora Anglica* (1754). Greuter (1989a) has concluded that here Linnaeus raised the Primrose to specific rank under the

Echium	<i>vulgare</i>	227 - 1.	Solanum	<i>nigrum</i>	265 - 4.
	<i>Lycopsis</i>	227 - 2.		<i>Dulcamara</i>	265 - 1-2.
Primula	<i>veris officinalis</i>	284 - 3.	Ramnus	<i>catharticus</i>	466 - 1.
	<i>elatior</i>	2.		<i>Frangula</i>	465 - 1.
	<i>acaulis</i>	1.	Evonymus	<i>europaeus</i>	468 - 1.
	<i>farinosa</i>	285 - 1.	Ribes	<i>rubrum</i>	456 - 1.
Menyanthes	<i>trifoliata</i>	285 - 1.		<i>alpinum</i>	456 - 2.
	<i>Nymphoides</i>	368 - 2.		<i>nigrum</i>	456 - 4.
Hottonia	<i>palustris</i>	285 - 1.	Hedera	<i>helix</i>	459 - 1.
Lysmachia	<i>vulgaris</i>	282 - 1.		<i>Illecebrum verticillatum</i>	160 - 1.
	<i>thyrsiflora</i>	283 - 3.	Glaux	<i>maritima</i>	285 - 1.
	<i>Nummularia</i>	283 - 1.	Thesium	<i>Linophyllum</i>	202 - 1.
	<i>memorum</i>	282 - 5.	Vinca	<i>minor</i>	268 - 1.
Anagallis	<i>arvensis</i>	282 - 1.		<i>major</i>	268 - 2.
					DI-

FIGURE 1. Linnaeus's *Flora Anglica* (1754); lower part of p. 12, from Ray Society 1973 facsimile.

name *P. acaulis*, so that this name has priority over *P. vulgaris* Hudson (1762). Stearn (1973, p. 68), however, in collaboration with the late J. E. Dandy, had concluded that Linnaeus merely repeated his taxonomy of *Species Plantarum* in his *Flora Anglica*, and that apparent inconsistencies were due to obvious slips of the pen or typographical errors. Greuter reproduced in facsimile the relevant page of Linnaeus's *Flora Anglica* (see Fig. 1), and argued that names given there which are neither trinomial nor subordinated by indentation must be accepted as specific binomials. In the case of *Primula*, 'veris officinal[is]' appears on one line, with 'elatior', 'acaulis' and 'farinosa' on successive lines indented only very slightly under 'veris'. The indentation, or lack of it, may here tend to suggest that all four taxa were given specific rank. As Greuter has noted, the italicisation of *acaulis* merely denotes that this taxon does not occur in Sweden.

However, when we looked again at the Kew copy of *Flora Anglica* (see Fig. 2) which we had consulted ten years ago, we found that the typesetting is different from that of the Ray Society's facsimile edition (1973), and that 'elatior' and 'acaulis' are indeed indented under 'veris' almost to the position of the varietal epithet 'officinal[is]', while 'farinosa' is indented almost as far. There are similar inconsistencies between copies in indentation on the same page (see *Echium*, *Ribes*, *Hedera*, *R[h]amnus*, *Vinca*) and on other pages, and it is clear that there were at least two different printings of this dissertation and that the typesetting indentation was haphazard. We are grateful to Dr J. L. Reveal for informing us that the Natural History Museum, London possesses both printings. It appears that in the version represented at Kew the printer was instructed to remove excessive spaces between some generic names and the following epithets without moving succeeding epithets, so that indentations become quite different. Indentation thus appears meaningless as far as evidence of rank is concerned. It would be false to argue that in the Kew copy the position of the epithets *alpinum* and *nigrum* in relation to *rubrum* under *Ribes* (see Fig. 2) indicates that they represent infraspecific taxa. But certainly, if the Kew copy alone were considered, the weight of evidence from indentation alone would indicate that Linnaeus still regarded *elatior* and *acaulis* as varieties of *P. veris* and not as separate species, contrary to Greuter's conclusion.

But the clinching evidence of what Linnaeus did or did not do in *Flora Anglica* is provided by a point already stressed by Stearn (1973, p. 68). For the Cowslip, Linnaeus employed the trinomial *Primula veris officinal[is]*, indicating that he still recognised varieties in the species. If he had raised all three taxa to specific rank he would certainly have dropped the varietal epithet *officinalis*. To our knowledge, in all his botanical works he never employed a varietal epithet in species in which he did not recognise varieties. The aim of *Flora Anglica* was essentially to list the known flora of England according to the binomial system, and although he did introduce a few novelties (Stearn 1973, pp. 63-68), in the case of *Primula* it is clear that he merely retained his taxonomy from *Species*

Echium vulgare	227 - 1.	Solanum nigrum	265 - 4.
<i>Lycopsis</i>	227 - 2.	Dulcamara	265 - 1-2.
Primula veris officinal.	284 - 3.	Ramnus catharticus	466 - 1.
<i>elatior</i>	2.	Frangula	465 - 1.
<i>acaulis</i>	1.	Evonymus europæus	468 - 1.
<i>farinosa</i>	285 - 1.	Ribes rubrum	456 - 1.
Menyanthes trifoliata	285 - 1.	<i>alpinum</i>	456 - 2.
<i>Nymphoides</i>	368 - 2.	<i>nigrum</i>	456 - 4.
Hottonia palustris	285 - 1.	Hedera helix	459 - 1.
Lysmachia vulgaris	282 - 1.	Illecebrum verticillatum	160 - 1.
<i>thyrsiflora</i>	283 - 3.	Glaux maritima.	285 - 1.
Nummularia	283 - 1.	Thesium Linophyllum	202 - 1.
<i>nemorum</i>	282 - 15.	Vinca minor	268 - 1.
Anagallis arvensis	282 - 1.	<i>major</i>	268 - 2.
			DI-

FIGURE 2. Linnaeus's *Flora Anglica* (1754); lower part of p. 12, from Kew copy.

Plantarum published the previous year. The erratic behaviour of a typesetter in 1754 does not alter the facts and cannot be used as a reason to upset established nomenclature of a well-known plant. Nor is the issue affected by the slightly more orderly, but still inconsistent, typesetting of the reprint of *Flora Anglica* in Linnaeus's *Amoenitates Academicæ* (1759, vol. 4), where all four epithets *veris*, *elatior*, *acaulis* and *farinosa* were equally indented under *Primula* (p. 97). The inclusion of the varietal epithet *officinalis* still indicates that Linnaeus had not changed his taxonomy. Indeed, throughout all his works Linnaeus kept the Primrose and the Oxlip as varieties of *Primula veris*. The correct name (and relevant synonyms) at specific rank for the Primrose is therefore as follows:

P. vulgaris Hudson, *Fl. Angl.*, 70 (1762).

P. veris var. *acaulis* L., *Sp. Pl.* 1: 143 (1753).

P. acaulis (L.) Hill, *Veg. Syst.* 8: 25 (1765).

THE LATIN NAME OF THE OXLIP

Having concluded that Linnaeus raised the Primrose and Oxlip from varietal rank in *Species Plantarum* (1753) to specific rank in *Flora Anglica* (1754), Greuter (1989a) has cited the correct name for the Oxlip as *Primula elatior* (L.) L., *Fl. Angl.* 14 (1754) instead of the more usual *P. elatior* (L.) Hill (1765). He has warned that, if this is not accepted, the specific name for the Oxlip will have to change. The reason for this conclusion is that he considers that when Hill in 1765 published the name *Primula elatior* he did not make a new combination based on Linnaeus's *P. veris* var. *elatior* but described a new species, which, according to Schinz & Thellung (1907, p. 333), is not the Oxlip but the hybrid between the Cowslip and Primrose, the False Oxlip. This would then mean that the name *P. × elatior* Hill would have to be applied to the hybrid, that any later combination of Linnaeus's *elatior* at specific rank would be an illegitimate later homonym, and that a new name would have to be found for the Oxlip. Fortunately we cannot agree with this sequence of conclusions.

The fact that Hill may have described and illustrated the hybrid *P. veris* × *vulgaris* under the name *P. elatior* is irrelevant if the latter is a combination based on Linnaeus's var. *elatior* (*International code* . . . Berlin 1987, Art. 7.12). The question therefore is whether Hill made a new combination or described a new species. Throughout the 26 volumes of the quarto edition of *The Vegetable System* (1759–1775), in which the name appeared, Hill never cited any authors for the binomials he used, nor did he cite any basionyms. He was, however, clearly using the Linnaean

system, to which he referred directly in his introduction (Hill 1759, vol. 1, p. 24) with a comment that "it will live . . . so long as there is science". It would be ludicrous to argue that the names he used were independent of those published previously by Linnaeus simply because he used no author citations. Such a conclusion would require that every name in all 26 volumes of the *Vegetable System* should be listed in *Index Kewensis* as new species attributed to Hill.

Article 33.2 of *International code . . . Berlin 1987* requires that a full and direct reference be given in valid publication of a new combination after 1 January 1953, surely with the implication that before 1953 such a reference is not necessary. All the circumstantial evidence, and in particular the coincidence of all the epithets *officinalis*, *acaulis*, *elatior* and *farinosa* under *Primula* in the relevant publications of both Linnaeus and Hill, points to the fact that Hill was merely taking up the earlier Linnaean epithets and was not describing new taxa. The coincidence of the epithets themselves refers us back to Linnaeus, which is confirmed (if it were necessary) by Hill's direct reference to Linnaeus in his introduction, as noted above. Publication of the combination by Hill, not Linnaeus, was accepted in the original volume of *Index Kewensis* (1895) and by generations of botanists since. It is comparable with the combination *Helianthemum nummularium* (L.) Miller, *Gard. Dict.* (ed. 8), [sub]. *Helianthemum* no. 12 (1768), also published with a passing reference to Linnaeus himself in the introduction to the book, and with a reference under the generic name, but without any reference to the basionym *Cistus nummularius* L., *Sp. Pl.* 1: 527 (1753), and nonetheless universally accepted as a new combination at the present time. To maintain today, when the need for nomenclatural stability is being much discussed, that such names should be treated as newly described species, with consequent new typifications, rather than new combinations, would not only be highly undesirable, it would be contrary to the *International code*. We are happy to conclude that the correct name for the Oxlip should be maintained as follows:

***P. elatior* (L.) Hill, *Veg. Syst.* 8: 25 (1765).**

P. veris var. *elatior* L., *Sp. Pl.* 1: 143 (1753).

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(Accepted July 1992)

Short Notes

DIANTHUS ARMERIA L. NEW TO IRELAND AND OTHER RARE PLANTS IN WEST CORK

This note presents a preliminary report of extensive floristic research on Sherkin Island and adjacent islands in Roaringwater Bay to the west of Baltimore, West Cork (vice-county H3). During field-work from March to September 1992, based at Sherkin Marine Station, K.C. (joined by J.R.A., 25 August–4 September) made so many significant records of rare native and ruderal species that it seemed pertinent to make the most interesting results available. All data have been lodged at Sherkin Marine Station. Some of our herbarium voucher specimens of the plants are fragmentary or even lacking, as many of the plants are extremely rare and protected by Irish law. Nomenclature follows Stace (1991).

Dianthus armeria L.

Horse Island, rocky pasture near the sea, 1 September 1992, *J. R. Akeroyd & K. Clarke*, DBN, herb. **Sherkin Marine Station.**

Six plants in all were found, severely grazed by sheep and goats. The plants had anomalous few-flowered inflorescences with secondary growth below, but could be distinguished by the annual/biennial habit and flowers c. 1 cm in diameter, bright reddish-pink and scentless. The leaves, bracts and stems were reddish.

Dianthus armeria, a plant of grasslands on sandy soils, has not previously been reported from Ireland. It occurs over much of southern and central Britain, but is now rare and decreasing (Perring & Walters 1976; Stace 1991). The Irish station is an area of some 12 × 3 m on a south-facing slope of sub-maritime grassland interspersed with a few outcrops of Old Red Sandstone. The species-rich sward, dominated by *Agrostis vinealis* Schreber, *Cynosurus cristatus* L. and *Koeleria macrantha* (Ledeb.) Schultes, is grazed to 5–8 cm, with grass-stems and chewed inflorescences of *D. armeria* up to 18 cm. Further down the slope the grassland is coarser and enriched, with patches of nettles and thistles. On adjacent rock outcrops a more heathy flora, dominated by *Ulex gallii* Planchon, includes a large, unrecorded population of *Ornithopus perpusillus* L., a rare but often overlooked plant in Ireland (fide J. R. Akeroyd & R. FitzGerald). No soil analyses have been carried out, but it may be significant that the site is adjacent to old copper workings.

D. armeria has a wide distribution in Europe, where it extends northwards to southern Norway and westwards to Galicia, Cornwall and mid-Wales (Jalas & Suominen 1986). Its occurrence in southern Ireland, although a welcome surprise, is perhaps therefore not too unexpected. It should certainly be sought elsewhere in W. Cork and on coasts from Co. Cork to Co. Dublin. It is the only member of the genus *Dianthus* that is apparently native to Ireland.

Allium ampeloprasum L. var. *babingtonii* (Borrer) Syme

Sherkin Island, road from church towards Sherkin Point, garden of deserted cottage, July 1992, obs. K. Clarke.

This distinctive leek has long been known from the Aran Islands and the coasts of Clare, W. Galway (Webb & Scannell 1983) and from Donegal, and is also widespread in Scilly and the coast of mainland Cornwall. It is considered to be a relic of ancient cultivation, probably introduced from the Mediterranean region where the species has its centre of distribution, but perhaps a native species (Webb & Scannell 1983). Var. *babingtonii*, endemic to western Ireland and south-western England, is frequently associated with human habitation and old ruins. The Sherkin plants might have been introduced, but they do provide a geographical link between the two main areas of distribution of this variant.

Asplenium obovatum Viv. subsp. *lanceolatum* (Fiori) P. Silva

Cape Clear Island, South Harbour, damp stonework, 3 September 1992, obs. K. Clarke & J. R. Akeroyd.

We observed a single plant of this rare fern at South Harbour, where it had last been recorded, as *A. lanceolatum* Huds., in 1896 (Colgan & Scully 1898). The warden of the Cape Clear Bird Observatory later kindly directed us to a second locality to the west of South Harbour where the plant had been rediscovered by another botanist on a damp stone wall just a few days previously, allowing us to confirm the identity of our own plant.

Centaurium pulchellum (Sw.) Druce

Horse Island, damp grassland above patch of scrub on east coast, 10 m, 19 June 1982, L. C. Wright LW0045, **herb. Sherkin Marine Station**.

We were unable to refine this species ourselves, but the herbarium material represents the only recent record from Co. Cork. It is apparently the first record of this species from Roaringwater Bay since 1818 when it was reported on Cape Clear Island (Colgan & Scully 1898). *C. pulchellum* has recently been rediscovered at several old stations in Co. Wexford (fide J. R. Akeroyd & R. FitzGerald), so may be overlooked.

Kickxia elatine (L.) Dumort.

Sherkin Island, Foardree, open peaty ground on south-facing slope above sea, *obs.* J. R. Akeroyd & K. Clarke, 29 August 1992.

A very rare, submaritime plant in Ireland, now restricted to Counties Cork and Wexford and usually found on cultivated land. It was found at Foardree whilst examining a population of *Lotus subbiflorus* Lag. discovered there earlier (fide K. Clarke). However, we failed to find *K. elatine*, described by Polunin (1949) as "frequent on cultivated ground", elsewhere on Sherkin or Cape Clear Islands, although fragments of a formerly rich weed flora (cf. Polunin 1949, 1950) have survived in the islands.

Rumex pulcher L.

Sherkin Island, above Horseshoe Bay, *obs.* 28 June 1990, 25 August 1992, J. R. Akeroyd.

Ten plants of this rare Irish dock were located in two small colonies at the eastern end of Sherkin Island. This confirms reports from the area by Polunin (1950) and earlier workers. As the species has persisted for nearly 100 years on Sherkin, has been repeatedly recorded in Co. Wexford and is a member of native plant communities (fide J. R. Akeroyd), it cannot be regarded as merely "casual" (Perring & Walters 1976) and is probably native in Ireland.

Tuberaria guttata (L.) Fourr.

E. Calf Island, rock outcrops in heathland, 20 May 1992, K. Clarke C198, **herb. Sherkin Marine Station**.

This confirms an old record of the species from E. Calf, where it was not refound by Polunin (1950). The other Irish stations are all on islands or peninsulas in the extreme west of the country: on the coasts of W. Mayo and W. Galway and on Sheep's Head and Three Castles Head, Co. Cork (recorded by J. R. Akeroyd & D. A. Webb in July 1987), respectively some 25 km to the north-west and west of E. Calf Island.

In addition to the above reports, we have made or confirmed records on Sherkin Island or adjacent islands of many rare or local Irish plants, including *Althaea officinalis* L., *Artemisia absinthium* L., *Lotus subbiflorus*, *Trifolium striatum* L. (cf. O'Mahony 1979), *T. micranthum* Viv., *T. arvense* L., *Torilis nodosa* (L.) Gaertner and *Viola lactea* Sm. The total number of flowering plants and ferns on the islands of Roaringwater Bay, including Cape Clear and Sherkin Islands, now stands at about 500, at least ten of them among the rarest of Irish plants – a flora of remarkable richness. A full Flora of the area is currently being prepared.

ACKNOWLEDGMENTS

We are grateful to Matt Murphy, Director of the Sherkin Island Marine Station, for providing accommodation and facilities for our research, and to Michael and Robbie Murphy for their skillful and cheerful ferrying of us around the waters of Roaringwater Bay. Our work in 1992 on Sherkin

Island would never have been possible without the solid groundwork provided by the studies of Lucy Wright (1981–2) and Jennifer Shockley (1990).

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PILOSELLA × *FLORIBUNDA* (WIMMER & GRAB.) ARVET-TOUVET (ASTERACEAE)
 IN THE BRITISH ISLES

Stewart (1903) recorded *Hieracium auricula* L. from an old limestone quarry at Cave Hill, Belfast, and remarked: "I have known this plant growing on the debris of the Whitewell limestone quarries, Cave Hill, for at least six years. During that time it has neither increased nor decreased. It partially occupies an area of about two square yards. The district around it is uncultivated, save for grass. There are few gardens in the vicinity – none close at hand. I consider it an alien, but how it has reached here is not easily understood". It was first recorded there in 1897 and last seen in 1910 (Wear 1923). Pugsley (1946, 1948) renamed it *H. helveolum* (Dahlst.) Pugsley. Sell and West (Sell 1967) made *H. helveolum* a subspecies of *Pilosella lactucella* (Wallr.) P. D. Sell & C. West. The same authors, when writing the account of *Hieracium* for *Flora Europaea* (Tutin *et al.* 1976), decided it was better put under *Hieracium* × *floribundum* Wimmer & Grab., i.e. *Pilosella floribunda* (Wimmer & Grab.) Arvet-Touvet which is where *H. helveolum* was originally placed by Dahlstedt as subsp. *helveolum*.

P. floribunda is almost certainly a hybrid between *P. lactucella* (Wallr.) P. D. Sell & C. West and *P. caespitosa* (Dumort.) P. D. Sell & C. West, which can spread vegetatively as well as by seed. It differs from *P. caespitosa* by its glaucous, less hairy leaves, and from *P. lactucella* by its much taller habit.

On 21 June 1991, R. P. Bowman discovered 45 or more plants occupying an area of about 4 × 2 m, in grass heath with *Calluna vulgaris* – *Erica tetralix* tussocks, on the wide verge of the B3056 between Stephill Bottom and Pig Bush in the New Forest, S. Hants. v.c. 11, GR SU/35.05, **herb. R.P.B.** It was the site of military emplacements during the 1939–1945 war, and *P. × floribunda* may have been introduced during that period.

It is a good match with the eight plants from the Belfast locality in **CGE**, and with continental material in that herbarium.

Pilosella* × *floribunda (Wimmer & Grab.) Arvet-Touvet in *Bull. Soc. Dauph.* 1880: 280 (1880). Syn. *Hieracium floribundum* Wimmer & Grab., *Fl. Siles.* 2(2): 204 (1829); *Hieracium floribundum* subsp. *helveolum* Dahlst., Hier. Exsicc. 4: nos. 14 & 15 (1891); *Acta Horti Berg.* 2(4): 13 (1894); *Hieracium helveolum* (Dahlst.) Pugsley in *J. Ecol.* 33: 347 (1946); *Pilosella lactucella* subsp. *helveola* (Dahlst.) P. D. Sell & C. West in *Watsonia* 6: 314 (1967).

Rootstock rather thick, sometimes producing leafy stolons. Stems 10–35(–45) cm, erect, rather slender, green below, darker above, with numerous long (to 7 mm), pale, dark-based simple glandular hairs throughout and with numerous to dense, small stellate hairs and numerous, short, dark glandular hairs in the upper part. Leaves 50–180 × 6–20 mm, glaucous-green with a whitish

midrib; the basal numerous, in a rosette, narrowly elliptical or narrowly oblanceolate, the outermost rounded at apex, the inner obtuse or subacute and mucronulate, long attenuate at base to a broadly winged petiole, with few to numerous, long (to 4 mm), pale simple eglandular hairs on or near the margin, and similar ones with red bases along the midrib (sometimes the hairs are found on the surfaces and sometimes small stellate hairs are present on the lower surface); the cauline 0–3, similar to basal but smaller; when stolons are present they bear numerous leaves which are similar to basal but small. Inflorescence of 3–7 capitula, compact; peduncles 3–25 mm, with dense, white stellate hairs, numerous, short, dark glandular hairs, and few to numerous, long simple eglandular hairs. Capitula 15–20 mm in diameter. Involucral bracts 6–9 × 1.0–1.5 mm, dark green with whitish margins, linear-lanceolate, rounded-obtuse at apex, with numerous, very small stellate hairs particularly on the margins, numerous, short, dark glandular hairs down the centre, and few to numerous, long, whitish, dark-based simple eglandular hairs. Ligules bright yellow, paler beneath, glabrous. Styles yellow or slightly discoloured. Margins of receptacle pits shortly dentate. Achenes 2–3 mm, purplish-black.

In Stace (1991) it will key out to *P. caespitosa*, but differs from that species in its bluish-green rather than yellowish-green leaves which are not as hairy on the surface. In Europe it occurs in the north and centre southwards to north Switzerland and the east Carpathians. It is a triploid with $2n = 27$. Little is known about its biology.

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REGENERATING BALSAM POPLAR (*POPULUS CANDICANS* AIT.) × BLACK POPLAR (*P. NIGRA* L.) (SALICACEAE) AT A SITE IN LEEDS

In 1983 poplar regeneration was observed on a patch of waste ground at a site in central Leeds, Yorkshire. Vegetation surveys carried out in other towns over the next eight years failed to reveal further examples and it gradually became clear that this was a most unusual occurrence. A literature search revealed only one other incidence in the UK; this involved different poplar taxa at a sewage works at Hackney, East London (Wurzell 1985). During 1991 the Leeds population, which is now very well established, was investigated in more detail.

The parents, which are growing on a traffic roundabout at the junction of Kirkgate and Crown Point Road, are 20 well grown specimens of the Balsam Poplar (*P. candicans* Ait., all female) and two similar sized Black Poplars (*P. nigra* L., both male). The origin of *P. candicans* is unknown; it may be a hybrid between *P. balsamifera* L. and *P. deltoides* Marshall and, if so, the regeneration could well be tri-clonal, a most unusual occurrence. The large quantities of seed which are shed in late June collect as piles of white 'fluff' wherever there is a little shelter. Following rain, they germinate within 24 hours to produce extensive, dense swards of seedlings with dark blue-green elliptic cotyledons. Most of these are subsequently killed by drought. In many years however a number survive, particularly where the substrate contains fine material. This has led locally to very dense stands of uneven aged young poplars up to several metres high; hundreds of individuals are involved.

The community they are invading is typical of dry, brick rubble demolition sites all over the country (Gilbert 1989). Leading herbaceous species are *Agrostis stolonifera* L., *Artemisia vulgaris* L., *Chamerion angustifolium* (L.) Holub, *Poa annua* L., *Senecio squalidus* L. and *Taraxacum officinale* Wigg. which provide an open vegetation into which woody plants such as *Buddleja davidii* Franchet, *Fraxinus excelsior* L., *Malus domestica* Borkh., *Salix caprea* L., *Sambucus nigra* L. and the poplars readily self-seed. The only remarkable feature of the vegetation is the presence of the poplars, now up to 3 m high and visually dominant. The climate of Leeds is not unusual in any way and open, competition-free conditions are a universal feature of urban areas so the reason behind this regeneration episode is enigmatic.

The hybrid plants are too young for features such as canopy shape, sucker development or trunk morphology to be assessed, and to date none has flowered so their sex is unknown. However it is already clear that they show a greater range of variability in leaf characters than either parent. A hundred leaves were collected from strong shoots of each parent population and compared with a similar number from the progeny (Table 1). The results suggest that by using combinations of leaf characters it should be possible to identify populations that have arisen as hybrids between the black and balsam poplar. The range of variation in leaf characters is wider than in either parent: the mean expression of this variation is intermediate between that shown by the parents and new characters are present such as the subpallid colour of the underside of the leaf (34%), rounded leaf base (20%) and subacute leaf tip (17%). The variability of the parents needs to be fully understood before such determinations are made (see Jobling 1990).

The opportunity was taken to investigate seed viability which is reported to drop to zero after only a few days (Brendell 1990). A large sample of seed, collected from bursting capsules on 29 June 1991, was stored in daylight at room temperature. Initially, then at seven day intervals, subsamples of c. 200 seeds were moistened and placed on damp filter paper in a petri dish. Germination occurred within 24 hours but the dishes were left for seven days before being scored. The results

TABLE 1. A COMPARISON OF THE CHARACTERS OF *POPULUS NIGRA*, *P. CANDICANS* AND THEIR HYBRIDS

Character	<i>P. nigra</i>	Hybrid	<i>P. candicans</i>
Leaf shape	Triangular 80% Diamond 20%	Triangular 28% Diamond 39% Ovate 26% Heart-shaped 3% Elliptic 4%	Heart-shaped 80% Ovate 20%
Leaf base	Cuneate	Cuneate 80% Rounded 20%	Cordate-subcordate
Leaf tip	Acute through acuminate to cuspidate	Acute through acuminate to cuspidate 83% Subacute 17%	Acute through acuminate to cuspidate
Colour of underside	Green	Green 31% Pallid 35% Subpallid 34%	Pallid (whitish)
Serration	Crenate	Crenate 52% Serrate 47% Entire 1%	Serrate
Gland(s) at top of petiole	Absent	Present 52% Absent 48%	Present 68% Absent 32%
Hairiness of petiole	Hairy 80% Subglabrous 20%	Hairy 49% Subglabrous 4% Glabrous 47%	Subglabrous 84% Glabrous 16%
Cross section of petiole*	Flattened	Flattened 25% Rounded 75%	Rounded
Scent of unfolding foliage	Unscented	Scented to some extent	Balsamic

* This character was difficult to assess.

showed that a germination rate of 80% is maintained for the first week, after a fortnight it had dropped to 25%, after three weeks to 1%, and after five weeks to zero. In this instance it would be correct to record that germination dropped to zero after a few weeks.

At the London site, where hundreds of selfsown poplars have established at two adjacent disused sewage works (the Middlesex and the Essex Filter Beds) ecological conditions are very different. Here the substrate is mud in the bottom of seasonally waterlogged lagoons. The parents involved are two varieties of black Italian Poplar which have crossed to produce abundant regeneration of the hybrid *P. × canadensis* Moench 'Serotina' (male) × 'Marilandica' (female); the former has also crossed with Balsam Poplar to produce the hybrid *P. × canadensis* 'Serotina' (male) × *P. candicans* Aiton (female).

These examples from Leeds and London are the only recorded instances of alien hybrid poplars, which are usually present as single sex clones, regenerating in Britain and are a further example of how new taxa, with their dispersal centre in urban areas, are being added to our flora. In the Ruhr district of Germany, I have observed that Black Poplars and Balsam Poplars hybridise freely, their progeny are a conspicuous feature of dry urban wasteland sites in industrial areas. It would appear that unlike Black Poplar regeneration, which is currently limited by a lack of suitably muddy germination sites (Milne-Redhead 1990), regeneration involving alien poplars may be controlled by the chance juxtaposition of compatible genotypes.

ACKNOWLEDGMENTS

I am grateful to E. Milne-Redhead for confirming the identity of Black Poplar and to B. Wurzell and A. Beaton for useful discussion.

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SEXUAL DIMORPHISM IN *ERIOPHORUM VAGINATUM* L. (CYPERACEAE)

In Britain, *Eriophorum vaginatum* L. is one of the major dominants in ombrotrophic mire vegetation and comes into flower in early spring, before most other bog species. On 22 March 1991, we had an opportunity to observe its floral characters in a central part of Borth Bog (Cors Fochno) in Cardiganshire (v.c. 46), one of the largest intact raised mires in Britain. Tussocks of *E. vaginatum* are a prominent component of the vegetation at Borth Bog, so there was an abundance of material on which to make observations.

The florets of *E. vaginatum* are wind-pollinated and strongly protogynous. Following pollen liberation, anthers are shed leaving the more persistent filaments protruding from the glumes. Eventually, the filaments too are abscised, and the perianth bristles elongate rapidly and massively to form the familiar cotton-like heads which aid seed dispersal.

What seemed curious about the floral biology of *E. vaginatum* at Borth Bog was that no stamens were visible on the flowering spikes of some tussocks, even though they were at the appropriate ontogenetic stage, with withered stigmas on the one hand and no sign of remnant filaments or developing 'cotton' on the other. Suspicion that these plants were male-sterile was confirmed by closer inspection; three tiny vestigial stamens, or staminodes, were clustered around the base of the

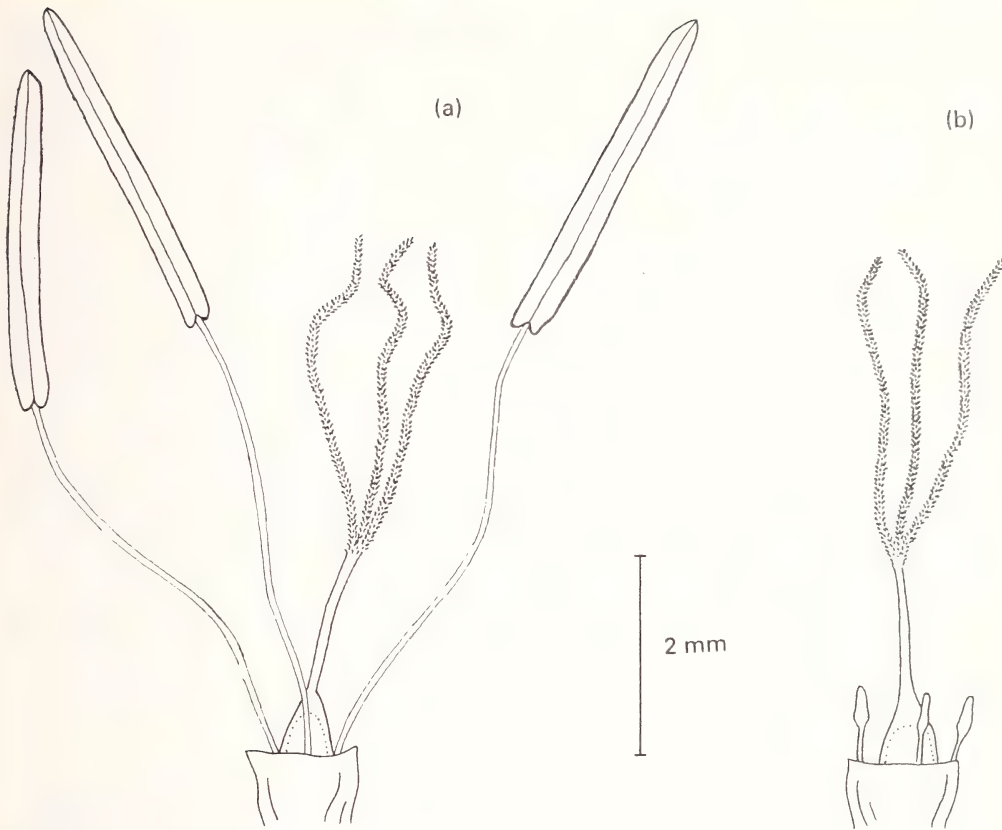


FIGURE 1. Flowers of *Eriophorum vaginatum* collected from Borth Bog in March 1991: (a) hermaphrodite; (b) male-sterile (glumes and bristles removed).

ovary in every floret. These staminodes were clearly non-functional, with minute, empty, non-dehiscent anthers, white or brown in colour, on filaments which had failed to elongate. The striking difference between these structures and those of male-fertile plants is illustrated in Fig. 1.

Several male-sterile and male-fertile tussocks were examined in the field, and no variation in stamen development was detected, either within or between inflorescences on the same tussock. However, no thorough search for plants of intermediate phenotype was carried out. Similarly, no attempt was made to assess the abundance of male-sterile tussocks on 22 March 1991, but they were obviously frequent in the study area. No marked ecological separation of the two sex phenotypes was apparent.

We re-visited the same section of Borth Bog on 21 June 1991 to see whether the two phenotypes were setting seed. It was past the optimum time to make such an assessment as fruiting spikes were disarticulating. Sexing had to be carried out with great care because staminodes were being shed from male-sterile florets, as were remnant filaments from male-fertile spikes. Many of the remaining intact fruiting heads of both phenotypes were barren. However, several florets in both male-sterile and male-fertile spikes were found to contain ripening nuts. It appears therefore that the Borth Bog population of *E. vaginatum* is gynodioecious (*sensu* Darwin 1877), with co-existing female and hermaphrodite tussocks.

The only previous record of sexual dimorphism in *E. vaginatum* of which we are aware was reported in a talk on pollination and seed dispersal in Danish Cyperaceae given by the eminent botanist C. Raunkiaer to the Botanical Society of Copenhagen at a meeting on 14 May 1892

(Anonymous 1893). Raunkiaer stated that he had found *E. vaginatum* to be completely gynodioecious on a small island in the Hvalsølle Sea; unfortunately, no further description of the sexual characteristics was transcribed. Male-sterility has been reported for other species of *Eriophorum* by several authors, including Dickie (1865) and Knuth (1906), but not for *E. vaginatum* by Wein (1973).

Further investigations into the distribution of gender in *E. vaginatum* and other British cottongrasses are in progress.

ACKNOWLEDGMENT

We thank Anna Williams for translating the account of Raunkiaer's talk.

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CORYNEPHORUS CANESCENS (L.) BEAUV. (POACEAE) ON THE WEST COAST OF SCOTLAND

There are three records between 1895 and 1961 of *Corynephorus canescens* (L.) Beauv. on the Morar coast. In 1948 R. C. L. Burges collected "on sands one and a half miles south of Morar", Westernness v.c. 97 in E. If this distance is stretched a little, is there similarity between this record and that of S. J. P. Waters, 1961, "sand dunes by Camusdarach" which is slightly more than 3 km by road from Morar? Or is it more likely that the Burges record refers to the earliest known site at Toigal which by road is 2.5 km south of Morar? This site of *C. canescens* was found by F. Townsend, as *Weingaertneria canescens* Bernh., on "Sand Dunes by the sea between Morar river and Arisaig, Scotland, July 1895", in herb. Druce, OXF with duplicates in CGE, E. K and LIV. There has been no further report of this site, except the reference to Burges above, until 24 July 1991 when Alfred Slack, Elizabeth Norman and John Trist found the remains of the colony.

Beeby (1897) reported that one Eneas R. Macdonnel of Morar introduced *C. canescens* to this site; but this 'introduction' is Beeby's interpretation of Macdonnel who *in litt.*, 1896 to Townsend wrote "it is not indigenous but was introduced direct here and not by accidental admixture". This does not imply that Macdonnel introduced either seed or plant.

In 1991, after a thorough search of the dunes, we found a single plant of *C. canescens* within the area described by Townsend. He reported to Beeby (1897) that "the grass occurs in plenty on the sand-hills". At Morar the dunes are highly mobile and bare of vegetation except for *Ammophila arenaria* (L.) Link, which is largely confined to the crests, and a little *Carex arenaria* L. At the site of the single *C. canescens* there was one plant each of *Aira praecox* L., *Rumex acetosella* L. and *Carex arenaria* which were within 10 m of a small dune crested with *Calluna vulgaris* (L.) Hull.

Marshall (1967) reports that *Corynephorus canescens* is a plant of substrates which are extremely low in mineral nutrients, and this is true of this site at Toigal, which showed available phosphorus 4 mg/l⁻¹, potassium 9 mg/l⁻¹ and magnesium 7 mg/l⁻¹. These values are very low and would offer minimal plant nutrition.

The pH of the Toigal sand is high at 8.3. It was treated with dilute hydrochloric acid and shown to have no calcium carbonate present, indicating that there must be another source of calcium. This was confirmed by the detection of ammonium acetate extractable calcium in moderate quantity.

This sand consists of multi-faced subangular particles of quartz, some of which are transparent, opaque and ferruginous; minute black particles of a mineral are also present and may represent 1–2% of ferro-magnesian minerals.

The instability of these dunes has probably been a major influence in the past history of this *Corynephorus* colony. Consideration may also be given to Marshall (1967) who has shown that this taxon can thrive in a wide range of pH (3.7–8.5). Perhaps in this case we should only regard the high pH value as one of several factors which have influenced the gradual decline of this grass colony.

C. canescens has a shallow rooting system of 7.5–10 cm in depth (Marshall 1967). In this site on the coast it is subject to high winds which puts further stress on the sand to retain moisture. However this area has an annual rainfall of c. 1500 mm (Met. Office 1991) which to some extent will offset the disadvantages of a medium which lacks moisture storage. *C. canescens* grows best where up to 10 cm of sand accretion per year takes place though Marshall points out that where this exceeds 2 cm at germination too much sand may be trapped and seedlings are smothered. Even in this event some young plants may survive which have not germinated from seed and which owe their existence to vegetative internodal growth.

Rabbits may have contributed to the decline. The single plant of *C. canescens* of 1991 had twelve culms of which only three panicles survived the rabbits. Reference has been made to the sparse vegetation of the dunes which would not attract rabbits. There are no rabbit-grazed swards about the dunes but they are found around the settlement. As rabbits have probably been present here for a long time, it would be difficult to assess their part in the decline of the *C. canescens* colony which has survived for 97 years and now appears to be reduced to a single plant.

ACKNOWLEDGMENT

I thank Dr Bryan Davies for soil analysis and guidance in unfolding the calcium source.

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Book Reviews

The correspondence of Charles Darwin. Vol. 7: 1858–1859. Edited by F. Burkhardt & S. Smith. Pp. xxxv + 671. Cambridge University Press, Cambridge. 1991. Price £35 (ISBN 0–521–38564–4).

463 pages of this volume are taken up with the correspondence during the dates given; a further 34 pages record letters located or re-dated since the publication of *Correspondence* vols 1–6 (covering the years 1821–1857). The eight appendices include a chronology, an abstract of Darwin's theory of natural selection and a copy of Wallace's 'On the Tendency of Varieties to depart indefinitely from the Original Type', which forced Darwin's hand into publishing the *Origin*. Of the other appendices, one concerns a memorandum to H. M. Government about the status of the nation's premier natural history collections vis-à-vis the British Museum – plus ça change . . . In addition, there are comments on the manuscript, a bibliography, a biographical register and an index.

Of course, the nub of this volume is Darwin's preoccupation with his book *On the Origin of Species by means of Natural Selection*, the publication of which (1859) had to be brought forward as a result of Wallace's letter from the island of Gilolo in the Moluccas. As ever, there is much correspondence with his friend Joseph Hooker and his mentor, Charles Lyell, which reveals Darwin's doubts about rushing into print over his theory – would that some modern workers might so reveal their innermost feelings about their pet ideas. Nor does Darwin seek succour solely from his great contemporaries; many of his letters seek information on points of detail from a host of less noteworthy correspondents.

Apart from the scientific 'dynamite' enshrined in this correspondence, however, the reader continues to be given access to a view of a stratum of Victorian life scarcely touched upon by Dickens, for example. Nevertheless, the death, from scarlet fever, of his youngest child, Charles Waring, at the age of two years is a reminder of the universal perils of the age. The agony of this event, revealed in a letter to Hooker, is counterpointed by a letter to Darwin's eldest child, William, about a younger (George) son's prowess at billiards.

With its revelations of the ways in which a great scientist arrived at one of the seminal biological theories of this or any other age, together with a view of the society within which such ideas developed, this volume is of widespread interest and value. It continues the feast of high scholarship which is epitomised by this distinguished editorial and publishing treatment of Darwin's *Correspondence*.

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Genetics and conservation of rare plants. Edited by D. A. Falk & K. E. Holsinger. Pp. xviii + 283. Oxford University Press, Oxford. 1992. Price £35 (ISBN 0–19–506429–1).

Rare species are on the increase; the public expects botanists, who have highlighted the problem for so long, to develop workable schemes that prevent the extinction of endangered species. This book, resulting from a 1989 conference convened by the Centre for Plant Conservation in St Louis, helps to ensure that such schemes have a strong scientific basis. The complementary approaches of 'off-site' and 'on-site' conservation are examined. Limited space is given however to the complexities of re-introduction.

Building on what is known of rare plant population biology, the book then considers methods for sampling, assessing and conserving their genetic variation. Finally the conclusions are drawn together into a set of practical guidelines for conservation programmes. One of the strengths of the book is that it calls on expertise in the fields of zoology, forestry and crop genetic resources. Here the authors have successfully focussed their expertise on the specific problems faced in conserving rare plants. It is a pity, however, that the chapter on germplasm management failed to emphasise such practical problems as 'empty' seeds in seedlots of wild species.

There are some very valuable contributions from leaders in the field of plant population genetics. Hamrick *et al.* point out the relative benefits of using morphology, isozymes and DNA studies in assessing genetic diversity. In these 'high tech' days, it is comforting to know that measurements on 'real' plants still have a valuable part to play in such assessment.

Not surprisingly, the book draws mainly on examples from the Developed World. In the Developing World, the ratio of botanists to species means that the biology and even rarity of a species is often not known. This makes development of conservation programmes difficult. Broad generalities help. Biodiversity within wet tropical forests will be best conserved 'on-site' (see contribution from Bawa & Ashton). In the dry tropics, however, where desertification threatens, long-term conservation may often only be achieved through 'off-site' activities. The broad statement on page 114 that tropical species' seed cannot withstand drying and cold storage is erroneous; many dry tropical species are quite amenable to seed storage. With the clock ticking, there will be little time left for detailed studies in many cases to determine the best conservation strategy. Indeed, many of these studies will only be possible once material has been taken into safe keeping in seed banks and botanic gardens; so by using the sampling guidelines given in this book we should conserve something now and worry about the precision of the approach later on.

In summary, this volume has been well edited, has a wealth of information bringing together some 850 references and has been produced to a high standard. A proportion of the book is accessible to the general reader; the more genetical elements might have been more so had a glossary been included. The book is an important step towards practical action. Botanists and conservationists will find it a useful addition to the literature.

S. H. LININGTON

The Hamlyn photographic guide to the wild flowers of Britain and Northern Europe. R. Gibbons & P. Brough. Pp. 336, including 163 pp. of colour plates. Hamlyn Octopus, London. 1992. Price £20 (ISBN 0-600-57452-0).

Here is yet another illustrated Wild Flower book, but this time it is hardly a field guide. Its size, 22 × 29 cm, is too large for most pockets, and its weight, 1.63 kg, is too heavy for most rucksacks after packing waterproofs, food, camera, etc. It must therefore be considered as an indoor reference book, as even a quick glance showed it to be more useful than the proverbial coffee table book.

After the general acknowledgments and bibliography are two pages of introduction and explanations on using the book, and two pages of glossary terms with diagrams. Then follow 320 pages with descriptions of over 1,900 species and 1,500 colour photographs, 1,000 distribution maps and more than 400 line drawings of important identification characters.

The text and illustrations are arranged according to the systematic order used in *Flora Europaea*, and with a few minor exceptions the nomenclature also follows *Flora Europaea*. Grasses, sedges and rushes are not included.

The distribution maps, text, line drawings and photo index on the left-hand page and 8–12 relevant photographs on the right-hand page do make reference easy. The photographs are lettered in a diagram of the plate layout, and the letter identifies the map, text and index of photographs. Where possible the English name is used in the marginal photographic index. Both the scientific and English names are given in the text.

On the whole the photographs are good. Some appear to have been selected to show important characters separating 'look-alikes' such as *Potentilla sterilis* and *P. micrantha*. It is a pity that a few photographs are enlarged more than other members of the same genus on the same plate. This could be confusing to a beginner, even though size may be given in the text. Two examples are the smaller species of *Cerastium*, and *Sedum villosum* is so much smaller than *S. telephium*.

The distribution maps, though of necessity tiny, are an added interest and the colour codes give an idea of the status of the species where it does occur. The area covered is about the same as in previous Floras of Britain and Northern Europe.

The line drawings are necessary for some species as even good photographs cannot show smaller critical features, but there is space in the margins for a few more. A beginner with an unknown flower and no knowledge of plant families will be faced with the daunting task of turning page after

page in search of a photographic match. There is no key, but descriptions of families appear in systematic order in the text and species in the larger genera are grouped under headings of similar characters. The last six pages contain a combined index of English and scientific names, which makes for easy reference.

A few errors are inevitable in such a work, but the index has over 20 omissions.

While I find the book too large and heavy for use in the field, I certainly enjoy the photography and find the distribution maps interesting, though a few do not agree with the distributions given in the text.

V. GORDON

Bob Press's field guide to the trees of Britain and Europe. J. R. Press; photographic consultants E. & D. Hosking, artwork by M. Tebbs. Pp. 247, with numerous colour plates and black and white illustrations. New Holland, London. 1992. Price £17.95 hardback (ISBN 1-85368-103-2); £9.99 paperback (ISBN 1-85368-104-0).

Field guides are a popular theme for publishers, and this is a fine example of the category. Richly illustrated with colour photographs and line drawings, in a format which allows the inexpensive production of versions in other languages, and with enough information to allow a reasonable chance of successful tree identification, this book is likely to prove very popular. The simplicity of style is similar to that of Oleg Polunin's, but Bob Press has been able to use the pick of the photographic agencies rather than relying mainly on the work of one person.

The coverage of tree species is wide, with over 450 species treated; native and naturalised species are given equal emphasis, with all the main species illustrated by at least one colour photograph. Line drawings in the left hand margin emphasise smaller features helpful for identification, and there is a short glossary of terms. Keys are in two forms: a numbered dichotomous key relying on both foliar and floral characters, and a synoptic key based entirely on leaf characters. The 52 families are described briefly in the introductory pages, facilitating comparisons and avoiding interruptions to the text. Text descriptions include a rather generalised indication of the distribution of the tree in Europe, followed (for naturalised species) by an indication of their country of origin. There is an appendix with information on arboreta, and a short bibliography. Separate indexes to common names and scientific names are provided.

The high quality of reproduction of colour photographs now achievable by modern publishers is well displayed in this inexpensive book, which was printed in Singapore. Taxonomically up-to-date, and concisely written, the book is unfortunate only in its title. Why, in 1992, does a publisher choose to refer to "Britain and Europe"?

J. R. EDMONDSON

Biology of plants. 5th edition. P. H. Raven, R. F. Evert & S. E. Eichhorn. Pp xvii + 791; lavishly illustrated. Worth Publishers, New York. 1992. Price \$59.95 (ISBN 0-87901-52-2).

This substantial book is the latest in a long tradition of all-embracing introductory Botany textbooks. It is a marvellous introduction to botanical science, with a well organised and very readable text supported by excellent diagrams and photographs, almost all in colour, on nearly every page.

Biology of plants has 31 chapters divided into six sections covering cell biology, genetics, diversity, anatomy, physiology and ecology. Scattered throughout the book there are also essays, separated from the main text, discussing topical themes such as 'The Great Yellowstone fire' or 'Jobs versus owls'. The level of treatment is generally aimed at the first year university student, and is designed primarily for its North American home market. This is only really noticeable in the chapter covering vegetation types, which perhaps leans too heavily on North American case histories to the exclusion of more representative examples elsewhere in the world.

As would be expected, recent advances in plant physiology and molecular biology are well

covered, but there are also some interesting reinterpretations of long-known phenomena; for example, the 'infection' of grasses by ergot is now seen as a partnership in which the grass receives protection from herbivores by the toxic fungus.

My main criticism of the book concerns the authors' definition of what is a plant. They exclude algae from their Kingdom Plantae, leaving only the bryophytes and vascular plants. The green algae are thus separated from their descendants, and giant kelps are left as odd bedfellows to the unicellular Protista. Despite this divorce, the actual coverage of the algae, as well as the more traditional 'non plants' – viruses, bacteria and fungi – is one of the most comprehensive of any introductory textbook I have seen.

At around £40 for 800 pages *Biology of plants* is an excellent value textbook from A-level onwards, but it would be a shame if its only audience were students. It is an excellent introduction to the world of plants for anyone, and with superb plant paintings by Rhonda Nass and a beautiful cover, courtesy of Van Gogh, it might even find its way on to one or two coffee tables.

A. S. GUNN

British plant communities. Vol. 2: *Mires and heaths*. Edited by J. S. Rodwell. Pp. x + 628. Cambridge University Press, Cambridge. 1991. Price £95 (ISBN 0-521-39165-2).

In 1989, I was, for all too brief a period, the last appointed Chief Scientist of the Nature Conservancy Council (R.I.P.). While in the post, however, my most pleasant task was to bring the National Vegetation Classification to its triumphal climax as a manuscript to be transmitted to the publishers, Cambridge University Press. Last year I saw with pleasure the first volume (reviewed in *Watsonia* 19: 49, 1992). Unlike volume 1, which dealt with woodlands and scrub, this second volume is a truly 'British' volume, in that it deals with vegetation that is centred on Britain, and which makes Britain special. Here is a tremendous compendium of information on mires and heaths – long needed, but it will also be long used.

The format seems well suited to the task. The community descriptions do not lend themselves readily to review, except for the passing comment that they are very thorough. The separate introductions to mires and heaths are well crafted, and excellent synopses, although there are some dense passages. For example, "The perspective looking towards the Continent from our own generally oceanic standpoint is rather different from that hitherto proclaimed as normative from the opposite direction" (p. 350).

At 38 plant communities, one might query if the mire classification were not too fragmented. The difficulty of identifying homogeneity in mire vegetation, as well as the variation in substrate and climate across Britain, all contribute to mires being such rich systems, and explain why so many units are described. I found the 'block' diagrams gave an instant clarity of view for ecological position. The discussion of the changing community context of *Schoenus nigricans* is also of interest to illustrate that communities are but spatial and temporal kaleidoscopes of species. But here is also a weak spot – for it would be marvellous to see that discussion set in a broader context of Ireland and the western fringe of Europe north and south. Given the 20 year support from the (J.)N.C.C., and the fact that they have an international branch, it would be good if future volumes could take a wider view. Even if that is not possible, I hope someone will eventually fund and produce a synthesis of British plant communities in their European context.

With regard to heaths, the point is well made that without appropriate management heaths become very hard to distinguish, and tend to a uniform Callunetum; which has clear conservation implications. It also underlines the very dynamic nature of these communities. Again, the introductory description is sound, and the block/circle diagrams are helpful to explain lines of variation. However, I believe it is simplistic to suggest that lowland dry heaths are a linked circle; for my money there are two clear groups corresponding to the Ulicetalia minoris and Vaccinio-Genistetalia, as discussed by Bridgewater (1980) in *Phytocoenologia* 8: 191–235. The Ulicetalia minoris is a southern and western order and the Vaccinio-Genistetalia an eastern and northern order, with some overlap between.

Boundaries between wet and dry heaths probably deserve more discussion throughout the volume. So too does the position of *Erica ciliaris* heaths, which are given rather short shrift in this

current treatment. The associations *Ulici gallii* – *Ericetum ciliaris* and *Ulici minoris* – *Ericetum ciliaris* described by Bridgewater in 1980 I still regard as valid, but vegetation represented by these associations is not even accorded variant status in this current work. Others will be able to test these different views – provided it is done in a fully European context. As the author says (p. 13) “For the classification is meant to be not a static edifice, but a working tool for the description, assessment and study of vegetation”. Indeed, I sincerely hope that one by-product of the series will be an increase in phytosociological papers in the British journals, as well as the expansion of British papers in the continental ones.

Keys are provided for both mires and heaths. Do they work, and are they worth the effort? I used them with sample data collected during the last three years. The results? Success every time, despite some rather obscure wording of the couplets.

This is a book any botanist interested in phytogeography and vegetation will want to buy. And so here is my biggest gripe, aimed not at the superb work done by the contributors, but at Cambridge University Press. Having hired excellent and far-sighted editorial staff to secure works like this for their list, why then price them out of most libraries’ reach, let alone interested botanists? If I want to buy the book here in Australia, the price is \$325!

But enough of gripes – this work is elegant testimony to those who developed the concept, and participated through the years, but especially to John Rodwell who has the fortitude to have ridden out the all-too-many rough patches, when it seemed the end would never come. And from my personal knowledge, Lynne Farrell, once of the N.C.C. and now English Nature, did an excellent back-room job, steering it through the shoals of Government bureaucracy. We should all look forward to the third volume.

P. B. BRIDGEWATER

FLORA: The Computerised key to 786 species of British wild plants, version 1.10. Poly Enterprises Plymouth Ltd, Seale Hayne Faculty, Polytechnic South West. Newton Abbot. 1992. Price £99.88, with discount for multiple copies.

Recent years have seen a great increase in general use of computers and botanists have been quick to explore the possibilities to which computer technology can be put to aid their studies. Several programs have been developed with the naturalist in mind, building databases for use in plant recording, mapping, etc., and some have delved into the realms of plant identification. Computer aided keys have appeared for specialist groups (e.g. sedges and orchids), but *FLORA* is the first published attempt at a general usage computerised key to British flowering plants.

The *FLORA* package contains a disk (with the databases and program), a User Instruction Manual and a botanical reference manual. Once loaded on to the hard disk of your machine (taking up a tiny 260K) the menu-driven program enables plants to be identified using a multi-access approach, with a total of 48 possible characters to choose from. Characters are grouped into categories, according to the approach of the user. Three general categories (primary, secondary and tertiary) hold groups of characters in descending order of their usefulness in identification. The characters are also grouped into categories relating to the flower, leaf, stem or environment. In general, identification begins in the primary category, and character states are entered against those characters evident from the specimen. For novices to the program there is a ‘beginners tour’ leading you through all the characters in the primary category showing all their possible states. When a few characters are entered the database can then be usefully searched for matches. The program sorts through the database and the species are listed in descending order of likelihood. If need be you can return to the category summary tables and enter more character states until the search gives a fewer number of possibilities. At this stage you are advised in the instructions to turn to other botanical reference books for descriptions and pictures.

Having used the program myself, and enlisted the help of others less experienced in plant identification, I have found that the program is relatively easy to use, and generally successful. The authors claim that as few as six characters need to be entered to effect an identification. My experience is that unless you know which characters will narrow down the field quickly you will probably have to key in considerably more. This leads me into my first criticism of the program, the

lack of on-line help facilities. It would be very useful to be able to list the characters that will differentiate effectively between your shortlist of species, and thereafter concentrate your efforts.

With the great diversity in plant form across the families it is very difficult to produce a general list of characters and their states that will deal with all species in a satisfactory manner. The writers of *FLORA* have had to simplify this variation, and on the whole they have produced a workable system, and have tried to avoid using technical terminology. There are some rather odd character states; for example *Rumex* flowers are described as 'grass-like', and the character 'leaf venation' not only caters for parallel, pinnate and palmate venation but also for succulence and compound leaves. In order to save storage space and to increase compatibility with non-graphics supporting computers, the writers have decided not to include illustrated help screens, but rather to rely on the botanical reference manual. Even allowing for the promised reprint (initial problems with printing have left many of the drawings faint and some unusable) the booklet does not to my mind clearly define the characters and this has led to mis-scoring of characters when testing the program (in the botanical reference manual the same leaf shape, obovate, is included in both 'paddle' and 'oval' character states).

As with many partial Floras this program falls down in its depth of coverage. Grasses, sedges, rushes and gymnosperms are excluded, and critical groups (e.g. *Euphrasia* and *Salix*) are treated as aggregates. Looking at some of the datasets used there are an alarming number of missing data for the species included. This leads to problems when separating some of the species. Although much of the terminology is non-technical, a certain degree of botanical knowledge is required to operate the program and sort out errors of scoring that frequently arise. I can see the potential for this program in schools and field centres (particularly with the educational discount price) where it could be used to encourage children to look at and identify plants. If *FLORA* was considerably cheaper then I could see more botanists buying a copy, but at the quoted price most field botanists would be better advised to invest in one (or two!) of the full Floras of the British Isles.

M. F. WATSON

Obituary

JOCELYN MARY LEWIS RUSSELL
(1905–1992)

Jocelyn Russell, the able, lively and lovable personality, died on 14 May 1992, aged 86. She was born at Ockham, Surrey, on 28 December 1905, the only child of Walter Lewis Castelden and Charlotte Mary Katherine, née Thring, who died very shortly after. So, Jocelyn was brought up until she was four by a sister of her father – who came from Canterbury and managed Henderson's Transvaal Estates. By his second marriage he had four children, to the youngest of whom, Mrs Joanna Huntingford, I am greatly indebted for many details. He died in 1953.

From 1921 to 1923 Jocelyn was sent to the Godolphin School at Salisbury, where her contemporary was another enthusiastic botanist, the late Mrs Barbara Garratt. This was followed by an art school and work in her father's office. On 1 January 1935, she married Basil Henry Sackville Russell and they lived in Manchester, Portugal (1937) and the Belgian Congo (where he was employed by Vacuum Oil), before returning to England at the outbreak of World War II. Basil, later a Squadron-Leader, joined the R.A.F.V.R. and Jocelyn the Mechanised Transport Corps.

After the collapse of France, her unit was drafted to the Middle East, joining in January 1941, at Cairo, the Free French Forces with the British 8th Army. As those will know who saw the television programme on 29 March 1989 (filmed 18 months before) "Tin Hats and Silk Stockings", she also painted wild flowers when she was out there. Some 40 of these, dating from 1941 to 1944, with names and localities, were on show at the Centenary Exhibition at Kew in 1953, who said they made a very fine display and asked if they could eventually be returned there. Many were made at Bir Hukayyim, where the battle raged for a fortnight in 1942. She made a notebook (which was shown on the TV programme) grouped by families, of 115 of the plants she saw during the time before she got to Tunis. For each she wrote out a full and detailed account with a clear, characteristic coloured drawing. This material has also gone to the Royal Botanic Gardens, Kew.

Her arduous tour lasted four years and three months, from Syria to Tunis, then into Italy and southern France; and her stalwart service was rewarded on 19 July 1944, with the French Colonial Medal with clasp 'Libye' and on 20 June 1945 with the clasp 'Tunisie', and on 16 April 1947 with the Croix de Guerre avec étoile en bronze. The citation included "A participé à toutes les campagnes, faisant des liaisons aux postes avancés. A notamment assuré dans les combats de Tobrouck, le ravitaillement en eau de la formation, malgré les mitraillages et les bombardements de l'aviation ennemie, a continué ces missions de liaison avec la même succès et la même intrépidité"; and on 27 July 1947 the Commemorative Medal of the Free French Forces.

While she was in Tobruk, she learnt that her husband, dropped by parachute from a flying boat in Sumatra in 1942, shortly after meeting her in Cairo, was missing, presumed killed. Meanwhile, she had met Constance Spry, the flower arranger, who appeared one day in her tent in Africa and offered her a job after the war. This developed into a close friendship, Jocelyn travelling widely in her Rednose cars, demonstrating the art. She even did Prince Philip's private bouquet for Princess Elizabeth on their wedding day, which she delivered personally in her Morris 8 to Buckingham Palace.

Although she had been keen on flowers ever since she was a child, she learnt of the Wild Flower Society only by chance when she was 43. She joined the B.S.B.I. the following year, 1950, and the London Natural History Society in 1951. Thereafter these led her dominant interest in wild flowers, she contributing every bit as much as she learnt, sending records to various Floras and the like. Not surprisingly she rapidly took a leading part. For our Society she gave long service to the Meetings Committee (1953–70), the Conservation Committee (1964–78) and the Council. She was a Vice-President from 1976 to 1980. For the Wild Flower Society she held various posts, not the least being her founding, in 1957 of the Branch 'Parnassus', the highest refuge for top members, running it until 1986.

Two of her discoveries were *Dichondra micrantha* in 1955, naturalised near Hayle in Cornwall

Among the papers of this eager searcher are her notebooks from 1951 to 1968, detailing where to find all manner of scarce, rare and very rare plants (and she had seen the rarest of plants, including *Epipogium aphyllum* quite soon after it was rediscovered). There are others with copious notes on what she found on her trips, often with itineraries which are now in the Natural History Museum. These drawings and photographs show that she botanised at least in Scotland (1950–55, 1958, 1968, 1974–5); Wales (1952, 1954, 1956–7, 1968); Ireland (1952, 1954, 1958, 1967); Jersey (1954, 1956–7); Guernsey (1956–7); Alderney (1956); Herm (1958); France (1946, 1950, 1958, 1963–5); Andorra and Pyrenees (1963); Portugal (1968); Italy (1944–5, 1963–66, 1972); Austria (1964); Switzerland (1964–8); Norway (1963); Greece; Turkey (1976); and South Africa (1969). She was in touch with, and often close friends of, many of the leading botanists' professional and amateur.

She was a skilful photographer, the evidence being in box after box, at least ten of them filled with 2×2 slides, these going similarly to the Natural History Museum and Royal Botanic Gardens, Kew.

Bald facts such as all these give no impression of the warm, exuberant, cheerful companion she was, with infectious enthusiasm. What a lot of good she did to, and for, many of us. There are accounts of her in the *Wild Flower Magazine* Nos. 341, for September 1954, 407 for Autumn 1986 and 425 for Autumn 1992.

D. McCLINTOCK

Report

ANNUAL GENERAL MEETING, 9 MAY 1992

The Annual General Meeting of the Society was held in the Jodrell Laboratory Lecture Theatre, Royal Botanic Gardens, Kew, at 10.45 a.m. 74 members were present. Dr P. Macpherson, President, taking the chair, welcomed members, particularly any who had joined in 1991 or who were attending their first A.G.M.

Apologies for absence were read and Minutes of the 1991 Annual General Meeting, published in *Watsonia* 19: 67–71 (1992), were approved and signed by the Chairman.

REPORT OF COUNCIL

The adoption of this report, which had been circulated to members, was proposed from the Chair. Mr R. G. Ellis noted that the speciality of the late member Mr M. C. Clark was mycology, and with this amendment the Report was accepted unanimously.

HON TREASURER'S REPORT AND ACCOUNTS

The Hon. Treasurer, proposing the adoption of his Report and Accounts, which had been circulated to members, highlighted the B.S.B.I. Database (Leicester), for which the hardware, at an expenditure of £6,000, was now in place. Mr Walpole acknowledged with thanks the hard work of our members and staff at the University of Leicester, whose enthusiasm had ensured the successful input of the initial project, the *List of vascular plants of the British Isles* by D. H. Kent which was now ready for publication. The Treasurer also commented on the small number of resignations in spite of a rise in the subscription rates this year, and he invited queries on the accounts. There being none, the Report and Accounts were accepted unanimously.

RE-ELECTION OF HON. GENERAL SECRETARY AND HON. TREASURER

Proposing the re-election of these Officers the President stated that the Society was fortunate to have two such hard-working Officers, thanking Mrs Briggs for tackling with good humour the continual flow of mail, the administration, and the dispersal of information including regular notes in *B.S.B.I. News* which informed members of the Society's activities and projects. He also thanked Mr Walpole for his hard work on the finances, including the V.A.T. and the Accounts, and for his wise counsel on Committees and Council. Both were then re-elected with acclaim and applause.

ELECTION OF COUNCIL MEMBERS

In accordance with Rule 10, nominations had been received for Mr F. Horsman, Mrs A. Lee and Mr P. Thomson. Profiles had been published with the Annual Report and these members were elected unanimously by the meeting.

ELECTION OF HONORARY MEMBERS

Council had nominated two members: proposing Mr J. F. M. Cannon, Dr N. K. B. Robson outlined Mr Cannon's long years of service to the Society as a past-President, as a member of three of the

Permanent Working Committees, and also as a general Umbelliferae referee. On the staff of the Natural History Museum, Dept. of Botany, and later as Keeper of Botany there, Mr Cannon was closely connected with B.S.B.I. activities centred at the Museum (the official address of the Society). Proposing Mr E. S. Edees, Mr A. Newton had sent a note which was read to the meeting reminding us that Mr Edees had been a member of the B.S.B.I. for 60 years, and v.c. Recorder for Staffs. for 35 years. Author of *Flora of Staffordshire*, the first county Flora to be based on tetrad mapping, and joint author with A. Newton of *Brambles of the British Isles*, Mr Edees had also been a *Rubus* referee for more than 30 years, and his nomination was strongly supported by the local botanists in Staffordshire. Their election as Honorary Members was unanimous and greeted with applause.

RE-ELECTION OF HONORARY AUDITORS

The Hon. Treasurer, in proposing the re-election of Grant Thornton, West Walk, Leicester, referred again to the honour for the Society to present their Accounts over the name of these distinguished Auditors, and the re-election was passed unanimously with appreciation.

ANY OTHER BUSINESS

The Hon. Treasurer added thanks to the Secretaries and Chairmen of Committees, and all who had assisted with the running of the Society's affairs; and as Chairman of the Publications Committee he warmly thanked the Editors of the Society's Journals and publications, whose considerable work was very much appreciated by the Society.

The President announced that Council had nominated Dr F. H. Perring as President-elect 1993-5 for election at the Annual General Meeting, 1993. Dr Perring replied that he was deeply honoured and that he would take up this office with serious commitment.

On behalf of the Society the President recorded congratulations to Professor C. A. Stace on the publication of his *New Flora of the British Isles*, an achievement in which we could share in that the author's published thanks listed many B.S.B.I. members, and he had also acknowledged the Society as "a great source of inspiration to him". General appreciation was confirmed by the applause of the meeting.

The Hon. General Secretary was seeking help with the heavy burden of the administration and correspondence and those present were requested to let her know of any volunteers.

There was no other business and the meeting closed at 11.15 a.m.

MARY BRIGGS

PAPERS READ AT THE ANNUAL GENERAL MEETING

Two papers were presented at the A.G.M. Dr P. Macpherson gave the Presidential Address on *Colonisation of the Glasgow Garden Festival site three years on: implications for recording* (see *Watsonia* 19: 169-179) and Professor G. Ll. Lucas spoke on *Plant management for conservation purposes*.

Thanks were recorded by J. Ounsted and P. S. Green, Vice-Presidents, to Professor G. T. Prance, Director, Royal Botanic Gardens, Kew for permission to use the Jodrell Laboratory, and to the President and to Professor G. Ll. Lucas for their Address and Paper.

The President then thanked all those involved in the arrangements for this successful meeting, especially Dr D. A. Simpson, who with Mrs R. Simpson had organised the bookings and refreshments, and who with Mr P. C. Boyce had guided members on tours round the Gardens in the afternoon.

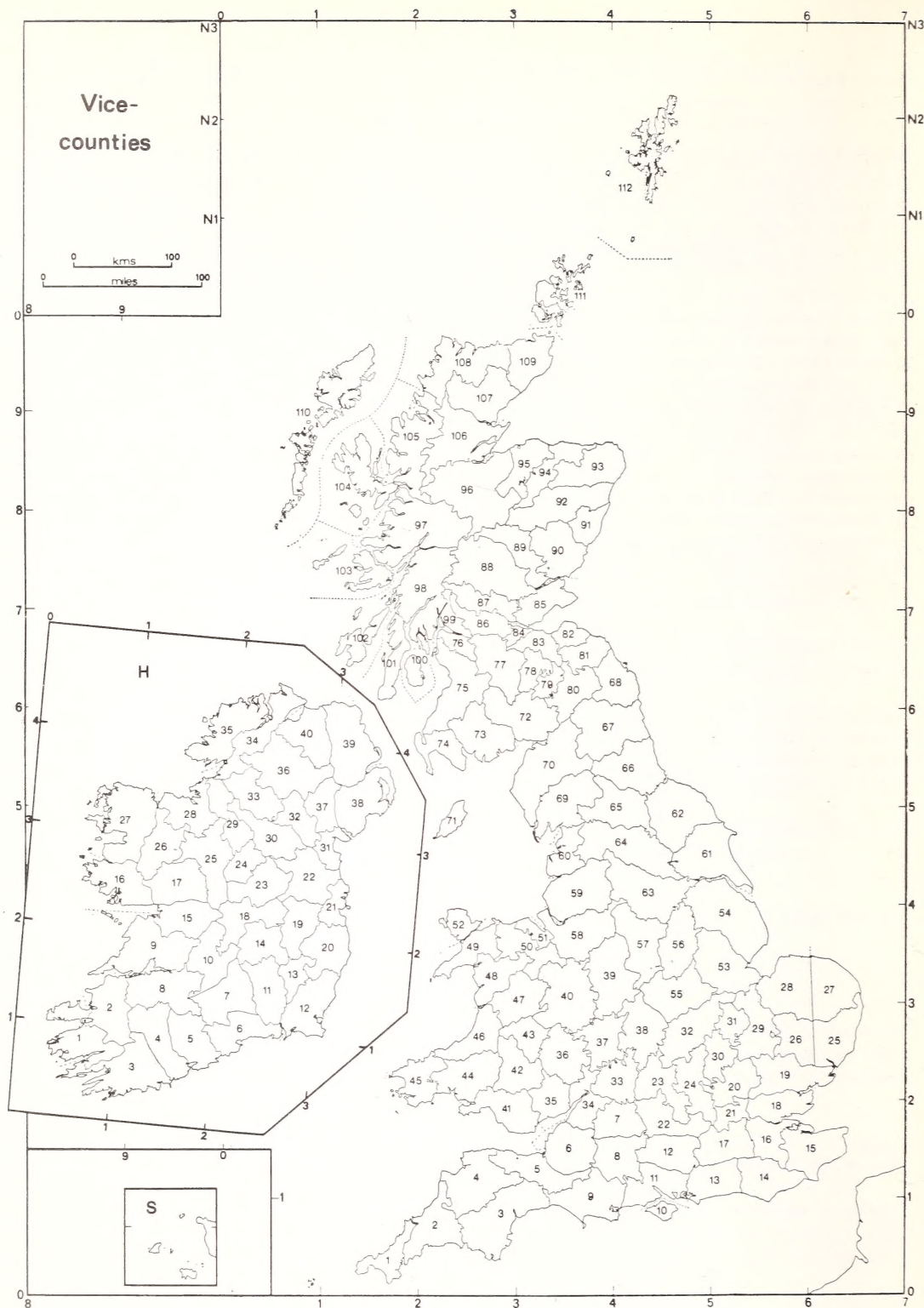
M.B.

FIELD EXCURSION HELD IN CONJUNCTION WITH THE A.G.M.

KEW GREEN AND RIVERSIDE, SURREY (V.C. 17). 10 MAY 1992

In all, 45 people attended this meeting associated with the A.G.M. at the Jodrell Laboratory, Royal Botanic Gardens, Kew. The first part of the day was spent crawling around on Kew Green (some 40 botanists' bottoms were seen) searching for the small plant species that grow on this sandy grassland. It was too early for some of the more notable clovers but we did find *Trifolium subterraneum* L., *Ornithopus perpusillus* L., *Montia fontana* L., *Rumex acetosella* L., *Stellaria pallida* (Dumort.) Piré and *Aphanes inexpectata* Lippert. On our way to St Anne's Churchyard we saw *Rumex pulcher* L. The churchyard has long been known for interesting naturalized species and we saw *Phytolacca acinosa* Roxb., *Sisymbrium strictissimum* L. and *Sisyrinchium striatum* Smith in bud, young plants of *Galactites tomentosa* Moench becoming established and lots of *Soleirolia soleirolii* (Req.) Dandy and *Atropa belladonna* L. in flower with both *Allium paradoxum* (M. Bieb.) Don and *Ranunculus ficaria* L. subsp. *bulbifer* Lambinon demonstrating bulbils. During lunch several people saw *Saxifraga granulata* L. also with bulbils, behind the cricket pavilion; it was 45 cm tall. After lunch the march along the river bank was rather poorer in interest but still managed *Angelica archangelica* L., *Oenanthe crocata* L., *Ceratochloa carinata* (Hook. & Arn.) Tutin, *Tragopogon pratensis* L. subsp. *pratensis*, *Diplotaxis muralis* (L.) DC. and *Bolboschoenus maritimus* (L.) Palla in its highest site on the tidal River Thames but we failed in our attempt to see *Barbarea stricta* Andr. After our long walk, some went on to Richmond Park and others returned to Richmond or Kew having had a good day; on the way back I saw more than 15 herons fishing in the river.

J. M. MULLIN



INSTRUCTIONS TO CONTRIBUTORS

Scope. Authors are invited to submit Papers and Short Notes concerning the taxonomy, biosystematics and distribution of British and Irish vascular plants, as well as topics of a more general or historical nature.

Manuscripts must be submitted *in duplicate*, typewritten on one side of the paper, with wide margins and double-spaced throughout.

Format should follow that used in recent issues of *Watsonia*. Underline where italics are required. Names of periodicals in the References should be abbreviated as in the *World list of scientific periodicals*, and herbaria as in *British and Irish herbaria* (Kent & Allen 1984). Further details on format can be found in *B.S.B.I. News* 51:40–42 (1989).

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