Short Notes

OBSERVATIONS ON INLAND POPULATIONS OF *VIOLA CANINA* L. IN SOUTH-EASTERN SCOTLAND AND NORTH-WESTERN ENGLAND

Viola canina is a rare inland species in southern Scotland and northern England. It is virtually restricted to coastal habitats. Recently I discovered several small inland colonies in the Tweed valley of south-eastern Scotland where it was previously unknown, and rediscovered several inland sites, mainly in Cumbria in north-western England.

In 1983, colonies of *V. canina* were found by the River Yarrow in Selkirks., v.c. 79, and their identification confirmed by Prof. D. H. Valentine. Since then further colonies have been found by the Rivers Yarrow, Ettrick and Tima Water in Selkirks., and by the River Tweed in Roxburghs., v.c. 80. Grassland sites near Ancrum in Roxburghs., and Peel Hospital in Selkirks. also support small colonies. The altitudes of the localities vary from 45–252 m. In 1985 *V. canina* was refound on the shores of Ullswater in both Westmorland, v.c. 69, and Cumberland, v.c. 70, where it was first discovered at the end of the last century (Hodgson 1898; Wilson 1936). However it appears to have gone from the rocky islands of Ullswater (G. Halliday pers. comm.). Small populations still occur on the western bank of the River Lune west of Sedburgh in Westmorland and on the eastern bank in N. W. Yorks., v.c. 65. I found an additional riverside colony by the River Eden in the Baronswood gorge in Cumberland. The two grassland sites known to me are on Wan Fell near Penrith.

The riverside habitats consist of rock outcrops, which extend into the beds of the rivers and which are inundated only by the most severe floods. The Selkirks. rock habitats and those by the River Lune are composed of hard, fine grained and relatively basic Silurian strata. Those by the River Tweed are Carboniferous basalts, and the Ullswater rocks are of the Borrowdale volcanic series which are basic in places. Although the Permian sandstones by the River Eden are acid, the riverside rocks support a calcicolous flora from flushing with lime-laden water and silt deposition. *V. canina* grows on niches and ledges on these open rock outcrops, which support a flora that includes *Antennaria dioica*, *Campanula rotundifolia*, *Galium boreale*, *Leontodon autumnalis*, *L. hispidus*, *Scabiosa columbaria*, *Solidaga virgaurea* and *Thymus praecox*.

The grassland habitat in Roxburghs. is on the shallow soil overlying an outcrop of basalt, which also supports *Dianthus deltoides*. It is of interest, and possibly relevant, that this outcrop also supports the rare maritime lichen *Ramalina polymorpha* (Corner 1981). The Selkirks. grassland site consists of a relatively basic, stony glacial till with *Leontodon hispidus*, *Polygala vulgaris*, *Ranunculus bulbosus*, *Rhinanthus minor* and, more locally, *Ophioglossum vulgare*. Vigorous colonies of the hybrid *V. canina* × *riviniana* occur at the former site and further colonies of this hybrid have been found in Roxburghs. in dry shallow grassland from which *V. canina* is absent. There are few documented accounts of this hybrid in Scotland. The two Cumberland grassland sites are on light sandy soil overlying the Permian sandstone. Although *Calluna* is extensive, there are more basic areas which can be heavily grazed by rabbits. Here *V. canina* is associated with *Centaurium erythraea*, *Conopodium majus*, *Echium vulgare*, *Galium verum*, *Gentianella campestris*, *Leontodon taraxacoides*, *Lotus corniculatus*, *Myosotis ramosissima* and *Viola riviniana*. The hybrid *V. canina* × *riviniana* is common at one site and distributed on roadside verges in the surrounding district, where it is known from five sites.

The British habitat of *Viola canina* is given as "heathy places preferring sandy soils" (Druce 1932), and "heaths, dry grassland, dunes and fens" (Moore 1987). However in Scotland and Ireland it is not infrequently found on lakeshores. Buchanan White (1898) gives its habitat as "shingly margins of rivers and lakes . . .". Hadley (1985) mentions "stony loch shores, etc." and A. McG. Stirling (pers. comm.) states that in Dunbarton, v.c. 99, it is confined to the stony or rocky shores of the mainland or islands of the southern part of Loch Lomond. In Ireland there are references to the lakeshore habitat by Scully (1916), Praeger (1934), Stewart & Corry (1938) and Webb & Scannell (1983).

It is well known that *V. canina* is intolerant of shade. It seems likely that these specialized open

waterside habits, and possibly the grassland ones also, have provided refugia for small relict populations. With the abundance of open habitats and unleached soil available in the early post glacial period, *V. canina* was probably a widespread species in Britain and Ireland. Indeed in Iceland I have seen it associated with *Alchemilla alpina*, *Galium boreale*, *Salix herbacea* and *Vaccinium uliginosum*. Godwin (1975) records it from glacial deposits in the Isle of Man dated at 10,000 years old, with tentative earlier records from the Lea Valley arctic plant beds in Essex as well as from Bronze and Iron age sites. With the expansion of the forest in the Boreal period, *V. canina* would have suffered widespread elimination. In the more northern and western parts of Britain and in Ireland, the growth of peat and leaching of soils during the wetter Atlantic period would have reduced the available habitats still further. It is now only able to exist as a relict in these open relatively basic inland sites which probably never carried closed woodland even during the post glacial forest maximum (Pigott & Walters 1954). Unfortunately these small populations are vulnerable to habitat change and their future is uncertain.

ACKNOWLEDGMENT

I would like to thank Dr S. M. Walters for helpful discussion.

REFERENCES

Buchanan White, F. (1898). *The flora of Perthshire*. Edinburgh.
Corner, R. W. M. (1981). A contribution to the lichen flora of south-east Scotland. *Trans. Proc. bot. Soc. Edinb.* **43**: 307–315.
Druce, G. C. (1932). *The comital flora of the British Isles*. Arbroath.
Godwin, H. (1975). *The history of the British flora*. Cambridge.
Hadley, G., ed. (1985). *A map flora of mainland Inverness-shire*. Edinburgh.
Hodgson, W. (1898). *Flora of Cumberland*. Carlisle.
Moore, D. M. (1987). Violaceae, in Clapham, A. R., Tutin, T. G. & Moore, D. M. *Flora of the British Isles*, 3rd ed., pp. 107–112. Cambridge.
Pigott, C. D. & Walters, S. M. (1954). On the interpretation of the discontinuous distribution shown by certain British species of open habitats. *J. Ecol.* **42**: 95–116.
Praeger, R. Ll. (1934). *The botanist in Ireland*. Dublin.
Scully, R. W. (1916). *Flora of County Kerry*. Dublin.
Stewart, S. A. & Corry, T. H. (1938). *A Flora of North-east Ireland*. Belfast.
Webb, D. A. & Scannell, M. J. P. (1983). *Flora of Connemara and the Burren*. Cambridge.
Wilson, A. (1936). *The flora of Westmorland*. Arbroath.

R. W. M. Corner
Hawthorn Hill, 36 Wordsworth St, Penrith, Cumbria, CA11 7QZ

SOME EARLY NOTICES OF ANTHOCYANIN-RICH VARIANTS OF COMMON BRITISH PLANTS

The *Lacnunga* (British Museum MS. Harley 585; edited by Cockayne (1866) and Grattan & Singer (1952)) is an Old English (Anglo-Saxon) magico-medical commonplace book dated at around 1000 A.D. but compiled from earlier sources. Much of the *Lacnunga* is adapted from Latin herbals (Cameron 1983a), although Christian as well as Saxon and Celtic pagan elements are represented. The book takes the form of herbal recipes supplemented by charms: 194 entries in all. A class of professional medical men (leeches) practised medicine at this level and had the task of trying to alleviate the common ailments of the period: particularly "spring fever" (endemic benign tertian malaria), dysentery (infection with *Entamoeba histolytica*) and abscesses caused by sheep liver fluke infestation (Cameron 1983b). As befits learned men, some able to read Latin, many Latin plant names are used. Nevertheless, roughly 50% of the *Lacnunga* plant names are Saxon in origin and an interesting source of information about our Saxon folk taxonomy. This will be discussed elsewhere, but it is notable that colours are rarely used to distinguish or denote plants.

Of some 200 plant names in the *Lacnunga* only eleven are associated with colour, such as: yelodwyrt (*Blackstonia perfoliata* (L.) Huds., yellow-wort) from the bright yellow flowers; brunwyrt (*Scrophularia aquatica* L., brownwort) from the colour of the stem; hwit cudu (white cud), and Hwitmæring (white ?mastic) both probably referring to the white gum resin of *Pistachia lentiscus* L., imported into Britain from the Mediterranean region during Saxon times. There is also hwæwen hnydele (hued nettle), said by Grattan & Singer (1952) to refer to *Lamium purpureum* L. This seems to be the only case in Saxon folk-taxonomy of a plant species being distinguished from another by a colour qualifier. However, no less than six of these eleven plants are associated with the colour red (read).

1) reade yearuwe (red yarrow – I have avoided Anglo-Saxon letters in transliterations and use appropriate modern equivalents where possible). *Achillea millefolium* L. (yarrow) is an important ingredient in Saxon leechcraft and wortcunning, being called for in seven recipes of the *Lacnunga*. One of these recipes, however (63 in Grattan & Singer's enumeration), called for reade yearuwe (red yarrow) specifically (i.e. *Achillea millefolium* forma *rosea* Desf. (Hegi 1928, p. 570)), a variant mentioned in Gerarde (1597), "common Yarrowe . . . the flowers whereof are either white or purple, which being rubbed do yeelde a strong smell, but unpleasant . . .", Lyte's (1578) translation of Dodoens, "the floures most commonly all white, sometimes also in this countrey of a purplish colour" and Bock's (1552) *De Stirpium*. Simples in *Lacnunga* recipe 63 are in alliterative pairs, and reade yearuwe has the happy property of alliterating with rædic (*Raphanus sativus* L., radish) and ribbe (*Plantago lanceolata* L., ribwort). Gerarde (1597), using Tabernaemontanus' plates, also illustrates a European species of *Achillea* of uncertain identity "the second kinde of Milfoile or Yarrow, hath stalkes, leaves, and roots like unto the former [*Achillea millefolium*], saving that his spokie tufts are of an excellent faire red or crimson colour, and being a little rubbed in the hand, is of a reasonable good savour . . . The first groweth every where in drie pastures and medowes: red Milfoile groweth in a field by Sutton in Kent, called Holly Deane [Holy-Deane in 2nd edition], from whence I brought those plants that do grow in my garden; but it is not common every where as the other is." This may be a Continental red yarrow introduced for medicinal purposes.

2) reade wuducerfille (red woodchervil). The Anglo-Saxon "cerfille", from the Latin *cerefolium*, refers to *Anthriscus cerefolium* (L.) Hoffm. (chervil), and it is not surprising that a Latin rather than Germanic name is used for a plant not native in Britain or northern Europe; rather more surprising, however, is that wuducerfille [wudufille] should be used instead of the Saxon name (now lost to us) for *Anthriscus sylvestris* (L.) Hoffm. Five entries in the *Lacnunga* call for wuducerfille and two of these (90 & 127) call for reade wuducerfille specifically (although entry 90 has "reade fille" which is probably a short form of reade wuducerfille). This variant has purple pigmentation at the nodes, or sometimes througout the whole stem and even the leaves. Extreme variants with purple-black spring leaves (Hegi 1926, p. 1020), i.e. *Anthriscus sylvestris* var. *nigra* Murr, are sometimes found growing amongst the typical morph (Gray 1863). The anthocyanin polymorphism was familiar to Johnson (in Gerarde 1636): "It hath a whitish wooddy root, from which arise round red and hairy stalkes . . . The leaves are . . . of a dark greene or else reddish colour."

3) reade hofe (red hove). The Saxons called *Glechoma hederacea* L. hove or hofe, which survives in the name alehoof. Two entries in the *Lacnunga* call for it, one (31) specifically for reade hofe which conveniently alliterates with ribbe (*Plantago lanceolata*). Plants of hove with purple stems and young leaves (*G. hederacea* forma *purpurascens* Otruba) are frequently found. Gerarde (1597) describes *Glechoma hederacea* as having "manie stalkes, of an uncertaine length, slender, and like those of the vine, something cornered, and sometimes reddish".

4) reade netele (red nettle). Netele, in five entries of the *Lacnunga*, refers to *Urtica dioica* L. However, three of these entries (49, 98 & 134) call for reade netele. Entry 134 further specifies "red nettle that groweth through into a house" ("seo reade netele the thurh ærn inwyxth"). A variant version (Meaney 1984) of entry 98 (for smallpox) occurs in Bald's *Leechbook* (entry 1.xxxix.2 in Cockayne (1865)); both clearly derive from the same earlier source and both specify red nettle, as does the next entry in Bald's *Leechbook* (1.xl, also for smallpox) which specifies: "the crop [flowering top] of red nettle". Many stinging-nettles have anthocyanin pigmentation on the ridges of their stems and petioles, and some have the entire stems dark purple and the young leaves suffused purple. An extreme variant with the leaves "suffused with violet-purple" has been described (*U. dioica* forma *purpurascens* Druce (1920)). Tabernaemontanus (1590) illustrates both variants: *Urtica maior, sive sylvestris asperior* (Groß Nettel/Brennend Nettel) and *Urtica rubra* (Rot Nettel).

Gerarde (1597) using these plates also describes them, of the second saying: "our common red Nettle, is knowne better to some than desired, and therefore needeth no description". Johnson, in his 1636 edition of Gerarde lumps the two, as does Lyte's (1578) translation of Dodoens, where he notes: ". . . our common great Nettell . . . The leaves . . . most commonly of a swarte greene colour, & sometimes reddish".

5) reade seales (red sallows). Sallow bark is required in entry 31, but in entry 155 leaf of red sallow ("reades seales leaf") is required. Several *Salices* have anthocyanin pigmentation to varying degrees, but notably *Salix purpurea* L., which has the anthers, and in some plants the twigs and buds, tinged purple. Of this species Gilbert-Carter (1936) notes "The bark is very bitter from the presence of salicin . . . which was much used in medicine before it was supplanted by . . . aspirin . . . It is an important osier, and its twigs are often boiled to strip off the bark, and to impart a red colour to the wood".

6) mugcwyrt (mugwort). The importance of colour is continued in entry 178: "If one is to have mugwort for a remedy, then let one take the red for the cure of a male and the green for the cure of a female" ("yif man scyle mugcwyrt to læcedome habban, thonne nime man tha readen wæpnedmen & tha grenan wifmen to læcecræfte" which Cockayne (1866) translates as: "If a man must have mugwort for a leechdom, then let him take the red males and the green females for a leechcraft"). Mugwort (*Artemisia vulgaris* L.) is an important item in leechcraft, used in six entries. The purple-stemmed variant of mugwort is a common plant, the most abundant in some areas according to Salmon (1931), who calls it *Artemisia vulgaris* var. *coarctata* Forselle. Others distinguish this variety on purely morphological grounds without regard to colour: contracted inflorescence and linear-lanceolate leaf segments (Hegi 1928, p. 639).

The purple mugwort variant is a familiar one. Fuchs (1542) says: "There are three Artemisias in Dioscorides and commonly found today. The first is platyphyllos which may be called in Latin *Artemisia latifolia*. This one is now simply called *Artemisia* however. Of this there are again two types contrasting in colour only: one with red stems and flowers is called in German Rotbucken or Rotbeyfüß[ss]: the other with a white stem and true yellow flowers is called by the Germans Weißbucken." Bock (1552) gives a similar account and Lyte's (1578) translation of Dodoens has: "Mugworte . . . Of this herbe there be twoo kindes moe [sic], differing onley in colour . . . The one hath redde branches & floures and is called redde Mugworte. The other hath greenish branches, changing towardes white, and is called white Mugworte, in all things els like one to an other". Gerarde (1636) has: "The second kinde of Mugwort hath a great thicke and wooddy root, from whence arise sundry branches of a reddish colour . . .", the editor, Johnson, adds: "I know not how this differeth from the former, but only in the colour of the stalke and flours, which are red or purplish; whereas the former is more whitish". Gerarde uses the woodcuts in Tabernaemontanus (1590) in which two mugworts are illustrated, viz. *Artemisia rubra*, Roter Beyfuß and *Artemisia alba*, Weißer Beyfuß.

Thus all the 'red' plants in the *Lacnunga* are unequivocally anthocyanin-rich variants, flushed with purple in their stems, leaves or flowers. It is interesting that the word 'red' is used, as Anglo-Saxons sometimes reserved this word for yellowish-red (Barley 1974). Laxity in colour description is continued today in the use of the name "copper beech" for the anthocyanin-rich variant of *Fagus sylvatica* L. The classically derived term 'purple' is based on the important colour reference point of Tyrrhenian purple, the dye derived from *Murex* spp. (in fact crimson (Stearn 1973)), which may not have been familiar in tenth century Britain.

As red variants are biochemically different from green ones, a pharmacological basis for the preference in leechcraft cannot be ruled out. The origin is more likely to lie in Roman sympathetic colour magic, however. The *Lacnunga* entries which call for red plants are almost all from the Latin and Christian sources (a & c of Grattan & Singer (1952)), while none come from the Saxon pagan source (b of Grattan & Singer (1952)). A passage of Marcellus Empiricus quoted by Grattan & Singer illustrates the importance of colour: "cut open the crop of a swallow. Little stones, both white and black will be found. Placed in a golden locket they will permanently avert all eye pain and, if wrapped in a yellow cloth or flaxen sac and hung around the neck, they avail against fevers". Another case is provided in the *Lacnunga* itself (entry 7) in which there are instructions for an eye-salve to be dripped into the eye through a flax-blue ("linhæwenne") cloth. It is possible that the red colour conveyed more power (mana of the anthropologists); indeed the symbolic significance of red persists today. These instances underline the fact that although the study of anthocyanin

polymorphism is neglected today, these red variants were observed and used by our remote ancestors.

ACKOWLEDGMENTS

Information on various points was kindly supplied by Mr P. D. Sell, Prof. R. I. Page and Dr J. R. Akeroyd; Mr Sell and Mr C. D. Preston commented on the text – my thanks to all.

REFERENCES

Barley, N. F. (1974). Old English colour classification: where do matters stand? *Anglo-Saxon England* **3**: 15–28.

Bock, J. [Hieronymus Tragus] (1552). *De Stirpium*. Strasburg.

Cameron, M. L. (1983a). The sources of medical knowledge in Anglo-Saxon England. *Anglo-Saxon England* **11**: 135–155.

Cameron, M. L. (1983b). Bald's *Leechbook*: its sources and their use in its compilation. *Anglo-Saxon England* **12**: 153–182.

Cockayne, O., ed. (1865). *Leechbook*, in *Leechdoms, wortcunning and starcraft of Early England* **2**: 1–360. London.

Cockayne, O., ed. (1866). *Lacnunga*, in *Leechdoms, wortcunning and starcraft of Early England* **3**: 1–80. London.

Dodoens, R. [tr. H. Lyte] (1578). *A niewe [nievve] herball*. London.

Druce, G. C. (1920). Plant notes, etc., for 1919. *Rep. botl Soc. Exch. Club. Br. Isl.* **5**: 575.

Fuchs, L. (1542). *De Historia Stirpium*. Basle.

Gerarde, J. (1597). *The Herball or Generall historie of plantes*. London.

Gerarde, J. (1636). *The Herball or Generall historie of plantes*, 2nd ed., enlarged and emended by Thomas Johnson. London.

Gilbert-Carter, H. (1936). *British trees and shrubs*. Oxford.

Grattan, J. H. G. & Singer, C. (1952). *Anglo-Saxon magic and medicine*. London.

Gray, J. E. (1863). On two forms of plants growing under the same conditions. *J. Bot., Lond.* **1**: 295–7.

Hegi, G. (1926). *Illustrierte Flora von Mittel-Europa* **5** (2). Munich.

Hegi, G. (1928). *Illustrierte Flora von Mittel-Europa* **6** (2). Munich.

Meaney, A. L. (1984). Variant versions of Old English medical remedies and the compilation of Bald's *Leechbook*. *Anglo-Saxon England* **13**: 235–268.

Salmon, C. E. (1931). *Flora of Surrey*. London.

Stearn, W. T. (1973). *Botanical Latin*, 2nd ed. Newton Abbot.

Tabernaemontanus, J. (1590). *Eicones plantarum seu stirpium*. Frankfurt am Main.

Q. C. B. Cronk
Corpus Christi College, Cambridge, CB2 1RH

DACTYLORHIZA TRAUNSTEINERI (SAUTER) SOÓ: VARIANTS IN NORTH-EAST YORKSHIRE

Examples of albino *D. traunsteineri* (Sauter) Soó are apparently very rare in the British Isles but records of single plants have been cited for two British localities (Roberts 1985). In June 1986 I found three such plants growing within a large colony of typical *D. traunsteineri* in N. E. Yorks., v.c. 62. All the albino plants grew within 3 m of each other and had pure white flowers with unmarked labella; the leaves were light green and also unmarked, whilst the upper stem and bracts lacked the anthocyanin staining typical of this taxon. Other than as described above, they resembled normal *D. traunsteineri* in habit, lax-flowered appearance and labellum shape and size, the plants being 10–14 cm tall, with 5–11 flowers, three or four sheathing leaves, one non-sheathing leaf, and with a maximum leaf width of 8·5–12 mm.

In the immediate area of these albino plants was a single plant of *D. traunsteineri* whose six flowers were coloured an extremely pale, delicate pink, with markedly tri-lobed labella sparingly spotted and loop-marked in bright red. This unusual and very attractive plant, whose flower colour

lies well outside the normal range for *D. traunsteineri*, apart from having a greater maximum leaf width, exhibited a marked resemblance to descriptions and illustrations of *Orchis francis-drucei* recorded for W. Ross, v.c. 105, by Wilmott (1936) and Landwehr (1977), and recently interpreted as *D. traunsteineri* (Lowe, Tennant & Kenneth 1986).

In a second colony of *D. traunsteineri* in N. E. Yorks., c. 4 km from the above, a single pseudopeloric variant was found in June 1987. This had flowers whose labella were generally completely undifferentiated, although in a few instances an extremely short (1–2 mm) vestigial spur was present. All labella were narrow, sepal-like, and forward-pointing, of typical colour but completely lacking any form of dot- or loop-markings. In each flower both lateral sepals were spread horizontally (laterally), whilst the remainder were invariably arched forward in a closed configuration. The plant was 30 cm tall and had 24 flowers, both these characters being much in excess of those found for local *D. traunsteineri*. Pseudopeloria in British orchids was reviewed by Bateman (1985) but appears to be previously unrecorded for *D. traunsteineri*.

Colour photographs of all the plants described are retained by myself.

REFERENCES

BATEMAN, R. M. (1985). Peloria and pseudopeloria in British orchids. *Watsonia* **15**: 357–359.
LOWE, M. R., TENNANT, D. J. & KENNETH, A. G. (1986). The status of *Orchis francis-drucei* Wilmott. *Watsonia* **16**: 178–80.
LANDWEHR, J. (1977). *Wilde orchideeën van Europa*. Amsterdam.
ROBERTS, R. H. (1985). Some unusual orchid variants from Anglesey. *Watsonia* **15**: 275–77.
WILMOTT, A. J. (1936). New British marsh orchids. *Proc. Linn. Soc. Lond.* **148**: 126–30.

M. J. Y. FOLEY
87 Ribchester Road, Clayton-le-Dale, Blackburn, BB1 9HT

THE BRITISH ROSE SURVEY OF 1952–54

The British Rose Survey was organized under the auspices of the Systematics Association by the late Professor P. C. Sylvester-Bradley, a paleontologist at Sheffield University with a keen interest in botany, in collaboration with Dr R. Melville of the Royal Botanic Gardens, Kew. Very little information about the survey appears in print; it was the subject of an exhibit at the B.S.B.I's exhibition meeting of 1952 (Sylvester-Bradley 1953) in which the results of a trial run conducted that summer and autumn were presented, and the strategy of the main survey for 1953 outlined. The plan was to sample 30–50 bushes from randomly selected populations and to score each individual for 38 characters relating to habit, foliage, armature, flowers and fruits (an example of a data-sheet was illustrated in *B.S.B.I. News* (Gornall 1988)); the data were later to be encoded on punched cards for statistical and taxonomic analysis. It was hoped that the results would "elucidate the nature of [rose] 'species' and the degree of reticulation present" (Sylvester-Bradley 1953; Lousley 1953). After the trial survey of 1952, extensive field work was carried out in 1953, involving 192 registered observers, 64 of whom sent in returns that year relating to 2764 bushes in 96 localities. Work, however, then rapidly tailed off over the following two seasons; the results were never analysed, and the survey was more or less forgotten.

It came as some surprise, therefore, when a total cache of 941 pressed *Rosa* specimens were exhumed from the basement of the herbarium at **K** and Mrs J. Sylvester-Bradley's garage in Leicester in the summer of 1987. These proved to represent an unknown proportion of the total gathered during the dry run of 1952 and the main survey of 1953. There was also documentation and a card index which connected the specimens with collectors and the localities visited.

A total of 213 individuals or organizations were registered as observers (many of them B.S.B.I. members) and they apparently visited 140 localities altogether, although the surviving specimens originate from only 54 of these; Fig. 1 shows the 10-km squares containing the survey sites.

Most of the specimens collected by Sylvester-Bradley had been identified but the rest (c. 800) were without names. One of us (A.L.P.) has now made determinations where possible, although it must be said that about half of the specimens were too poorly pressed, too poorly preserved, too

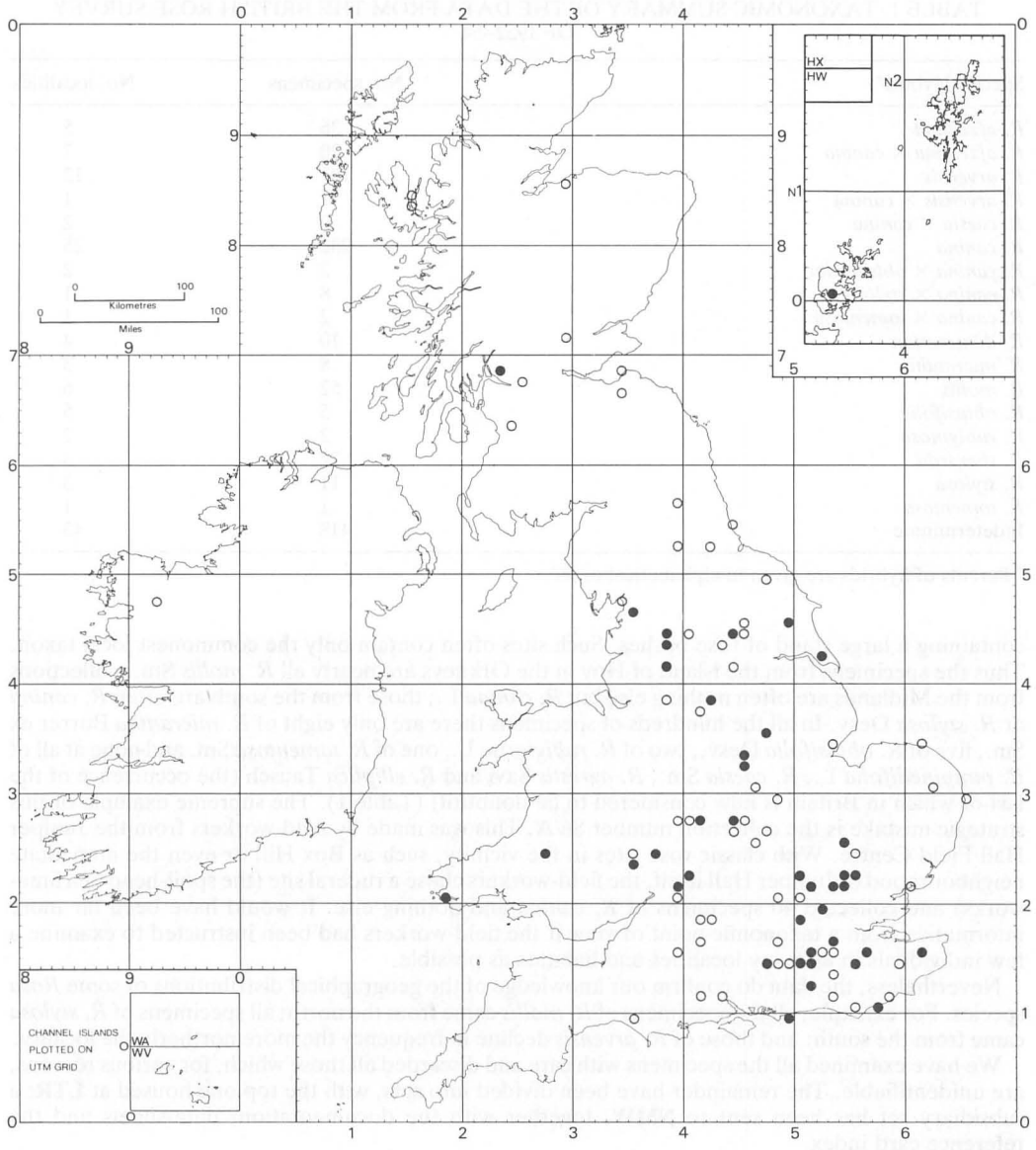

FIGURE 1. Distribution of 10-km squares containing one or more survey sites; ● with herbarium specimens, ○ without herbarium specimens.

immature or otherwise inadequate to allow identification. A taxonomic summary is presented in Table 1.

The Survey was, in our opinion, doomed to failure from the start partly because the organizers had bitten off more than they could chew; their intention was to transfer the vast amount of data to punched cards but this was never done. It is also clear from the surviving instructions and the printed data-sheets that the field-work was time-consuming and uninteresting, and the B.S.B.I. distribution maps scheme was beginning to compete successfully for the volunteer labour force.

The principal mistake which the organizers made was to confine the Survey to very small areas

TABLE 1.-TAXONOMIC SUMMARY OF THE DATA FROM THE BRITISH ROSE SURVEY OF 1952–54

Species/Hybrid*	No. specimens	No. localities
R. afzeliana	36	5
R. afzeliana × *canina*	20	7
R. arvensis	101	12
R. arvensis × *canina*	1	1
R. caesia × *canina*	9	2
R. canina	232	25
R. canina × *obtusifolia*	2	2
R. canina × *stylosa*	8	1
R. canina × *tomentosa*	2	1
R. dumetorum	10	4
R. micrantha	8	3
R. mollis	52	6
R. obtusifolia	5	5
R. rubiginosa	2	2
R. sherardii	22	3
R. stylosa	11	3
R. tomentosa	1	1
Indeterminate	418	43

* Parents of hybrids are given in alphabetical order.

containing a large stand of rose bushes. Such sites often contain only the commonest local taxon. Thus the specimens from the island of Hoy in the Orkneys are nearly all *R. mollis* Sm.; collections from the Midlands are often nothing else but *R. canina* L.; those from the south are often *R. canina* or *R. stylosa* Desv. In all the hundreds of specimens there are only eight of *R. micrantha* Borrer ex Sm., five of *R. obtusifolia* Desv., two of *R. rubiginosa* L., one of *R. tomentosa* Sm. and none at all of *R. pimpinellifolia* L., *R. caesia* Sm., *R. agrestis* Savi and *R. elliptica* Tausch (the occurrence of the last of which in Britain is now considered to be doubtful) (Table 1). The supreme example of this strategic mistake is the collection number 86/A. This was made by field-workers from the Juniper Hall Field Centre. With classic rose sites in the vicinity, such as Box Hill or even the immediate neighbourhood of Juniper Hall itself, the field-workers chose a ruderal site (the spoil-heap of a lime-works) and collected 40 specimens of *R. canina* and nothing else. It would have been far more informative from a taxonomic point of view if the field-workers had been instructed to examine a few individuals in as many localities and habitats as possible.

Nevertheless, the data do confirm our knowledge of the geographical distributions of some *Rosa* species. For example, all the specimens of *R. mollis* came from the north; all specimens of *R. stylosa* came from the south; and those of *R. arvensis* decline in frequency the more northerly the locality.

We have examined all the specimens with care and discarded all those which, for various reasons, are unidentifiable. The remainder have been divided into sets, with the top one housed at **LTR**; a subsidiary set has been sent to **NMW**, together with the documentation, data-sheets and the reference card index.

ACKNOWLEDGMENT

We should like to thank Mrs J. Sylvester-Bradley for bringing the specimens to our attention and for assisting us in sorting through them and explaining the reference system.

REFERENCES

GORNALL, R. J. (1988). Specimens and data sheets from the British Rose Survey. *B.S.B.I. News* **48**: 14–15.
LOUSLEY, J. E. (1953). Study of the British flora during 1952. *Nature* **171**: 335–337.

SYLVESTER-BRADLEY, P. C. (1953). The British Rose Survey. *Yb. Bot. Soc. Br. Isl.* **1953**: 66.

R. J. GORNALL & A. L. PRIMAVESI
Botany Department, The University, Leicester, LE1 7RH

A NEW *VACCINIUM* IN THE BRITISH FLORA?

A dwarf, prostrate, small-leaved *Vaccinium uliginosum* L. collected in 1968 by one of us (W.S.S.) on Roga Field, Shetland (GR 411/3.8) has proved to have a chromosome number of 2n=39. Typical *V. uliginosum* subsp. *uliginosum* from other British localities, e.g. Unity Bog, Cumbria (GR 35/528.591) and Hermaness, Shetland (GR 412/606.176), has 2n=48 in agreement with other European counts (Moore 1982). The more northerly subsp. *microphyllum* Lange from arctic and sub-arctic Europe is reported as having 2n=24 (Moore 1982). It has never been recorded from the British Isles. A hybrid between these two subspecies would be expected to have 2n=36.

Although the chromosomes are very small and difficult to count, consistent counts of 2n=39 have been made on the Roga Field plant. There are three possible explanations. Firstly it might be a first generation hybrid (F_1) with accessory chromosomes (2n=36+3B), though no differences in size or appearance could be detected in the chromosome set. Alternatively it might be a second (F_2) or third (F_3) generation hybrid resulting from a backcross to the tetraploid parent (subsp. *uliginosum*). Both diploids and tetraploids are probably self-incompatible (Vander Kloet 1977), so an F_2 is unlikely to have resulted from a self-fertilization, and the chance of there being two F_1 hybrid plants in the same area is probably low. Thirdly, as the Roga Field plant is similar in appearance to subsp. *microphyllum*, it might be derived solely from the subspecies through non-reduction of some chromosomes at meiosis in either pollen or ovule production.

We suggest, then, that the Roga Field area and other exposed summits and hillsides in the Shetland Isles should be searched for small-leaved, prostrate, strongly rhizomatous plants of *V. uliginosum* as they might prove to be the diploid subsp. *microphyllum*. The plant can easily be propagated at any time of year from small pieces of twig (preferably young) with attached rhizome wrapped in damp moss.

REFERENCES

MOORE, D. M. (1982). Flora Europaea *check-list and chromosome index*, p. 155. Cambridge.
VANDER KLOET, S. P. (1977). Evidence against autogamy in *Vaccinium uliginosum* L. *Proc. N. S. Inst. Sci.* **28**: 101–104.

H. A. MCALLISTER & W. S. STEWART
Liverpool University Botanic Garden, Ness, Neston, S. Wirral, L64 4AY

NARTHECIUM OSSIFRAGUM L. IN THE BURREN, COUNTY CLARE

Webb & Scannell (1983) provided distribution data for plants in the Burren, Co. Clare, v.c. H9, and therein noted that *Narthecium ossifragum* L. occurred only in districts 1 (The Clare Shales) and 3 (The Burren Lowlands). District 2 (The Burren Hills) is not notable for extensive peat deposits yet, enigmatically, it does not have an exclusively calcicolous flora; plants such as *Calluna vulgaris* L., *Erica cinerea* L. and *Eriophorum* spp. abound in the region, colonizing the small hummocks of peat that rest on the limestone rocks, and the pockets of soil which are maintained in a perpetually damp state solely by rain water. However, plants characteristic of the wettest parts of raised bogs – for example *Erica tetralix* L. and *Myrica gale* L. – are absent from this region, or at least have not yet been reported. Hitherto *N. ossifragum* was included among the absentees.

During field studies in The Burren Hills at the beginning of August 1987, I found *N. ossifragum* in several places on the higher slopes of the western hills. The first sighting was near the summit of Dobhach Bhrainin, at about 270 m, in a damp, peaty area facing north-west. About 100 flowering spikes were visible in the colony which covered less than 100 m^2 (herbarium specimens collected 1

August 1987 are in **DBN**). On the succeeding three days, other populations were noted on the north-eastern slopes and summit plateau of Cappanawalla, and on the northern slopes of Gleninagh Mountain; these colonies were substantial and much more extensive than the original one on Dobhach Bhrainin.

What is the reason for the absence of earlier reports of this species in the Burren? It is not an abundant plant, but it is certainly not rare – anyone walking on the higher slopes of the Burren hills during the summer is likely to encounter it in blossom. Perhaps the silence of earlier botanists is explained by the fact that the bright yellow flower-spikes of *N. ossifragum* can be mistaken, at a distance, for those of *Galium verum* L. or *Solidago virgaurea* L.; even at close range there is a confusing similarity between the inflorescences of *N. ossifragum* and the diminutive variant of *S. virgaurea* that inhabits the Burren.

REFERENCE

WEBB, D. A. & SCANNELL, M. J. P. (1983). *Flora of Connemara and the Burren*. Cambridge.

E. C. NELSON
National Botanic Gardens, Glasnevin, Dublin 9

NOTES ON THE ECOLOGY OF *BLYSMUS RUFUS* (HUDS.) LINK IN NORTH-EASTERN FIFE

Blysmus rufus (Huds.) Link is one of the few species considered to be a northern element in the British saltmarsh flora (Ratcliffe 1977; Adam 1978). In Scotland, *B. rufus* is found predominantly on the western coast, having a more fragmented distribution in the east (Perring & Walters 1982). It is therefore of interest that, during a coastal vegetation survey in Fife, v.c. 85 (Leach & Phillipson 1985), *B. rufus* was found to occur on 15 saltmarshes. The following observations were part of an investigation of the factors controlling the distribution of *B. rufus* in Fife (Penford 1982).

In Fife, *B. rufus* occurs on grazed beach-head saltmarshes, usually on raised beaches with a gravelly substrate. Stands are small (less than 10 m^2), and are found along the strand line at the transition zone between base-rich fen communities and *Juncus gerardii*-dominated saltmarsh. *B. rufus* often occurs as mono-dominant stands, although associates may include *Eleocharis quinqueflora* (occasionally co-dominant), *Triglochin maritima*, *T. palustris*, *Agrostis stolonifera*, *Festuca rubra*, *Glaux maritima* and *Plantago maritima*. Its confinement to the top of saltmarshes suggests that *B. rufus* is an obligate halophyte, but is unable to withstand prolonged exposure to strongly saline conditions. Soil analyses of sodium along transects (Table 1) confirmed that salinity increased

TABLE 1. CALCIUM AND SODIUM CONCENTRATIONS IN SOIL SAMPLES FROM THREE POINTS ALONG SALTMARSH TRANSECTS 8 M LONG
Figures are means ± s.e.; n = sample size

	Transect point		
	Fen zone 0 m	*Blysmus* zone 2 m	Saltmarsh zone 8 m
[Na] ppm	1011±284 n=7	1082±213 n=9	4703±1948 n=8
[Ca] $\log_{10}$ppm	4·03±0·14 n=7	4·16±0·15 n=10	3·69±0·21 n=8

sharply immediately to the seaward side of *B. rufus* stands ($t=1{\cdot}85$, $p<0{\cdot}10$) and decreased less sharply from the *B. rufus* zone to the glycophytic fen zone further up the marsh ($t=0{\cdot}20$, n.s.).

The proximity of *B. rufus* stands to fen communities containing predominantly basiphilic species, including *Carex otrubae*, *C. hostiana*, *C. disticha*, *Glyceria maxima*, *Lychnis flos-cuculi*, *Caltha palustris* and *Equisetum arvense*, suggests that *B. rufus* is subject to base-rich flushing. Soil analyses (Table 1) showed that mean levels of calcium increased slightly between the fen zone and the *B. rufus* zone ($t=0{\cdot}61$, n.s.) and decreased sharply ($t=1{\cdot}83$, $p<0{\cdot}05$) where more markedly halophytic vegetation became dominant. Thus the seaward boundary of *B. rufus* stands appeared to be influenced by a pronounced increase in salinity and a decrease in calcium.

The influence of calcium on the distribution of *B. rufus* in Fife may be significant due to the ability of calcium to ameliorate the effects of salinity. This occurs by affecting the selective ion transport mechanism at the root cells (Jennings 1976) and also by reducing the availability of sodium in cation exchange within soils (Waisel 1972). In this way, Ranwell (1972) suggests that high levels of calcium could exert a profound effect on the species composition of saltmarsh vegetation.

The similiarities in species composition between the beach-head saltmarshes of Fife that support *B. rufus* and the marshes of the western Scottish sea lochs, where it is more widespread, has been remarked on by Leach & Phillipson (1985). It is likely that, in Fife, *B. rufus* is confined to sites where a combination of factors produce conditions similar to those where this species commonly occurs. Low salinity is a feature of sea-loch marshes on the western coast and, whilst salinity is likely to be higher on Fife saltmarshes, the influence of base-rich flushing, coupled with a gravelly substrate to reduce the retention of sodium, may enable *B. rufus* to persist in localized habitats within an otherwise unsuitable area.

ACKNOWLEDGMENTS

Thanks are due to Dr A. D. Q. Agnew and Dr Ian Francis for help with the analysis. I am particularly grateful to Simon Leach for suggesting this study and for commenting on the manuscript.

REFERENCES

Adam, P. (1978). Geographical variation in British saltmarsh vegetation. *J. Ecol.* **66**: 339–366.
Jennings, D. H. (1976). The effects of sodium chloride on higher plants. *Biol Rev.* **51**: 453–486.
Leach, S. J. & Phillipson, P. H. (1985). The saltmarsh and brackish swamp vegetation of the Fife peninsula. *Trans. Proc. bot. Soc. Edinb.* **44**: 357–373.
Penford, N. (1982). *Factors affecting the status and distribution of* Blysmus rufus *(Huds.) Link in north-east Fife*. B.Sc thesis, University College of Wales, Aberystwyth.
Perring, F. H. & Walters, S. M., eds (1982). *Atlas of the British flora*, 3rd ed. Wakefield.
Ranwell, D. S. (1972). *Ecology of saltmarshes and sand dunes*. London.
Ratcliffe, D. (1977). *A nature conservation review*. London.
Waisel, Y. (1972). *Biology of halophytes*. London.

N. Penford
Rural Surveys Research Unit, Department of Geography, University College of Wales, Aberystwyth, Dyfed, SY23 3DB

TYPIFICATION OF *POTAMOGETON SPARGANIFOLIUS* LAEST. EX FR. AND *P. NATANS* SUBSP. *KIRKII* HOOKER FIL.

The hybrid between *Potamogeton natans* L. and *P. gramineus* L. is relatively frequent in northern Europe and is widespread, but very local, in the British Isles (Dandy 1975; Perring & Sell 1968). It is a variable plant, usually resembling *P. natans* but with laminar rather than phyllodal submersed leaves. The correct name for the hybrid is believed to be *P.* × *sparganifolius* Laest. ex Fr.; a later

synonym is *P.* × *kirkii* (Hooker fil.) Syme ex Hooker fil., based on *P. natans* subsp. *kirkii* Hooker fil. The purpose of this note is to typify these names.

Potamogeton sparganifolius Laest. ex Fr., *Novit. fl. suec. mant. prima* 9 (1832). Holotype: Fluv. Torn. Muonionissa, *L. L. Laestadius* (**UPS**).

P. sparganifolius was described by Fries (1832) on the basis of material collected by L. L. Laestadius "in fluviis profundissimis ad Karesuando Lapponiae". The epithet *sparganifolius* had been applied to the plant by Laestadius, but not published by him. There is in Fries' herbarium (**UPS**) a specimen labelled "Potamogeton sparganifolius Laest. Fluv. Torn. Muonionissa L. L. Laestad.", i.e. collected from the R. Torneälven at Muonio, 75 km south-east of Karesuando. There is no material annotated by Fries at **S**, where Laestadius' herbarium is deposited (F. Björkbäck, in litt. 1988). The specimen at **UPS** therefore appears to be the holotype of *P. sparganifolius*, and I have labelled it as such. If further type material is ever located, the specimen at **UPS** would almost certainly be the most appropriate choice of lectotype. It conforms to Fries' description of *P. sparganifolius* and with the current concept of the hybrid *P. natans* × *gramineus*.

Potamogeton natans subsp. **kirkii** Hooker fil., *Student Fl. Brit. Isl.* 371 (1870). Lectotype: Ballinabrack River, Lough Corrib, 7 September 1853, *T. Kirk* (herb. W. Borrer, **K**), designated here.

P. kirkii Syme in Sowerby, *Engl. bot.*, 3rd ed., **9**: 31 (1869), nom. synon.

P. polygonifolius var. *kirkii* (Hooker fil.) H. Watson, *Lond. cat.*, 7th ed., 21 (1874).

P. kirkii (Hooker fil.) Syme ex Hooker fil., *Student Fl. Br. Isl.*, 3rd ed., 535 (1884).

P. × *sparganifolius* forma *kirkii* (Hooker fil.) Hagstr. ex Pearsall in *Rep. botl Soc. Exch. Club Br. Isl.* **11**: 186 (1936).

In September 1853 Thomas Kirk collected an interesting *Potamogeton* from "deep water by the bridge against Maam Hotel, Ballinabrack River, Lough Corrib, Galway". He identified it as *P. longifolius* Gay (a taxon now regarded as synonymous with *P. lucens* L.) and distributed numerous specimens under that name. Amongst those who received these were W. Borrer and C. C. Babington. Borrer (1854) published the record of *P. longifolius* but Babington realized that this was a misidentification. He was able to compare Kirk's plant with authentic material of *P. sparganifolius* which he had been sent by Fries himself. By January 1854 he had concluded that Kirk's collection was referable to *P. sparganifolius*, as the two plants agreed "in every particular that the respective specimens afford the opportunity of contrasting" (Babington to Borrer, letter in herb. Borrer, **K**). He included it under this name in all subsequent editions of his *Manual of British Botany*, tentatively in the 4th edition (Babington 1856) but emphatically from the 5th edition (Babington 1862) onwards. Babington's opinion has been supported by recent students of the genus, including Hagström (1916), Pearsall (1931) and Dandy (1975).

Babington's contemporaries, however, did not accept that Kirk's plant was *P. sparganifolius*. J. T. Syme gave an illustrated account of it in his edition of *English Botany* (Sowerby 1869). In discussing it he specifically mentioned the only flowering specimen he had seen – a specimen in Borrer's herbarium. He was uncertain of the identity of Kirk's plant, concluding "I have seen too little of the Irish plant to venture to affirm it to be specifically distinct from *P. polygonifolius*, so that, though convinced it is not the *P. sparganifolius* of Lästadius, I keep it under this name for the present, though much tempted to designate it *P. Kirkii*, after its discoverer". He also included the name "P. Kirkii, *mihi*, MS" in this synonymy of the species. This name was taken up by J. D. Hooker of Kew, who validly published it as *P. natans* subsp. *kirkii* in his *Student's Flora* (1870). In the third edition of this *Flora*, Hooker (1884) raised it to specific rank. It was described and illustrated as *P. kirkii* in Fryer & Bennett's (1915) monograph *The Potamogetons (Pond Weeds) of the British Isles*.

As far as I am aware there has been no attempt to lectotypify the name *P. natans* subsp. *kirkii* Hooker fil. There is no material in the general herbarium at Kew which could be selected as a lectotype. However, the three sheets in the herbarium of W. Borrer of the plant distributed as *P. longifolius* by Kirk would have been available to Hooker, as Borrer's herbarium was bequeathed to Kew in 1862. Although Hooker did not annotate the sheets, which had been labelled as *P. kirkii* by

Borrer, there can be no doubt that he saw them. In the preface to the *Student's Flora* Hooker (1870) emphasized that his descriptions were derived from specimens rather than copied from books, and we know he used Borrer's herbarium in writing the account of *Potamogeton* as a specimen in it is cited under *P. obtusifolius*. As the flowering plant of *P. sparganifolius* in Borrer's collection was mentioned twice by Syme it is reasonable to conclude that Hooker would have examined it. I have therefore selected this sheet as the lectotype. The flowering plant drawn in *English Botany* (t. 1903) matches the specimen and is clearly based upon it. The detached floating leaves illustrated must, however, have come from another specimen.

P. × *sparganifolius* is a variable hybrid, variation occurring both within and between populations. The extent to which this variation is genetic rather than phenotypic has not been tested by cultivation experiments. I do not see any reason to recognize individual populations, such as that at Maam, as distinct taxa, and therefore support the reduction of *P. kirkii* to a synonym of *P.* × *sparganifolius*.

ACKNOWLEDGMENTS

I am grateful to R. Moberg (**UPS**) and F. Björkbäck (**S**) for searching for type material of *P.* × *sparganifolius*, to Lyn Nichol (**CGE**) for arranging the loan of the holotype, to D. A. Simpson for help during visits to Kew and to P. D. Sell for comments on a draft of the manuscript.

REFERENCES

Babington, C. C. (1856). *Manual of British botany*, 4th ed., p. 351. London.
Babington, C. C. (1862). *Manual of British botany*, 5th ed., p. 352. London.
Borrer, W. (1854). Notes on the 'Cybele Britannica', Volume III. *The Phytologist* **5**: 44–50.
Dandy, J. E. (1975). *Potamogeton* L., in Stace, C. A., ed. *Hybridization and the flora of the British Isles*, pp. 444–459. London.
Fries, E. M. (1832). *Novitiarum florae suecicae mantissa prima.* Lund.
Fryer, A. & Bennett, A. (1915). *The Potamogetons (Pond Weeds) of the British Isles*, pp. 16–18, tt. 8–9.
Hagström, J. O. (1916). Critical researches on the Potamogetons. *K. svenska VetenskAkad. Handl.*, n.s., **55** (5): 1–281.
Hooker, J. D. (1870). *The Student's Flora of the British Islands*, p. 371. London.
Hooker, J. D. (1884). *The Student's Flora of the British Islands*, 3rd ed., p. 535. London.
Pearsall, W. H. (1931). Notes on *Potamogeton*. II. The larger British species. *Rep. botl Soc. Exch. Club Br. Isl.* **9**: 380–415.
Perring, F. H. & Sell, P. D., eds (1968). *Critical supplement to the Atlas of the British flora*, p. 137. London.
Sowerby, J. (1869). *English Botany*, 3rd ed., **9**: 31–32, t. 1903. London.

C. D. Preston
Institute of Terrestrial Ecology, Monks Wood Experimental Station, Abbots Ripton, Huntingdon, PE17 2LS

EARLIEST RECORDS FOR TWO × *FESTULPIA* COMBINATIONS

While checking herbarium specimens in folders labelled *Festuca rubra* we have recently come across two specimens of × *Festulpia* that in each case constitute the first known record anywhere of that particular hybrid combination. Both are also new vice-county records.

1. *Festuca rubra* L. agg. × *Vulpia bromoides* (L.) S. F. Gray. Ashley Hill, W. Gloucs., v.c. 34., May 1928, *C. Alden*, ex herb. Gibbons & Bell (**LTR**). The plant was labelled "*F. rubra* var. *grandiflora* ?viviparous". Several of the spikelets are indeed proliferating, a feature we have often encountered in × *Festulpia* specimens and in other hybrid *Festuca* plants.

The measurements of this plant fall partly outside the ranges given by Ainscough *et al.* (1986), as shown in Table 1; in general the parts are somewhat larger, but the glume ratio is not exceptional.

2. *Festuca rubra* L. agg. × *Vulpia myuros* (L.) C. C. Gmelin. By railway line at Mitchell Troy, 2

TABLE 1. DIAGNOSTIC MEASUREMENTS OF TWO × *FESTULPIA* SPECIMENS

	F. rubra agg. × *V. bromoides*, v.c. 34	*F. rubra* agg. × *V. myuros*, v.c. 35
Lower glume length (mm)	3·0–4·0	1·6–2·1
Upper glume length (mm)	5·5–7·2	3·7–4·7
Glume ratio	0·5–0·58	0·47–0·64
Lemma length (mm)	6·2–7·5	4·2–5·0
Awn length (mm)	1·7–4·0	3·7–5·9
Anther length (mm)	1·1–2·2	1·0–1·4

miles S.W. of Monmouth, Mons., v.c. 35., 16th June 1951, *E. Nelmes 973* (**K**). The plant was determined by C. E. Hubbard (undated) as "*F. rubra* ssp. *commutata*" (= *F. nigrescens*).

In this case the measurements are typical of those given by Ainscough *et al.* (1986) (Table 1).

Neither of the specimens shows any sign of rhizomes; the *Festuca* parent might be *F. rubra* subsp. *rubra* or *F. nigrescens* Lam. in each case. In both cases virtually all the pollen is empty, and the anthers indehiscent.

The earliest record of *F. rubra* × *V. fasciculata* known to us is the specimen collected by J. Gosselin in Guernsey, probably between 1788 and 1791 (**STPCM**). However, there is also an undated specimen in **BM**, collected as *Festuca cambrica* Hudson and cultivated in William Curtis's garden (Curtis died in 1799), that might pre-date it.

REFERENCE

AINSCOUGH, M. M., BARKER, C. M. & STACE, C. A. (1986). Natural hybrids between *Festuca* and species of *Vulpia* section *Vulpia*. *Watsonia* **16**: 143–151.

C. A. STACE & A.-K.K.A. AL-BERMANI
Department of Botany, The University, Leicester, LE1 7RH

CRATAEGUS × *MEDIA* BECHST. IN MIDDLESEX HEDGEROWS

Studies of hedgerow *Crataegus* in Middlesex, v.c. 21, suggest that *Crataegus* × *media* Bechst. (*C. laevigata* × *monogyna*) may be more common than is suggested in some local Floras. A survey of surviving agricultural hedgerows in the London Borough of Brent (Kingsbury, Wembley and Willesden) and a small adjacent part of the London Borough of Barnet was undertaken from 1983 to 1987, using a method for locating hedgerows discussed by Williams & McLauchlin (in press). The study area was between approximately 7 and 18 km north-west of central London and covered an area of about 46 km^2, 45 of which were accounted for by Brent. Much of Brent was still farmland until the suburban expansion of London in the 1920–30s. Only two enclaves of countryside remain, Fryent Country Park and, to a lesser extent, the area around the Welsh Harp Reservoir. In the south, much of Willesden could be described as inner-city.

For the main part of the study, *Crataegus* specimens were identified in the field, using the main lateral vein curvature and leaf shape as the chief identification criteria (Byatt 1975, 1976; Williams 1986). (Slight differences in stone shape were noted between the species: *C. monogyna* had a stone with a pointed apex and *C. laevigata* had blunter stones, but this may simply be due to species differences in style and stone numbers). The survey found 548 former hedgerows or remnants (520 in Brent) and *Crataegus* was present in 257 (47%) of these. *C. monogyna* occurred in 213 hedges, *C.* × *media* in 134 and *C. laevigata* in 18 hedges. A few *Crataegus* in 13 of the hedges remained unidentified due to access or other survey problems. At Fryent Country Park, a hedgerow planted in

recent decades contained *C. monogyna* only, older hedges had both this species and *C.* × *media*, while some hedges planted before c. 1547 and others originating from assarts (woodland clearance) contained all three.

The survey area fell within 21 tetrads, though only four of these were fully within the study area. Comparisons were made with the flora of London (Burton 1983) which included *Crataegus* from all habitats and obviously from other Boroughs in the peripheral Brent tetrads (Table 1). Though the

TABLE 1. *CRATAEGUS* RECORDS FROM 21 TETRADS IN MIDDLESEX

	Brent hedgerow survey	Burton (1983)
Crataegus monogyna	18	19
Crataegus × *media*	14	3
Crataegus laevigata	9	10

Brent study was only recording *Crataegus* from former agricultural hedges, *C. monogyna* and *C. laevigata* were found in a similar number of tetrads to those in Burton (1983), but for *C. laevigata* the two studies only agreed in five tetrads. *C.* × *media*, however, was found to be much more widespread than Burton (1983) suggested. Forty-three of the 66 monads (1-km squares) partly or wholly within the study area had hedgerow *Crataegus*. Forty-one of these had *C. monogyna*, 14 had *C. laevigata* and 36 had *C.* × *media*. While some of the discrepancies between the two studies may be due to the more comprehensive search of the hedgerow study, it is suspected that *C.* × *media* is under-recorded in the London flora. *C.* × *media* may be unfamiliar to many recorders or easily confused (Jermyn 1974) and is probably commoner than local Floras indicate. As explained by Bradshaw (1975), *C.* × *media* has a range of characteristics intermediate between those of the two parents, and such is the degree of hybridization that Byatt (1975) considered the concept of the two species *C. monogyna* and *C. laevigata* to be largely irrelevant in south-eastern England. Main lateral vein curvature, when used with other characters, does, however, appear to be a useful aid for the identification of *Crataegus* in the field and may show *C.* × *media* to be more widespread in other counties.

ACKNOWLEDGMENTS

I am grateful to Prof. A. D. Bradshaw, R. M. Burton and A. P. Williams for helpful comments during the course of this study.

REFERENCES

Bradshaw, A. D. (1975). *Crataegus* L., in Stace, C. A., ed. *Hybridization and the flora of the British Isles*. London.

Burton, R. M. (1983). *Flora of the London area*. London.

Byatt, J. I. (1975). Hybridization between *Crataegus monogyna* Jacq. and *C. laevigata* (Poiret) DC. in south-eastern England. *Watsonia* **10**: 253–264.

Byatt, J. I. (1976). The structure of some *Crataegus* populations in north-eastern France and south-eastern Belgium. *Watsonia* **11**: 105–115.

Jermyn, S. T. (1974). *Flora of Essex*. Colchester.

Williams, L. R. (1986). A Hawthorn identification guide for the local historian. *Wembley Hist. Soc. J.* **6**: 38–46.

Williams, L. R. & McLauchlin, J. (in press). A method for surveying old hedgerows in suburban areas using standard trees. *Local Historian*.

L. R. Williams

Brent Leisure Services, London Borough of Brent, Brent House, High Road, Wembley, Middlesex, HA9 6SX