

Reports

CONFERENCE REPORT RECENT ADVANCES IN THE STUDY OF THE BRITISH FLORA

THE UNIVERSITY OF MANCHESTER, 20TH-21ST APRIL, 1979

INTRODUCTION

The retiring President of the B.S.B.I., Professor D. H. Valentine, organized this conference to review recent and current work on the taxonomy and biosystematics of the British flora, with special reference to the forthcoming new *Flora of Great Britain and Ireland*. Some 120 members and guests of the B.S.B.I. heard 21 papers, organized into four sections covering the topics of endemics and endemism, aliens and their status, infraspecific variation, and interspecific variation. Question and discussion of the papers was lively, with many members of the conference participating.

On the evening of the first day of the conference, Mr E. F. Greenwood of the Merseyside County Museums gave an illustrated talk on the flora of man-made sites in Lancashire, preceded by a reception, kindly given by the Office of the Vice-Chancellor of the University of Manchester.

A number of exhibits on the theme of the conference were on view in the Botany Department of the University. On the Sunday following the conference many participants made an informal visit to the Botany Department's Experimental Grounds and the Arboretum at Jodrell Bank.

All participants in the conference agreed that it had been one of the most enjoyable and informative conferences ever organized under the auspices of the B.S.B.I. A vote of thanks and best wishes were offered to Professor Valentine, who not only hosted and organized the conference, but was giving his farewell as President of the B.S.B.I. and as Professor of Botany in the University of Manchester. Despite the word 'retirement', the conference had no doubt that there would be many years of active botanical work yet to emanate from Professor Valentine.

FRIDAY, 20TH APRIL, MORNING

D. H. Valentine. *Endemics, sexual and apomictic*.

In a short introductory paper, the terms 'endemic' and 'apomictic' were defined. Sexual endemics are rare in the British Isles, but in some genera apomictic endemics are numerous and many microspecies have been described. The variation in number of microspecies in different genera calls for explanation; past history, geographical factors, habitat preference and breeding system may all be invoked. The papers in the first session record significant progress in the analysis of all the important genera.

E. Leadley & V. H. Heywood. *Endemic species of Rhynchosinapis (Cruciferae)*.

Reasons were put forward for combining the genus *Rhynchosinapis* with the Spanish genus *Hutera* under the earlier published name *Hutera*. Since the appropriate combinations have not yet been published the taxa are mostly referred to under *Rhynchosinapis*. This treatment was based on a study which included comparative analyses of morphology, population studies, seed proteins, cytology, ecology, and reproductive biology, reinforced by breeding experiments.

The combined genus occurs in western Europe and is composed of six species. These were described briefly to show how the British members are related to those of the Continent. They are *R. transtagana* (Cout.) P. Silva (S. Portugal & S. W. Spain), *R. longirostra* (Boiss.) Heywood (S. Spain), *R. richeri* (Vill.) Heywood (S. W. Alps in France & Italy), *R. wrightii* (O. E. Schulz) Dandy (Lundy Island, Great Britain), *Hutera rupestris* Porta (S. Spain) and a species which includes the British endemic taxon *R. monensis* (L.) Dandy (Isle of Man & W. coast of Britain).

The first five taxa are taxonomically and geographically isolated whereas the last species is more variable, consisting in this treatment of six subspecies and two varieties and occurring throughout the range of the genus. The variation of the latter taxon was illustrated by characters used to differentiate *R. monensis*: habit, leaf shape, indumentum, seed-size, seed shape and surface reticulation, and chromosome number. *R. monensis* has been given subspecific rank on the basis of this and other

evidence. *R. wrightii* is considered a relict species and *R. monensis* to have been isolated more recently.

A. J. Richards. *The status of Taraxacum agamospecies in the British Isles.*

Taraxacum is almost entirely apomictic in the British Isles, reproducing by seed which is almost invariably genetically identical to the parent, through diplosporous parthenogenesis. Traditionally, British taxonomists have recognized four 'species' (which would be increased to five with the modern discovery of *T. obliquum* (Fr.) Dahlst. s.l.). These are very unsatisfactory taxa, both typologically and biologically, each being composed of between 2 and 500 apparently invariable biotypes. The justification for naming these as agamospecies rests on two broad criteria: a) whether a significant number of British and Irish botanists can recognize and use independently the taxa employed by the present author in *Taraxacum Flora of the British Isles* (1972); and b) whether these taxa have an information content, for instance distributionally or ecologically, which makes their use worthwhile.

The distributional integrity and information content was examined for about 30 of the 178 species (of which, perhaps, 140 are native) currently recognized in the British Isles. A number of distributional categories were recognized, using as evidence a combination of distribution maps for Northumberland, v.c. 67 & 68, (5 km squares); for the British Isles (10 km squares); and for Europe, using the European mapping scheme template. These categories are listed, with some typical examples of each:

Narrow endemics: *T. acutum* A. J. Richards, *T. pseudonordstedtii* A. J. Richards

Habitat endemics: *T. cambriense* A. J. Richards, *T. drucei* Dahlst.

Regional endemics: *T. hibernicum* Hagl., *T. cherwellense* A. J. Richards

Widespread endemics: *T. laetifrons* Dahlst., *T. fulvicarpum* Dahlst.

Mostly British: *T. oxoniense* Dahlst., *T. unguilobum* Dahlst.

Disjunct relics: *T. cymbifolium* H. Lindb. f. (Arctic), *T. lainzii* van Soest (Lusitanian)

Channel disjuncts: *T. tortilobum* Dahlst., *T. hygrophilum* van Soest

North-west European: *T. faeroense* (Dahlst.) Dahlst., *T. landmarkii* Dahlst.

Northern European: *T. maculigerum* Lindb. f., *T. praestans* H. Lindb. f.

Subarctic: *T. naevosum* Dahlst., *T. croceum* Dahlst. s.s.

Baltic: *T. gotlandicum* (Dahlst.) Dahlst., *T. obliquum* (Fr.) Dahlst. s.s.

Western European: *T. nordstedtii* Dahlst., *T. hamatum* Raunk.

Southern European: *T. silesiacum* Dahlst., *T. retzii* van Soest

European: *T. brachyglossum* (Dahlst.) Dahlst., *T. proximum* (Dahlst.) Dahlst.

Relict, widespread in Europe: *T. glaucinum* (Dahlst.) Dahlst., *T. austrinum* Hagl.

Adventive: *T. fasciatum* Dahlst., *T. copidophyllum* Dahlst.

Casual: *T. austriacum* van Soest.

It was especially noted that in the *Taraxacum* flora of the British Isles, as currently conceived, there are no examples of Mediterranean, Alpine or Continental/Steppic elements.

It was concluded that *Taraxacum* agamospecies show informative distribution patterns, and are likely to yield information of phytogeographical interest. Thus there is a sound basis in fact for the continuing study of these taxa. In particular, it is becoming possible to suggest which species are native and which are likely to be introduced through the activities of man.

A. Newton. *Methodology in Rubus studies.*

The substance of this paper is presented on pp. 35-40.

A. C. Leslie. *Apomixis and endemism in Ranunculus auricomus L.*

This paper reviewed the cytological studies of apomixis in *R. auricomus* and a number of closely related taxa from Europe. Apomixis in this group has been shown conclusively to involve pseudogamy. Rare instances of normal, haploid, embryo-sac formation are reported, and hybrids have been obtained in cultivation between normally apomictic plants; to date this has only been achieved with the Eastern European *R. cassubicus*. Evidence confirming the pseudogamous nature of apomixis in British *R. auricomus* was presented.

A large number of taxa can be recognized in British material, many of which are endemic. This closely parallels most of the studies published on the Continent. Eighty taxa have so far been distinguished in Britain, although this figure mainly represents southern and eastern England (and even here the work is far from complete). Most of these taxa have very restricted distributions.

It was suggested that although hybridization may have been important as a source of variation in the past, and perhaps is still so today, variation originating from mutation is equally important. Some possible examples concerning British plants were discussed.

S. M. Walters. *Apomictic endemism in Alchemilla and Hieracium*.

The British representatives of the apomictic genera *Alchemilla* and *Hieracium*, both well known taxonomically, provide interesting parallels and contrasts. Thus there is only one endemic *Alchemilla* described for Britain out of a total of 12 British native species (8% endemism), whereas in *Hieracium* approximately 150 species are thought to be endemic out of the total for the British Isles of c. 250 (60%).

Some non-endemic *Hieracium* species (e.g. *H. schmidtii*) have a scattered distribution in the north and west of the British Isles essentially similar to that of *Alchemilla glabra* (though the latter is a more abundant plant). An 'arctic-alpine' pattern, again shared by many sexual species, is seen in, for example, *Hieracium holosericeum* and *Alchemilla wichurae*. Both these are familiar distribution patterns shared by many widespread northern European sexual species. Some widespread British *Hieracium* species with similar distributions are, however, endemic (e.g. *H. subcrocatum*), and their origin presents interesting problems.

Most *Hieracium* endemics are local or rare, often characterizing a particular mountain or even a particular cliff. Why such variation patterns are commoner in *Hieracium* than in *Alchemilla* may be related to the fact that some sexual or sub-sexual reproduction may be operating in the former, but seems to be wholly absent (at least in northern European taxa) from the latter genus.

FRIDAY, 20TH APRIL, AFTERNOON

D. A. Webb. *Criteria for presuming native or alien status*.

Decisions on native or alien status seem all too often to be based on inappropriate criteria, on irrelevant emotions such as local patriotism, on misinterpretation of fossil data, or on an uncritical acceptance of earlier opinions. Neither abundance nor 'looking wild' can be accepted as firm evidence of native status, as is clearly demonstrated by such species as *Rhododendron ponticum* and *Epilobium brunnescens*.

The practice of treating long-established aliens as equivalent to natives only gives rise to confusion; the former may be more difficult to recognize than recent introductions, but they are aliens none the less.

Eight criteria were suggested; very seldom will any one of them give a clear and definite answer, but if several of them provide circumstantial evidence pointing in one direction it is wise to act on it, while if they point in different directions one has to accept that for many species the status must always remain uncertain. The criteria suggested are: fossil evidence; historical evidence; habitat; geographical distribution; ease of known naturalization elsewhere; genetic diversity; reproductive pattern; supposed means of introduction.

J. G. Dony. *Wool aliens*.

Attention was first drawn to wool aliens in Britain by Hayward & Druce in *The adventive flora of Tweedside* (1919), in which they accounted for 348 species from below the woollen mills at Galashiels. In the meantime J. B. Cryer and others had recorded similar plants, mainly from the Frizenhall sewage works at Bradford.

Shortly after the Second World War it was found that wool waste, or shoddy, was used as a manure in various parts of the country. Grey shoddy, the waste from the scouring processes, contains seeds which are glutinous or covered with burs and stick to the wool; however, black or coloured shoddy, the waste from breaking down woollen garments, contains none. Most of the species recorded from fields on which shoddy has been applied are annuals, mainly because perennials cannot become established, though they may persist, at least temporarily, on sites adjacent to the fields. Lousley (*Proc. bot. Soc. Br. Isl.*, 4: 221-247 (1961)) was able to account for 529 species presumed to have been introduced with wool, but the number now known is much higher. The species are mainly Mediterranean in origin but Australasian and South African species account for a proportion; a few are now cosmopolitan.

In Bedfordshire, where shoddy has probably been in continuous use longer than elsewhere, 31% of the 366 species so far recorded are grasses and 10% Leguminosae, these apparently being most evident, and often themselves introduced, on the sheep runs abroad. In the course of time the list of species observed has changed, with some which were common 30 years ago no longer appearing, while others

which are common now having only been recently recorded. There is no proof of an annual species introduced with wool becoming established, although it is possible that *Solanum sarrachoides* may have arrived in this manner.

J. L. Mason. *Bird-seed aliens.*

The paper defines bird-seed aliens as those alien plants introduced into Britain with cage-bird food. The species of plants involved fall into two categories. The first consists of a group of about 30 plants whose seeds are imported as ingredients in bird-seed mixtures. The second is a much larger group of perhaps 200 weeds which are introduced accidentally as impurities in bird food.

The identification of these alien plants presents problems because they originate from a wide variety of countries. An understanding of the bird-seed industry, and the way in which seed is imported, cleaned and marketed is helpful in explaining the presence of the species we find growing on waste ground. The staple bird food species Canary grass (*Phalaris canariensis*) and the various millets (e.g. *Setaria italica*) are good indicators as they have no other uses in Britain. These seeds are imported from a wide variety of regions including U.S.A., Argentina, Morocco, Mediterranean Europe and Australia. A more specialized seed, Niger (*Guizotia abyssinica*), is imported from Ethiopia and India. The seed imported from some of these countries is rich in impurities, reflecting the primitive agricultural methods employed there. These factors account for the wide range of possible alien plants.

Seed imported into Britain is cleaned by the dealer to remove dust, stones and unwanted seeds. The commercial product is relatively clean and contains only a few impurities, but the cleanings are often used as, or incorporated into 'wild bird food' mixtures. Many weeds grow in areas where these products have been scattered. Other plants appear on domestic refuse tips originating from the cleanings of cages of pet birds.

D. McClintock. *Bamboos.*

The taxonomy and nomenclature of bamboos are far from settled. A broad view is usually taken, until clearer information is available. All those species naturalized in our islands come from the Far East, from northern India to Japan. They may be found growing all over the British Isles, but the decision as to whether they are naturalized is much harder to make than with most other plants. For one thing they need care in transplanting, so it is almost unknown for any detached portion to make good on its own. What we see are the survivals of human plantings, usually in present or past demesnes, policies or parks. For another, flowering is an uncertain phenomenon—two or three of the common species have never been known to flower anywhere in the world; and viable seed is usually rare or non-existent, so the genetic range cannot be ascertained. Few instances of self-sown seedlings are known, none in the wild. (Only a minority of species show any clear flowering interval in our area, and far fewer die after flowering, despite widespread belief to the contrary). Those which have running rhizomes can look to be impressively naturalized. Those which grow in close clumps never cease to look planted, even if they have been slowly ousting native vegetation for half a century or more.

With such caveats in mind, the species eventually chosen for treatment in *Flora Europaea* were *Arundinaria anceps*, *A. fastuosa*, *A. japonica*, *A. simonii*, *A. vagans*, *Sasa palmata* and *S. veitchii*. In addition the long overdue *Alien Flora* will include *A. humilis* and *A. nitida*. A descriptive key to these is given in Short Notes, pp. 59–61. It is doubtful if any of the species of *Phyllostachys* qualify, even though four were eventually allowed into *Flora Europaea*. Some 30 species are discussed by me in *The Plantsman*, 1: 31–50 (1979).

C. C. Townsend. *Taxonomic confusion caused by aliens.*

One primary reason for taxonomic confusion is species which do not, or rarely, flower (e.g. *Artemisia verlotorum*). If one presumed native, *Hydrilla*, has caused much difficulty in the British Isles, even on a generic level, how much more likely are aliens to do so. Given complete specimens, the difficulties caused may be summarized as follows:

1. Plants which may be confused with other species and thus not recognized as being different:
 - a. those confused with native species;
 - b. those confused with well-known and distinctive known aliens (e.g. the creeping willow herbs and *Acaena* spp.).
2. Plants which are recognized as introduced, but for which there is difficulty in finding the correct name:
 - a. a group in confusion in its native area;

- b. a group with no revision, or revisions of limited value;
 - c. the absence or non-availability of types;
 - d. difference of opinion among specialists.
3. Hybridization and other genetic complications.

In conclusion, an alien Flora is much needed. Descriptions of the species selected should be full, or plants will be misplaced into the nearest short description. Descriptions as well as keys should be carefully used; this is true in any Flora, particularly so of one concerning aliens. This will not make identification easier, but will guard against misidentifications, and against interesting plants being overlooked.

FRIDAY, 20TH APRIL, EVENING

E. F. Greenwood. *The flora of man-made sites in Lancashire.*

An illustrated review was given of the flora of man-made sites in Lancashire. The earliest sites still remaining are marl pits formed by the agricultural practice of marling, particularly prevalent in the second half of the 18th century. At about the same time serious attempts at reclaiming salt-marshes for agriculture were started. A little later the first navigable canals in Britain were built in Lancashire and, by the early 19th century, they had formed an extensive network throughout the county. During the 19th century there was a massive increase in the industrialization and urbanization of South Lancashire and many abandoned industrial sites now remain. These include reservoirs, gravel pits, railway cuttings, quarries, clay pits, salt and glass waste heaps, colliery shale heaps, mining subsidence hollows, sand pits and alkali waste heaps.

The generally damp and base-rich characteristics of many of the sites and the affinity of the flora with coastal areas was demonstrated. The value of the habitats formed as refugia for locally rare species, especially orchids, and their importance for nature conservation were discussed.

SATURDAY, 21ST APRIL, MORNING

B. S. Rushton. *Plantago coronopus L.: populations, seeds and chromosomes.*

Plantago coronopus possesses a rich pattern of infraspecific morphological variation which has been described under at least four subspecies, 20 varieties, 16 subvarieties and several forms. In the British Isles, only one subspecies and five varieties have been recorded.

A morphological comparison, using a multivariate analysis, of 78 *P. coronopus* populations, mainly from Britain and Ireland, observed both in the field and under greenhouse cultivation, and scored for 45 leaf and inflorescence characters indicated that:

- a. Whilst there is general similarity between populations derived from the same geographical area, there is considerable overlap between populations from different geographical regions. Coastal populations from Scotland, Ulster, Wales and England show a variation pattern that could be described as clinal. Inland English populations are different from all coastal ones, but their range of variation overlaps that of the coastal English populations. A small number of Mediterranean populations show morphological character expressions very different from any Irish or British material examined.
- b. Within certain geographical regions, particularly inland English sites, the pattern of variation observed in the field and greenhouse material can be accounted for by characteristics of the original site; in the case of inland English sites, by either altitude or degree of trampling.
- c. At some sites, selection has operated over relatively short distances (20 m) to produce significant morphological differences.
- d. Generally, population differences observed in the wild are maintained under cultivation.

Chromosomal variations (mainly trisomics) were found in populations but these showed no correlation with morphological differences. Examination of plants grown from the two seed types produced by *P. coronopus* showed that the smaller seeds produce smaller, slower growing plants and the larger seeds produce larger, faster growing plants. This is thought to contribute significantly to field population variability. Stereoscan examination of the mucilaginous seed-coat revealed extensive differences between the two seed types. There are also differences in the tolerance to salt water of germinating seeds from inland and coastal sites.

Individual plants and some populations correspond to existing varieties, but the majority do not. It is suggested, therefore, that a less rigid view of the infraspecific variation of *P. coronopus* be accepted.

J. K. Akeroyd. *Variation in Rumex crispus L.*

Rumex crispus, a widespread and abundant species of open plant communities, has long been recognized as the most variable member of its genus in the British Isles. There are three principal native variants, each occurring in a particular type of habitat. Var. *arvensis* Hardy (= var. *crispus*) is a weed, var. *littoreus* Hardy is a plant of maritime habitats, especially shingle beaches, and var. *uliginosus* Le Gall occurs on tidal mud in rivers. Each of these three variants retains distinguishing characters in cultivation.

Although the comparative biology of the weed and maritime variants has been investigated, var. *uliginosus* has received no previous experimental treatment. The plant has more or less uncrisped leaves and a tall, lax inflorescence, with long branches. The perianth segments in mature fruits bear three well-developed, subequal tubercles, as in var. *littoreus*; these probably function as a flotation device, facilitating dispersal of the fruits by water. Var. *uliginosus* and var. *littoreus* have heavier seeds than var. *arvensis*. Var. *uliginosus* is the earliest of the variants to come into flower. Only very rarely do plants of var. *uliginosus* flower in their first year of growth. Indeed, some plants do not begin to flower even in the second year. During the first year of growth a greater proportion of the biomass of var. *uliginosus* is allocated to the production of a taproot than in the other two variants.

The variation in *Rumex crispus* tends to be continuous, the picture being complicated by apparent hybridization between variants and with *R. obtusifolius*. Nevertheless, populations of *R. crispus* from riverine tidal mud are distinctive, although undoubtedly under-recorded. Further investigation may show that var. *uliginosus* is a common plant in the British Isles.

S. L. Jury. *Infraspecific variation in Torilis.*

A number of populations of several *Torilis* species have mericarps with their normal spines and hairs reduced to small tubercles. In the past these have caused considerable taxonomic confusion, often having been described as new taxa. Only in *T. nodosa* does this fruit character correlate with other characters (habit, chromosome number and distribution) and therefore warrants taxonomic recognition at subspecific level. It is suggested that the tuberculate mericarps serve to maintain the local population and the spiny ones to colonize new areas.

Torilis arvensis shows considerable morphological variation: height of plant, size and position of umbels, number of flowers per umbel, ratio of hermaphrodite to male flowers, size of petals and calyx teeth, length of styles and stamen filaments, and the degree of protandry. These characters are all correlated and relate to the degree of inbreeding/outbreeding shown. Three subspecies are recognized: subsp. *arvensis*, subsp. *neglecta* and subsp. *purpurea*.

T. A. Cope. *Taxonomy of the Juncus bufonius aggregate.*

After a long and confusing taxonomic history, the *Juncus bufonius* aggregate has been resolved into five segregates which are recognized at the species level. These comprise four diploids and a complex of various polyploids.

J. foliosus Desf. ($2n = 26$) is the most distinctive of the diploids and is characterized by its unique seed-coat morphology. It is found in the western Mediterranean and oceanic parts of western Europe, especially Ireland.

J. ambiguus Guss. (*J. ranarius* Song. & Perr.) ($2n = 34$) is geographically the most widespread of the diploids and is characteristically found in saline or brackish habitats throughout Europe, including the British Isles. It can be recognized by the very blunt inner tepals, equal in length to the truncate capsule.

J. hybridus Brot. has the same chromosome number as *J. ambiguus* but is morphologically quite different, with a fan-shaped inflorescence and acute outer tepals. It is confined to the Mediterranean region.

J. sorrentinii Parl. ($2n = 28$) is similar to *J. hybridus* but has very long, acuminate-cuspidate outer tepals, and is likewise confined to the Mediterranean region. It is, however, much rarer than *J. hybridus* and is the least known of all the species.

J. bufonius L. *sensu stricto* is commonly hexaploid ($2n = 108$). It is an ubiquitous weed found throughout much of the world. It is morphologically extremely variable and shows a much wider range of variation than any of the diploid species.

Three hybrid plants, all morphologically referable to *J. bufonius sensu stricto*, are known. Two of these, both having *J. foliosus* as the female parent, arose spontaneously in the wild and are fertile allotetraploids. The third, produced artificially from a cross involving *J. ambiguus* (female) and

J. foliosus (male), was a sterile diploid but otherwise indistinguishable from the tetraploids and hexaploids. Octoploids are also reported in the literature.

It has been concluded that the aggregate is a polyploid pillar complex and that *J. bufonius* has arisen from a number of diploids as a series of hybrids and amphidiploids. *J. bufonius* is assumed to be of polytopic, polyphyletic origin and is probably represented at four levels of ploidy.

C. A. Stace. *Taxonomy of the Festuca rubra aggregate.*

Festuca is a large, complex genus, economically important and taxonomically difficult. The *Festuca rubra* aggregate consists of those taxa included under *Festuca rubra* by Hackel in his *Monographia Festucarum Europaeorum* (1882), which account for 21 species recognized by Markgraf-Dannenberg in *Flora Europaea*, Volume 5.

Many taxa can be recognized within the aggregate, which is not much complicated by problems of hybridization, apomixis or inbreeding. Some of the taxa are widespread, but most are relatively localized, both geographically and ecologically, and, although hybridization is not difficult to perform and most of the taxa are outbreeders, very few hybrids have been detected in the wild. The plants vary from diploids ($2n = 14$) to decaploids ($2n = 70$). They appear to fall into a pattern of variation which should be adequately catered for by the species-subspecies-variety hierarchy. Before that can be satisfactorily achieved much more basic research is needed, especially in Britain, where work has fallen seriously behind that on the Continent.

It is clear that several more British taxa exist than are covered by the existing taxonomic treatments, particularly coastal taxa and montane taxa. Some 'taxa' may in fact be only characteristics, e.g. plants with flat or glaucous culm-leaves, which recur in different genetic backgrounds. Many cultivars are now available, mostly imported, and a satisfactory classification of these is needed both for legal reasons (breeders' 'rights') and because they frequently become naturalized.

These problems are being tackled at Leicester by the systematic collection of wild and cultivated taxa, the documentation of their taxonomic characters, the typification of the available names, and the investigation of hybridization potential within the group.

SATURDAY, 21ST APRIL, AFTERNOON

P. M. Smith. *Chemical characters and variation in annual Bromes.*

The use of chemical studies in taxonomy is now common. Protein comparisons have been found profitable, especially those of storage proteins. Serological and electrophoretic analyses provide considerable taxonomic information; they are cheap, rapid and require small quantities of material—all important considerations for taxonomists.

In the genus *Bromus*, protein analyses give characters to separate sections and species, and can provide quick comparisons such as 'percentage similarities'. Annual species have a range of 30–90% similarity in seed proteins. Ruderal populations of *B. hordeaceus* show little seed protein variation over wide geographical areas. Ecotypic subspecies such as subspp. *ferronii*, *thominii* and *molliformis* nevertheless show small but consistent differences.

B. interruptus is an intriguing member of this group for several reasons. It is a British endemic with strikingly distinct morphology (perhaps suggesting mutant origin); it has a record of sporadic past appearances and disappearances; it is said to have achieved its largely calcicole and south-eastern distribution as a weed of sainfoin; and it seems now to be extinct in the wild, though happily not as a laboratory organism.

Irradiation and chemical treatment of *B. hordeaceus* grains have not so far produced *interruptus*-like mutants. Marginally inductive daylengths produce panicle anomalies but do not disrupt the '*interruptus*' character syndrome. Both serological and electrophoretic seed protein analyses reveal a 75–80% similarity to *B. hordeaceus*, less than several non-controversial, 'good' species—*B. lepidus* for example. Though protein data show that the taxon differs from *B. hordeaceus* in more than just reproductive morphology, they cannot explain the adaptive significance of the latter. Shape, size, texture and density of reproductive parts do not suggest that *B. interruptus* can ever have been a sainfoin mimic.

R. S. Callow. *Evolution in a polyploid complex.*

The genus *Koeleria* is a large polyploid complex of outbreeding perennial grasses ($x = 7$; $2n = 2x-12x$). Some morphological species are always found at the same ploidy level while others are divided into

distinct diploid and polyploid races. *K. cristata*, the commoner of the two British species, is tetraploid throughout Great Britain. *K. vallesiana*, distinguished by its persistent leaf sheaths, is restricted to the Mendip Hills in N. Somerset and is predominantly hexaploid. Pentaploid F_1 interspecific hybrids and putative $5x \times 6x$ backcross hybrids have been found in five of the seven sites where both species occur together.

The largest British population of *K. vallesiana* occurs on Brean Down (c. 10,000 plants) and presents a wide spectrum of ploidy ($2n = 2x, 4x, 6x, 7x$ and $9x$). Diploids and polyploids often grow within a metre of each other and are randomly scattered over the south-facing limestone scarp. Since ancestral diploids have not otherwise been found north of the Pyrenees, the diploid plants on Brean Down may be ancient, possibly pre-glacial, relics. *Koeleria* species certainly flourish close to modern glaciers, both in the Alps and Himalayas.

Q. O. N. Kay. *Hybridization in the Anthemideae.*

Four large-flowered mayweeds in the Anthemideae grow as weeds of farmland and roadsides in Britain: *Anthemis arvensis*, *A. cotula*, *Chamomilla recutita* and *Matricaria perforata*. They are fly-pollinated, self-incompatible annuals, and are so closely similar in habit, ecology and floral characteristics that the minority species in mixed mayweed populations may be eliminated by the pollinator-mediated mechanism of minority type disadvantage.

In mixed populations of *Anthemis cotula* ($2n = 18$, AA) and *Matricaria perforata* ($2n = 18$, MM) there is a surprisingly high level of interspecific hybridization (up to 87% of F_1 seeds on *A. cotula* surrounded by *M. perforata*) that may reinforce minority type disadvantage, but may also enable intergeneric introgression to take place. F_1 hybrids are locally frequent in the field, have $2n = 18$ (AM) and are fairly vigorous. Although pairing fails almost completely at meiosis (0–3 II) they produce functional reduced ($n = 9$, A) and unreduced ($n = 18$, AM) gametes and have up to 1% seed fertility. Triploid plants ($2n = 27$, AAM) produced by a backcross of the F_1 to *A. cotula* form 9II + 9I at meiosis and have up to 30% seed fertility, with $2n = 19$ – 24 (AA +, forming 9II + Is at meiosis) in the second backcross generation, some of which are already almost indistinguishable from *A. cotula*, and $2n = 18$ – 20 in the third backcross generation. Of two diploid or near-diploid plants produced by the F_1 (as seed parent) backcrossed to *A. cotula*, one had $2n = 18$ and closely resembled *A. cotula*. It formed 9II at meiosis, and had more than 20% seed fertility, with $2n = 18$ and full fertility in the second backcross generation. It was identical to *A. cotula* and presumably had the AA genome.

Intergeneric introgression from *M. perforata* to *A. cotula* is thus potentially able to take place, and a similar process may lead from *A. cotula* to *M. perforata*. The regaining of the parental diploid genome is possible because there is a very low level of intergenomic chromosome pairing, combined with high, and regular intragenomic pairing. Although similar pairing behaviour is often involved in the origin of new fertile allopolyploid species its possible role in introgression between distantly related diploid species has apparently been ignored.

G. M. Fearn. *Interspecific variation and hybridization in Cochlearia.*

The genus *Cochlearia* has been the subject of considerable taxonomic confusion, particularly within *C. officinalis* agg. This confusion is thought to be due to a combination of factors: the immense range of variation in coastal and inland populations of the *C. officinalis* group, erroneous chromosome reports, and interspecific hybridization. Recent cytotaxonomic research has shown the existence of three distinct cytotypes within the *C. officinalis* group which are correlated with differences in geographical and ecological distribution. Natural hybrids (*C. anglica* \times *C. officinalis* and *C. danica* \times *C. officinalis*) occur where the habitats of the parent species overlap, and introgression may occur. Artificial hybrids have been synthesized between almost all British species (inland and coastal) and the majority of hybrid plants have extremely high pollen fertility, indicating that there is little genetic isolation of species. It is suggested that the most useful taxonomic treatment of the genus, in the light of recent studies, is to retain *C. anglica*, *C. danica* and *C. micacea* as distinct species. *C. officinalis* is subdivided into coastal tetraploids (subsp. *officinalis*), high altitude tetraploids (subsp. *alpina*) and mid-altitude diploids from base-rich sites (subsp. *pyrenaica*). *C. scotica* is thought to represent no more than a local ecotype of *C. officinalis* subsp. *officinalis*.

H. McAllister. *Recently discovered segregate taxa in the British flora.*

Chromosome counts made in connection with the B.S.B.I. ivy survey revealed the presence of two

chromosome races of ivy in the British Isles. *Hedera helix* is diploid ($2n = 48$) and occurs throughout most of Great Britain except the West Country and West Wales. In these areas, and in Ireland and the Isle of Man, only tetraploid ($2n = 96$) plants have been found. The cytotypes can be distinguished by the form of their scale-hairs—appressed to the leaf surface in the tetraploid and standing out in all directions in the diploid *H. helix*. The tetraploid is found in western France, the Pyrenees and Spain, while *H. helix* occurs through Central Europe eastwards to the Crimea. The tetraploid is therefore an Atlantic species with a southerly distribution.

In the *Campanula rotundifolia* aggregate the large flowered hexaploid ($2n = 102$) has a northern Atlantic distribution in the British Isles but has been replaced from the south and east by the now much commoner tetraploid ($2n = 68$).

In recent work by David Parker, *Saxifraga hypnoides* has been shown to have diploid ($2n = 26$) and tetraploid ($2n = 52$) cytotypes. The diploid occurs in Wales and the Burren, Ireland, while the tetraploid is found in Scotland, the Pennines, Northern Ireland and the Burren.

Deschampsia cespitosa also consists of diploids ($2n = 26$) and tetraploids ($2n = 52$) with distinct geographical distributions, and the tetraploid has given rise to viviparous forms which have been confused with the arctic *D. alpina*.

Other species being investigated include *Ledum groenlandicum*, *Vaccinium uliginosum* and seminiferous *Poa alpina*.

ANNUAL GENERAL MEETING, 12th MAY, 1979

The Annual General Meeting of the Society was held at the University of Leicester on Saturday, May 12th, 1979, at 12 noon, with 65 members present. Professor D. H. Valentine (retiring President), in the chair, opened the meeting.

MINUTES OF ANNUAL GENERAL MEETING, 1978

The minutes as published in *Watsonia*, 12: 281–282 (1979) were passed with the following corrections to the minuted Report on the B.S.B.I. Committee for Scotland (para 2):

The meeting recorded thanks to all who had served as officers and members of the Committee for the Study of the Scottish Flora during the 23 years of its existence, particularly to Mr B. L. Burt, Chairman on its inception in 1955; to the late Mr R. Mackechnie, who, sadly, had died earlier this year, but had been Chairman from 1958, and to Mr B. W. Ribbons who had been a founder member and secretary to the Committee for 15 years.'

REPORT OF COUNCIL

The Report of Council for the calendar year 1978 had been circulated to members and was adopted unanimously by the meeting.

TREASURER'S REPORT AND ACCOUNTS

The Report of the Treasurer and Accounts had been circulated to members. The deficit of £645 excess of expenditure over income had arisen despite economies in many directions. The Report and Accounts were adopted unanimously.

INCREASE IN MEMBERSHIP SUBSCRIPTIONS

The Treasurer's proposal to increase membership subscriptions was passed *nem. con.* after discussion, the new rates per annum from 1st January, 1980, to be as follows:

Ordinary	£7.50
Junior	£3.00
Family	£1.00
Subscriber	£7.50

(New members who join on or after 1st October, 1979, to pay the new rates to cover to 31st December, 1980).

CHANGE TO RULE

The proposed amendment to Rule 24, Annual Subscription, namely to add:

'Persons over 60 who have been members of the Society for at least 10 years and who are no longer in full time employment may elect to pay an annual reduced subscription at such rate as from time to time shall be decided by Council'

was passed with few abstentions after discussion. It was stressed that this new category of subscription would be only for those of the eligible members who individually applied for the reduction.

ELECTION OF PRESIDENT

Mr R. W. David, C.B.E., M.A., had been nominated by Council. His election was proposed by Miss E. Young and carried unanimously with applause. Mr David then took the Chair, and thanked Professor Valentine for his tactful Chairmanship as President during an important two years, culminating in the highly successful Conference held in his Department at the University of Manchester in April.

ELECTION OF VICE-PRESIDENT

The nomination of Mr D. H. Kent was proposed by Dr J. G. Dony, who recalled that Mr Kent had contributed much to the Society, and for one period of 15 years the B.S.B.I. had revolved around his activity and effort. The election was carried by acclamation.

ELECTION OF OFFICERS

Mrs M. Briggs (Honorary General Secretary); Mr M. Walpole (Honorary Treasurer); Drs S. M. Eden, N. K. B. Robson, C. A. Stace and D. L. Wigston (Honorary Editors); Mrs J. M. Mullin (Honorary Meetings Secretary); Miss L. Farrell (Honorary Field Secretary) and Mrs R. M. Hamilton (Honorary Membership Secretary) had been nominated. Their re-election was carried unanimously and these Officers were thanked collectively for their hard work on which the organization of the Society depended.

ELECTION OF COUNCIL MEMBERS

Mr R. J. Pankhurst, Dr G. Halliday and Dr S. L. Jury had been nominated and were unanimously elected. Their order of precedence (for Rule 10) as given, was determined by ballot.

ELECTION OF HONORARY MEMBERS

Dr C. A. Stace, proposing the election of Dr G. Halliday, an Honorary Editor of *Watsonia* for the past 12 years, praised Dr Halliday's editorial expertise in the highest terms. The present editorial team felt that he was irreplaceable. His election was unanimous, and Dr Halliday recorded his thanks, saying how much he had enjoyed his term as Editor which had greatly extended the number of his botanical friends and contacts.

Professor D. H. Valentine then, with warm commendation, proposed Mrs M. Briggs, who had been an officer of the Society since 1964 and Honorary General Secretary for seven years. The election was carried, and Mrs Briggs sincerely thanked the Society for this honour which had come as a complete surprise and was very much appreciated.

ANY OTHER BUSINESS

There being no further business the President thanked Professor H. Smith for his permission to hold the meeting in the Department, and Dr C. A. Stace for the excellent arrangements. The meeting closed at 12.33.

M. BRIGGS

PAPERS READ AT THE ANNUAL GENERAL MEETING

THE LEICESTERSHIRE FLORA SURVEY, 1967-79

The survey was formally initiated by a steering committee of nine in September 1967. It has been a team effort, involving in all some 30 local botanists, but most of the credit for its smooth and efficient running must go to the Rev. A. L. Primavesi who has acted as Hon. Secretary to the Committee since its inception.

Detailed instructions for fieldworkers were drawn up in the first six months and fieldwork started in

spring 1968. The survey was based on the tetrad (2×2 km) of which there are 457 complete and 98 significant marginal (i.e. containing more than 1 sq. km.) in the pre-1974 administrative county of Leicestershire. Two field record cards were completed for each tetrad. The *common species card* has the abbreviated names of 248 species and columns for a subjective estimate of frequency and characteristic habitat in the tetrad as a whole. The *other species card* has columns for abbreviated name, six-figure grid-reference, habitat and frequency for each record. Up to four records were entered on this second card for any one species in any one tetrad. Fieldworkers were required to forward material of critical groups to a referee unless, or until, given exemption for that group. The following genera were the subject of special surveys made in co-operation with national experts: *Hieracium*, *Rosa*, *Rubus*, *Taraxacum* and *Ulmus*.

At the end of each field season fair copies of the field record cards were forwarded to the Hon. Secretary, who transcribed the records on to *species record cards* and *tetrad map cards*. These cards formed the starting point for the systematic account which will be a major component of the Flora. Other features will include habitat studies, a gazetteer and, if time and space permit, a parish-by-parish account of the flora of the county. In eleven field seasons over 100,000 records have been accumulated, averaging 180 species per tetrad and exceeding 450 in two cases. The survey was funded from local and national sources and the *Flora* will be published by the Leicestershire Museums Service in 1980.

I. M. EVANS

PROBLEMS ASSOCIATED WITH THE GENUS *ROSA* IN LEICESTERSHIRE

The genus *Rosa* is taxonomically difficult because of its unique method of reproduction, many species being unbalanced polyploids in which the seed parent provides most of the genetic material. They also hybridize freely, making it difficult to define the limits of a species. For the practical purpose of recording, a system of classification is needed to accommodate as many as possible of the complex hybrids which cannot be positively identified, otherwise the majority of the roses would be left unrecorded. Most British rhodologists favour the system which was adapted for the British roses by A. H. Wolley-Dod, in which a fairly wide view of the limits of a species is taken, and the species are subdivided into 'groups', into which most of the roses actually encountered in the field can be placed. In recording for the new Flora of Leicestershire, these 'groups' have been used as the recording units. For someone unfamiliar with the roses, the multiplicity of intermediates is extremely bewildering, and the taxa which predominate in one part of the country differ markedly from those from elsewhere. An experienced rhodologist can appreciate the problems peculiar to a particular district. Before an attempt is made to record roses for a local *Flora*, the advice of such an expert should be sought, and ideally he should examine a collection of local material, and make a visit to the region. It is not difficult, with initial help from an experienced rhodologist, to become familiar with the species and their 'groups'. Provided that time is not wasted in attempting to assign individual rose bushes to a named variety, tetrad recording for a local *Flora* is a practical possibility. It is, however, essential that the field-workers keep within the limitations of their knowledge of this difficult genus, and submit anything doubtful for expert determination.

A. L. PRIMAVESI

ULMUS IN LEICESTERSHIRE

The Leicestershire flora contains populations of five quite distinctive variants of elm, within which little morphological variation is evident, and a whole range of others much less easily separable into distinct groups. The five are best known under the following names:—*Ulmus glabra*, *U. procera*, *U. plotti*, *U. coritana* and *U. × sarniensis*. The remainder can either be regarded as hybrids descended from two or more of these, or as members of vegetatively reproducing clones showing different and often intergrading mixtures of morphological characters. These are characters also found among the more clearly demarcated taxa, though are not necessarily inherited from them. A dozen or more such clones have been observed to occur only in single localities or in a small number of neighbouring ones, but far more frequent and widely distributed are intermediates which for practical purposes can best be thought of as constituting two 'field elm pools', one showing signs of *U. glabra* ancestry and the other not. Colour slides of examples of different types and of distribution maps were shown and discussed.

Three problems relating to what the speaker had found in a comprehensive field survey based on

tetrad mapping were discussed. These were, first, the effects of Dutch elm disease and the possibility that some elm populations may eventually be reestablished from sucker growth; second, the existence of two quite different systems of nomenclature depending on the view taken of the taxonomic status of the elms seen, and the difficult choice between the systems facing the local Flora writer; third, questions arising from the difficulty of deciding in the field the likely origin of individual populations and specimens, whether indigenous or deliberately introduced. Related to this is the sparseness of information in the literature about experimental breeding of elms, particularly in respect of the view that elms do not self-fertilize and that all viable seed is the result of cross-fertilization.

K. G. MESSENGER

PROBLEMS ASSOCIATED WITH ALIEN PLANTS IN THE BRITISH ISLES

The study of species alien to the British Isles (i.e. brought here deliberately or unintentionally by man) is very popular with some botanists, but shunned by others. There are often great problems in the identification of aliens, especially since new species are arriving every year and their origin is often unknown. Alien species should certainly be excluded from a floristic analysis of a region. Nevertheless, there are many very well established aliens which have a marked effect on one or other aspects of our flora and vegetation, and they cannot be ignored. Apart from their accurate identification, the biggest problem lies in deciding which species are sufficiently common or well established to be worthy of inclusion in Floras, plant lists, etc.

For the forthcoming *Flora of Great Britain and Ireland* the following categories are to be included: naturalized aliens (even if in only one locality); commonly recurrent casuals; crop species. Extinct aliens are to be excluded. After wide circulation of a draft list and the incorporation of the numerous replies to it, a revised list of nearly 900 species to be included in the *Flora* has been compiled.

In the talk the importance of aliens in four main ways was emphasized:

1. For floristic analyses and distributional studies the correct identification and status of each species is essential.
2. For the accurate documentation of experimental work, correct determination is vital; too often alien species are misidentified or confused with native or other alien species.
3. In studies of hybrids—many alien species hybridize with native ones in this country, or even form new amphidiploid species, so that the genetic structure and spectrum of variation of native species is altered.
4. In ecological studies—many alien species have profound effects on the native vegetation and the early history of all alien species should be carefully followed.

C. A. STACE

EXCURSIONS HELD IN CONNECTION WITH THE ANNUAL GENERAL MEETING

PASTURE AND ASPLIN WOODS, AND CROFT PASTURE, LEICESTERSHIRE. 13TH MAY, 1979.

A number of members attending the Annual General Meeting on the previous day visited Pasture and Asplin Woods, which lie to the edge of the parish of Breedon-on-the-Hill in north-western Leicestershire, over boulder-clay. A considerable amount of woodland was present in this area at the time of the Domesday survey in 1086, and from their flora and knowledge of their history it would appear that the greater part of the woods is 'ancient'. A comparison of maps made at the time of the enclosure and at present show that some changes in the outline of the woods have occurred and these are reflected in a complicated set of woodbanks and old hedge-lines which are now within the woods. The area is a proposed Site of Special Scientific Interest and the Nature Conservancy Council have been involved in discussions on its future.

The party also visited Croft Pasture, similarly scheduled as an S.S.S.I., situated a little to the west of Croft village. The main interest of the site is botanical, with approximately a fifth of the total acreage being herb-rich siliceous grassland interrupted by outcrops of syenite. Here a fine collection of sand-loving plants are found. The remaining area is 'improved' grassland, much of which is flooded in the winter. The whole site is bisected by the River Soar, which here has an interesting aquatic and riparian vegetation, highlighted by *Oenanthe fluviatilis* in its only known site in the county. The Leicestershire

and Rutland Trust for Nature Conservation recently negotiated an access and management agreement for the property as a nature reserve. Access is limited to permit holders.

P. A. EVANS & S. H. BISHOP

BOTANICAL SOCIETY OF THE BRITISH ISLES, COMMITTEE FOR SCOTLAND
EXHIBITION MEETING, 1978

An Exhibition Meeting was held at the Department of Botany, University of Glasgow, on Saturday, 4th November, 1978, at 12.00 hours jointly with the Botanical Society of Edinburgh and the Andersonian Naturalists of Glasgow. The following exhibits were shown:

- G. H. BALLANTYNE. Brambles in Fife and Kinross.
 R. W. M. CORNER. *Carex vaginata* and other plant records for Roxburgh and Selkirk.
 R. W. DAVID. The distribution of *Carex rupestris* All. in Britain.
 J. H. DICKSON. (a) Plants that the Romans brought to Glasgow.
 (b) Plants from the Canary Isles.
 U. K. DUNCAN. The *Festuca rubra*/*F. ovina* agg. complex.
 M. J. FRASER. *Atropa belladonna* L. in mediaeval Elgin.
 G. HALLIDAY. Recording the flora of Cumbria.
 N. T. H. HOLMES. A guide to the identification of species of *Ranunculus* L. subgenus *Batrachium*.
 A. G. KENNETH. A *Rubus* sp. sect. *Triviale* widespread in Kintyre.
 P. MACPHERSON & E. R. T. CONACHER. *Coriandrum sativum* L. introduced to Glasgow by immigrants.
 D. M. PARKER. *Saxifraga hypnoides* and *S. rosacea* in the British Isles.
 F. H. PERRING. Recently published local Floras, including a reprint of Buchanan White's Flora of Perthshire.
 A. RUTHERFORD & H. A. McALLISTER. A *Hedera* new to Britain.
 A. J. SILVERSIDE. *Pulmonaria rubra* in Glen Shee.
 O. M. STEWART. (a) Flower paintings.
 (b) V.C. 73 records.
 A. MCG. STIRLING. (a) Specimens from Glasgow University Herbarium.
 (b) *Ledum palustre* and *L. groenlandicum*.
 E. C. WALLACE. Herbarium sheets of plants collected by the late R. Mackechnie.
 M. MCC. WEBSTER. (a) Plates from the *Flora of Moray, Nairn and East Inverness*.
 (b) Plants from north-eastern Scotland, fresh and pressed.

FIELD MEETINGS, 1978

ENGLAND

CRANBERRY ROUGH, GREAT HOCKHAM, W. NORFOLK. 11TH JUNE

The object of the meeting, attended by 28 members, was to examine sedges. The water-level in the fen, flooded a fortnight earlier, was still very high, and the path along the northern boundary was extremely boggy and in places precarious. Some members had visions of disappearing for ever, like Carver Doone, into the mud. But the sun shone bright, the party voted to do or die, and on the whole enjoyed the adventure and the extraordinary Everglades-like scenery of the adjoining carr, full of *Hottonia* and *Thelypteris palustris*. A dozen *Carices* were seen, including fine specimens of *C. pseudocyperus* in all stages of growth, and particular attention was given to separating the three species-pairs *C. acutiformis*/*C. riparia*, *C. elata*/*C. nigra*, and *C. paniculata*/*C. appropinquata*. After a picnic lunch on the dry land of the disused railway, the party returned through open water-meadows on the south of the carr, where three more sedges (including *C. disticha* in sheets) were added to the list.

Particular thanks are due to the Norfolk Naturalists' Trust, who gave permission for this visit to their Reserve, and to the Warden, Mr Eric Campbell who, though prevented by illness from attending the meeting as planned, gave invaluable help in the preliminary organization and reconnaissance.

R. W. DAVID

WARMWELL CROSS, DORSET. 19TH-20TH AUGUST

About 30 members attended this meeting and were lucky to have good weather. The first locality visited was Winfrith Heath, where a small piece of recently ploughed land had a weed new to Dorset, *Solanum sarrachoides*, growing with *Misopates orontium* and *Stachys arvensis*. Nearby, *Chamaemelum nobile*, *Anagallis minima* and *Radiola linoides* were found along damp, sandy tracks. On the heath, the heathers and *Ulex minor* were recovering well from the devastating fire of 1975, and the valley bog which escaped the worst of the fire still had *Gentiana pneumonanthe*, *Hammarbya paludosa*, *Pinguicula lusitanica* and a rich associated flora. Only two species known to be present before the fire were not refound (*Lycopodium inundatum* and *Rhynchospora fusca*); *Deschampsia setacea* was seen in a later visit.

Lunch was taken at Hardy's monument on Black Down, with soaring buzzards and panoramic views. A small area of turf had *Anthyllis vulneraria*, *Gentianella amarella* and *Sagina nodosa* growing amid heather, bilberry and *Ulex gallii*; despite careful search, moonwort could not be found here.

After a short stop at Portesham to see *Cyclamen hederifolium* in flower, with what seems to be *Ulmus americana* planted nearby, the party moved to Abbotsbury. The ridge of iron ore running north from the Tropical Gardens was found to have several interesting plants, including *Armeria maritima*, *Bromus ferronii*, *Genista tinctoria*, *Oenanthe pimpinelloides* and *Trifolium subterraneum*. By permission of the Estate, we were allowed to visit the ruins of the old castle, which was destroyed by fire in 1913, where a number of alien plants have survived (*Acanthus mollis*, *A. spinosus*, *Allium siculum*, *Atriplex halimus*, *Cordyline australis*, *Euonymus japonicus*, *Ficus carica*, *Oxalis incarnata*, *Rhus typhina* and *Salpichroa organifolia*). The back of the Chesil beach was visited, and despite the densely-parked cars, *Apium graveolens* and *Carex divisa* were seen; *Lathyrus japonicus* and *Suaeda fruticosa* occur further east by the Swannery, where access is restricted.

The party then split into groups to record tetrads on the Isle of Portland. Among the many interesting plants seen were *Asplenium marinum*, *Crambe maritima*, *Inula crithmoides*, *Hypericum hircinum* and *Matthiola incana* (the last two naturalized in very wild country near East Weares), *Medicago polymorpha* and *Thesium humifusum*; *Orobanche hederæ* was abundant. A *Limonium* believed to be *L. recurvum* was seen in two localities, but it was agreed that the characters distinguishing this taxon from *L. binervosum* scarcely warrant their separation as species.

After a barbecue at Ringstead where *Cantharellus* featured on the menu, there was just enough light remaining to find *Spiranthes spiralis* and *Trifolium squamosum* by the cliffs.

On 20th August the party reassembled at Rempstone and walked to Cleavel point via Ower, through plantations with *Tsuga heterophylla* and *Quercus borealis* and wet heaths with masses of Dorset Heath (*Erica ciliaris*) and its hybrid with *E. tetralix*. *Equisetum variegatum* and *Polygonum mite* were found in one spot. In sandy cultivated fields *Hypochoeris glabra* was growing with *Lotus hispidus*, while *Briza minor* was found surviving in sown pasture which was a cornfield last year. An unexpected bonus was a good view of an iron age pottery kiln in course of excavation, with its spoil heaps colonized by the yellow-flowered form of the wild radish. Lunch was taken on the shores of Poole Harbour, enlivened by a heron, a flock of Canada Geese and possible Sandwich Terns. Many common salt-marsh plants were seen here, including *Limonium vulgare*, *Oenanthe lachenalii* and *Spartina anglica*.

After ascending Brenscombe Hill through old woodland with ancient holly trees, *Campanula trachelium*, *Polystichum* sp. and *Veronica montana*, the summit grassland had little of interest, but the views of Purbeck, Poole Harbour and the Isle of Wight were superb. Developments caused by the discovery of petroleum were changing the face of Wytch Heath. On descending to this heath, so many landmarks had been obliterated that the leader got lost, but eventually *Cicendia filiformis* and *Parentucellia viscosa* were both found along rutted tracks. The meeting broke up after a valedictory tea at Wareham, apart from an unsuccessful attempt to refind *Leersia oryzoides*.

H. J. M. BOWEN

WALES

RHOS GOCH BOG, PAINSCASTLE, MID RADNORSHIRE. 8TH JULY

A party of 15 including members of B.S.B.I., Hereford and Radnor Nature Trust and Hereford Botanical Society met in mixed weather to examine a variety of mire communities. The area, one of the early S.S.S.I.s, consisted of a raised mire with a well developed willow carr along the surrounding lagg streams and fen and wet peaty meadows. The meadows were the first to claim attention and yielded a very diverse flora, with over a hundred species recorded. The wetter hollows supported species such as *Triglochin palustris*, *Scirpus setaceus*, *Pedicularis palustris* and *Pinguicula vulgaris*, whilst the ridges were marked by an abundance of *Cirsium dissectum*, *Dactylorhiza* spp. and *Genista tinctoria*.

With difficulty the lagg stream was crossed and the willow carr penetrated with its tall tussocks of *Carex paniculata* and *Menyanthes trifoliata*. The drier slopes of the raised mire were then examined. Dwarf shrubs predominated with *Genista anglica* in some abundance. On the central dome, apparently being at present colonized by birch, *Osmunda regalis* proved to be widespread, whilst *Drosera rotundifolia* and *Narthecium ossifragum* grew in the *Sphagnum* lawns of the pools.

Happily the weather cleared after a somewhat damp picnic lunch. The party then moved to the south-west end of the site where the fen provided a challenge to the nerve of the hardest botanist. Fortunately the floating lawns of vegetation proved capable of carrying the weight of the party and a wide range of 'poor fen' species were examined.

Later in the day a small party travelled south to an area of common land called the Begwns where a shallow mud bottomed pool was looked at. In common with many other pools in the area *Pilularia globulifera* was abundant with *Apium inundatum* and *Scirpus fluitans*.

A. C. POWELL & R. G. WOODS

LAMPETER, DYFED. 21ST-24TH JULY

A four-day Bramble Foray at Lampeter was attended by some 15 members. The object was partly to provide some teaching and understanding of bramble taxonomy, and partly to make distribution records on a 10 km square basis in N. W. Carmarthenshire and S. Cardiganshire. Two parties, each of two carloads, were organized, and each was led by one of the two leading British batologists, Mr E. S. Eedes and Mr A. Newton. The participants ranged from absolute beginners to those with a sound knowledge of the brambles of their own areas, and the enthusiasm and the patient, often of necessity repetitive, helpfulness of the leaders made it an extremely rewarding foray for all concerned. Mr H. Vannerom, a Belgian batologist, was a welcome guest.

Members from two of the national herbaria, and several members building up their own reference collections (essential for the serious study of brambles), made the most of the opportunity to collect expertly determined specimens, selected to show the characters of the species in their fullest expression. Brambles are one of the few groups of native plants in which collecting can still be done with a clear conscience, although batologists themselves may sometimes look askance at the billhooks in the hands of their local conservation corps.

A total of 132 records of 33 species in twelve 10km squares were made. Two non-invasive species rare in Wales were refound in localities where they had last been seen by E. S. Marshall in 1899—*Rubus sprengelii* on a dry, scrubby, south facing slope near Llanarth in v.c. 46, and *R. hylonomus* in its woodland refuge in the Monachty Dingle 10km to the north-east. Among the predominantly Welsh or western species, *R. silurum*, *R. bartonii* and *R. leyanus* were especially abundant. The discovery, on a steep slope above Llangrannog, of some inflorescences of *R. incurvatus*, mainly a species of N. Wales that had long eluded some members, led to prodigious feats of clambering in search of first-year shoots to provide the leaves and stem-pieces without which no bramble specimen is complete. Section *Suberecti* eluded both parties until the final day, when four species were seen—*R. scissus* in a characteristic bog-margin habitat near Gorsgoch, *R. bartramii* and *R. nessensis* in recently planted Forestry Commission land (a very useful habitat for brambles) near Trefilan, and *R. plicatus* on Llanybi Common where two of the participants were encamped. A number of undescribed species in Section *Appendiculati* were seen, and three of these were found repeatedly over a wide area and seemed likely candidates for description in the future.

The Welsh Annual General Meeting took place at Lampeter on 22nd July, attended by 27 members, and on the following morning an enlarged bramble excursion took place on the disused railway line at

Pencaerreg. In rain and drizzle, nine species were demonstrated by the leaders and the newcomers received a good impression of the diversity of brambles, the problems of identification and the dedication of batologists. After lunch, the party proceeded to the coast for a visit to Traeth Penbryn east of Aber-porth. Brambles were studied on the lane leading to the beach, and from the beach itself the unusual plant communities on the cliffs were easily seen. Calcareous sand, blowing up on to the boulder clay and silurian mudstone cliffs, provided a common habitat for many species normally found in very diverse habitats. Abundant *Anacamptis* and *Euphorbia portlandica* represented a sand-dune element, *Hieracium caledonicum* and *Euphorbia amygdaloides* represented a cliff and woodland element, *Daucus gummifer*, the prostrate form of *Ligustrum vulgare*, *Anthyllis vulneraria* and others represented a coastal element, and several species rare in western Wales such as *Orobanche hederæ* and *Rubia* were seen. *Calystegia soldanella* was in abundant flower on a small fenced area of dune by the lane.

Bereft of their leaders, a residual group of members visited Falcondale Lake near Lampeter on the final evening and recorded *Potamogeton obtusifolius* new to v.c. 46, and after dinner visited Lampeter churchyard, in which 120 species were recorded including the first record for v.c. 46 of *Hordeum secalinum* and the second of *Brachypodium pinnatum*.

The success of the meeting was in no small measure due to the organizational efforts of the Secretary of the Committee for Wales, who had prevailed upon St David's College to provide, among its other facilities, ample space for evening discussions and the display of bramble specimens, so that the parties could inspect each others' finds, compare techniques of herbarium preparation, watch the tally of records being updated on the blackboard, and revise the lessons of the day.

A. O. CHATER

MYNYDD CILAN, ABERSOCH, GWYNEDD. 2ND SEPTEMBER

A keen group of some dozen assembled on the common by Castell Cilan, south of Abersoch, and spent the morning paddling the many pools thick with *Hypericum elodes*, *Scirpus fluitans* and *Apium inundatum* and searching for *Pilularia*, which at first was small and elusive but at a later pool was seen in commendable abundance. We discussed the identity of the *Sparganium* (surely *S. emersum* from the number of male heads) and admired the abundant *Radiola linoides*, Vera Gordon obligingly finding the companion *Anagallis minima* (a desideratum for this 1km square). We smelled the Chamomile (*Chamaemelum nobile*), and were pleased to see how well the *Deschampsia setacea* was doing. In the afternoon, down by the sea nearer Abersoch, we cautiously examined splendid clumps of *Juncus acutus* and the range of *Dactylorhiza* taxa growing at their base. Here, on an erstwhile *Sphagnum* mire once sporting *Carex limosa* but now spoiled by encroaching mining waste, was an intriguing mixture of *Myrica*, *Cladium* and *Juncus subnodulosus* along with *Linum catharticum*, *Epipactis palustris* and *Centaurium erythraea*. Across the golf-links we lost count of the number of *Spiranthes spiralis* spikes, and then saw the sand-dune specialities: *Vulpia fasciculata* in particular. Abersoch aliens seen included *Artemisia verlotiorum*, *Sisymbrium orientale*, and the locally restricted *Papaver dubium*, *Chelidonium*, and *Silene alba*. Irish ivy was identified, the *Orobanche hederæ* admired, and the elm trees left unnamed. Finally genuine *Vulpia myuros* gave a welcome confirmation of this species for Lleyn.

A. P. CONOLLY

SCOTLAND

FORESTMUIR, ANGUS. 24TH JUNE

Eight members and guests attended the field meeting at Forestmuir. The aim of the meeting was to record in this little worked area of damp unimproved grassland and scrub. The area proved to have a surprisingly diverse flora. This was because the predominantly acid grassland was enriched by base-rich flushes. The most memorable feature of the excursion was a tremendous display of orchids, particularly *Platanthera bifolia* and *Gymnadenia conopsea*. We were also pleased to find *Corallorhiza trifida* in two localities.

None of the 137 species recorded was new to the 10km square, but the richness of the flora was unexpected, both to the participants of the meeting and to the landowners, Kinnordy Estates, to whom we are grateful for permission to visit the area.

R. INGRAM

SOW OF ATHOLL, EAST PERTHSHIRE. 25TH JUNE

The party of 22 members and friends met at the bridge over the Aalt Dubhaig, Dalnaspidal Lodge (by kind arrangement of Mr Kennedy, the Keeper). Members were invited to assist in recording the species of the area and were informed of many likely species unrecorded, on lists made in 1961 and 1967. The main party headed for the shoulder leading up to the north-eastern face of the Sow. They clambered over the morainic heaps, strewing the lower slopes, observing the dominantly acidophilous flora, which nevertheless produced some interesting plants in abundance, including *Carex pauciflora*, *C. pulicaris*, *C. curta*, *Eriophorum angustifolium*, *Narthecium ossifragum* and *Drosera rotundifolia*. *Saxifraga stellaris* was growing in the brightly coloured flushes of *Dicranella palustris*. Common calcicolous species made a sudden appearance as outcrops of native rocks were reached; confusing associations of *Thymus*, *Linum*, *Lotus* and *Viola lutea* along with *Vaccinium* spp. and *Chamaepericlymenum*, etc., were encountered. As an aperitif, *Geranium sylvaticum*, *Lysimachia nemorum*, *Anemone nemorosa* and others indicated former woodland conditions. However the main meal was undoubtedly the wonderful display of *Phylloce caerulea* in flower and fruit along with *Vaccinium uliginosum* and *Loiseleuria procumbens*.

The splinter party, led by Alan Stirling, examined the moorlands to the south of the Sow and the cloud-capped Sgairneach Mhor to the west. They returned with two *Taraxacum* species: *T. craspedotum* from Sgairneach Mhor and *T. pycnostictum* from by the Aalt Coire Luidhearnaidh, both new records for v.c 89. They also found a flowering specimen of *Vaccinium microcarpum* from the latter area. Apart from the *Taraxacum* species only nine species new to the area were found. Surprisingly they included *Ajuga reptans*, *Caltha palustris*, *Plantago lanceolata*, *Rumex acetosella*, *Salix phylicifolia* and *Viola canina*, showing how even well covered areas can throw up unrecorded common species. The total list for the day was 161 species.

Altogether it was a satisfying and productive day for me and one in which I made many new friends.

A. W. ROBSON

BROADFORD, ISLE OF SKYE. 1ST-7TH JULY

Twenty years ago the present V.C. Recorder first met the B.S.B.I. when invited to join the Field Meeting based on Dunvegan, working in N. W. Skye. Since then two other meetings (Broadford in 1966; Raasay in 1969) have checked old records and added new ones. This year, Broadford was again chosen. The checklist (1973) needed revision, and visits to out of the way corners often turn up something interesting. Many quite common plants were still unrecorded from some of the Sleat squares.

The meeting started well when two members did some recording on Saturday around Armadale and Ardsavar. In addition to 20 new records for square 18/60, *Poa compressa* was seen on a wall opposite Ardsavar Hotel, and *Centaurium erythraea* in the stonework of Armadale Castle!

Next day, 14 members met on the Ord road (18/61), and worked in groups, one following the Allt a'Ghasgain to Lochan Fada on the moor above. *Scutellaria minor* was in damp grassland, and *Carex limosa* and *C. lasiocarpa* by the loch. Beyond, on the way to the wooded gorge of the Allt Mor, two members noticed *Drosera anglica* in a wet boggy patch, and looking closer found a minute *Hammarbya*. When others came to admire, three more plants were added. The Allt Mor gorge provided nothing as good. The groups following the road to Ord saw *Carex laevigata* in woodland, and *Arenaria serpyllifolia* and *Valerianella locusta* (already recorded, but both rare in Skye).

After a wet and windy night, the weather on 3rd July improved, and we travelled north to allow those on their first visit to Skye to see *Eriocaulon* near Sligachan, and *Koenigia* below Ben Edra (18/46). Starting in bright sunshine, we reached, at the level where mountain plants first appear, swirling cloud and a very strong wind—confirming the need for winter clothing in July! On the Bealach Amadal the *Koenigia* took some finding—as a result of the drought it was June-sized rather than July-sized, and when found drew cries of disbelief. We managed 15 additions to 18/46 (all common), and the two members who preferred to stay in south Skye (18/71), away from the wind, did much better, with over 40 additions, including more *Carex laevigata* and *Spergularia rubra* (in gravel by the bridge at Kinloch, 18/61).

On 4th July there was still a wintery gale, with breakers rolling in across Broadford Bay. We dodged the worst by reversing our route to Borerraig (18/61), and starting from Camus Malag (18/51) instead of

Suardal (18/62). Two members who tried to record round Camus Malag quickly became soaked and frozen, and wisely retired. The rest reached Suishnish fairly dry, and began recording below Carn Dearg (18/61). The cliffs had been recently burnt, but the vegetation below had survived and included *Agrimonia eupatoria*, *Orobanche alba*, *Rosa* spp., *Stachys ambigua*, and three fine patches of *Vicia sylvatica*. Attempts to photograph the last had no results; both the plants and the photographers were too wind-battered. The lower cliffs and the shore at Dun Borerraig also had several good plants—*Galium verum* (not common in Skye), *Hieracium* spp., *Phyllitis scolopendrium*, some brilliant red *Silene dioica*, *Sedum acre* and *Torilis japonica*.

Wednesday was too wild for Coruisk, or even Beinn na Caillich, and a substitute was found in the grounds of Dunningell Hotel at Kyleakin (18/72), which could have interesting weeds—and did—*Veronica hederifolia*, *V. persica*, and *Vicia angustifolia* among the fine collection of trees and flowering shrubs. Beyond the garden was an extensive salt-marsh which included *Aster tripolium* and *Suaeda*, but added nothing new; and beyond that, on a bank above the inlet, a mixture of garden 'throw-outs' (including *Sedum* spp.) and weeds, with *Fumaria capreolata*, *Myrrhis odorata*, *Sisymbrium officinale* and *Vicia hirsuta*. The afternoon was spent exploring a wooded gorge at the head of the Kyclerhea river (18/72)—apart from some *Salix caprea*, not as good as another gorge in the same square where *Orthilia secunda* was found a month earlier.

The Cuillin ridge was still in cloud when the party reached the Elgol boatslip (6th July), after some minor adventures when one car broke down, leaving one leader stranded in square 18/51 all day (to the advantage of the record card, as *Lycopodium alpinum* was added from Ben Meabost, which also had the only *Arabis hirsuta* seen during the week). Weather improved, and the party divided below An Garbh-choire, three going up to look for an old record of *Tofieldia* (the only locality on Skye)—they did not find it, but returned with a list including *Saussurea*, *Thalictrum alpinum* and an *Equisetum* specimen that, since confirmed as *E. variegatum*, makes a first definite record for Skye (18/41). The rest followed the path to beyond the head of Loch Coruisk, in brilliant sunshine, with all the tops clear, but apart from *Dactylorhiza incarnata* subsp. *pulchella*, saw nothing new until back near the landing stage, where *Lycopus europaeus* was added to 18/41.

An early start for the last day—we had to be at Sconser by 10 o'clock for the ferry to Raasay. There one group went to Brochel by hired car (18/54), while the rest, joined by two Cambridge students, walked from the pier to Inverarish, and in the grounds of Raasay House (18/53). The northern group stopped at Brae to look at the *Orthilia secunda* found there in 1969, but found only one flower. Beyond Brochel we crossed the moor to the coast and back, taking in a couple of lochs on the way. Apart from *Carex lasiocarpa*, *C. pauciflora*, *Orobanche alba* and possible *Dryopteris assimilis*, the extra square records were 'ordinary'. Perhaps enthusiasm was dampened by the heavy drizzle that began after lunch, and made us wetter than any other day of that week.

By the end of the week we had been in and out of 11 squares, and collected over 200 new square records. Many of these were added by M. McC. Webster, who kept to low ground, but had a good eye for grasses, as well as collecting roses and brambles for further study.

C. W. MURRAY & B. S. BROOKES

BARRA, OUTER HEBRIDES. 8TH–15TH JULY

The purpose of this meeting was to record the flora of Barra and adjacent islands. With a party of 16 we were able to split up and visit each of the three 10km squares on a number of occasions. We also had with us some very energetic members who attacked with vigour the more inaccessible parts of the island. We were fortunate in having beautiful weather for nearly the whole week. 392 species plus hawkweeds and planted trees were recorded, of which about 16 are new records based on master cards obtained from Monk's Wood dated 1935 and 1947 onwards. Of these *Juncus inflexus* is new to v.c. 110 and *Rumex longifolius* a second record. *Stellaria graminea* and *Stachys sylvatica* are both very rare in v.c. 110. Other new species included *Cystopteris fragilis*, *Epilobium angustifolium*, *Callitriche hermaphroditica*, *Melampyrum pratense*, *Potamogeton pusillus* and *Sparganium minimum*. On the whole we found Barra deficient in species compared with Lewis, Harris and the Uists, especially the sand dune areas and machair grassland, of which there is very little on Barra.

8th July: Those first to arrive on Barra looked at Halaman Bay and Loch na Doirlinn in the southwest, adding *Botrychium lunaria* and *Carex distans* at Borve Point and *Fumaria bastardii*, *Lamium purpureum* and *Catabrosa aquatica* at Borve village.

9th July: We worked round the south-western shore from Kentangaval through Nask, over Ben Tangaval and down to Loch St Clair which had seven *Potamogeton* species: *P. natans*, *P. gramineus*, *P. perfoliatus*, *P. friesii*, *P. pusillus*, *P. filiformis* and *P. pectinatus*. The following additions were made: *Callitriche hermaphroditica*, *Lycopus europaeus* and *Potamogeton pusillus*. However, other plants of interest not recorded since 1935 were *Ranunculus bulbosus*, *R. trichophyllus*, *Arabis hirsuta*, *Centunculus minimus* and *Hieracium scoticum*, which is on Heslop Harrison's list.

10th July: In low cloud and drizzle we travelled by mini-bus to Port an Lodain, the northermost part of the island. One group worked southwards down the coast to Eoligarry and over Ben Eoligarry while another came down the exposed western shore and then examined the sand dunes. Mrs Clark went to Orosay to look for brambles but before crossing found *Anacamptis pyramidalis*. 17 additions were made to existing records, perhaps the most interesting being *Ranunculus peltatus* and *Alchemilla glabra*. A cuckoo was still calling on this date.

11th July: In brilliant sunshine the whole group took the ferry to Vatersay, divided and worked different parts of this beautiful island. 11 new records were made, of which *Ranunculus peltatus*, *Campanula rotundifolia*, *Rubus saxatilis*, *Petasites fragrans* and *Zostera marina* are some. We refound 73 species on the 1935 card, which were missing from the 1947 list; of these *Hymenophyllum wilsonii*, *Cochlearia danica*, *Ononis repens*, *Ligusticum scoticum* and *Calystegia soldanella* might be mentioned. Looking into the clear water as we returned in the ferry, we noticed that we were travelling over a forest of *Zostera marina*.

12th July: We had the mini-bus on the outward journey and were dropped off in nine groups to record in different parts of the south and east of the island. The best find of the day was *Salicornia europaea* discovered by two groups, one in the Ard Veenish peninsula and one near the village of Bruernish. Another group examined two small patches of woodland, two parties worked in the hills, one finding *Salix herbacea* on all the summits of the Heaval-Hartaval group. One individual looked at the lochs from Loch an Duin to Lochan nam Faoileann, one worked along the road from Crannag to Earsary and another along the shore from near Balnabodoch to Ruleos. Species added that day included *Osmunda regalis*, found by more than one group. We all returned to Castlebay in time to be rowed to Kissimul Castle to be shown around the imposing keep and attractive present day additions within the castle walls, by Mr MacNeil, the clan chief, who had kindly invited us. Vegetation in the courtyard and on the castle walls was noted (total 19 species) including a magnificent display of *Asplenium marinum* near the dungeon.

13th July: We walked from Greian Head along the cliffs then over basic turf and across sand dunes, examined the sandy bay north of Sgeir Liath, followed a brackish stream for some distance, saw a small area of saltmarsh, and re-visited Loch na Doirlinn and Loch St Clair. The following new square records were made: *Sagina maritima*, *Polygonum raii*, *Coeloglossum viride*, *Puccinellia maritima* and *Elymus arenaria*. *Catapodium rigidum* was on the cliff tops and *Ophioglossum vulgatum* and *Coeloglossum viride* were not uncommon, *Gentianella campestris* was occasional and there was a little *Helictotrichon pubescens*. *Catabrosa aquatica* and *Sparganium erectum* were associated with the stream, *Carex distans* with the salt marsh and *Scirpus tabernaemontani* and *Scirpus maritimus* with the loch.

14th July: One group scrutinized Castlebay, noticing the abundance of *Coronopus didymus* and *Anagallis arvensis* as a garden weed. This group continued around the southern coastline and found *Ligusticum scoticum* while examining cliffs and *Juniperus communis* while crossing the saddle between Beinn nan Carnan and Ard Rudha Mor. *Melampyrum pratense* was found on the moorland and *Scutellaria minor* in a damp patch, but the best find of the day was *Juncus inflexus*, a new record, in a lay-by. Another group walked up Castlebay Glen, looking particularly at weeds of cultivation, then up the hill to the Craig before returning to Kentangaval. *Vaccinium myrtillus*, *Veronica officinalis*, *Galeopsis tetrahit* and *Senecio vulgaris* were all noted. Two people returned to Vatersay in search of *Ligusticum scoticum*. One group returned to the north to the Ben Scurrival region and to the south-east of Eoligarry and saw much *Anacamptis pyramidalis* and *Rosa spinosissima*. The remaining three spent a gentler day adding *Teucrium scorodonia* from the Allt Heiker (a rare plant in the Western Isles) and confirming that *Blysmus rufus* still grew at Brevig.

And so ended a very well worthwhile week due in no small measure to the careful preparation and organization of Mrs Murray.

BEINN AN DOTHAIH, ARGYLL. 22ND JULY

The weather forecast for the West Highlands spoke of a wet start to the day followed by clear spells in the afternoon. The rain fell incessantly and, had it not been for the mention of a possible clearance, the Beinn an Dothaidh expedition would, perhaps justifiably, have been called off. 13 botanists, however, gathered at Achalader Farm and headed for the hill into the teeth of a freshening southerly wind which funnelled down from Coire Achaladair.

We made our way up to the 1800ft contour across rather uninteresting wet heathland with *Calluna vulgaris*, *Trichophorum cespitosum*, *Molinia caerulea* and *Myrica gale*, though there were patches of *Carex pauciflora* which was unusually common in some of the wet flushes. Between 1800 and 2000ft the heathlands were drier with *Vaccinium uliginosum*, *V. vitis-idaea*, *Empetrum nigrum* and *Alchemilla alpina* with *Rubus chamaemorus* and *Chamaepericlymenum suecicum*.

The north-facing crags between 2000 and 2700ft support the most interesting assemblages of mountain flowers. Starting at the lower eastern end of these outcrops, and traversing westwards we soon found *Bartsia alpina* along with *Silene acaulis*, *Trollius europaeus*, *Cerastium alpinum*, *Thalictrum alpinum*, *Draba incana*, *Oxyria digyna*, *Saussurea alpina*, *Geranium sylvaticum*, *Galium boreale*, *Polygonum viviparum*, *Coeloglossum viride*, *Juncus triglumis*, *Rubus saxatilis* and *Salix herbacea*. Saxifrages were well represented by *Saxifraga stellaris*, *S. oppositifolia*, *S. hypnoides* and *S. aizoides*, with a number of *S. nivalis*. Ferns included *Cystopteris fragilis*, *Asplenium trichomanes* and *A. viride*, which were common. We were rewarded with the discovery of several plants of *Woodsia alpina*. Amongst the sedges *Carex atrata*, *C. saxatilis* and *C. vaginata* were found growing on these ledges. Content with this, all but five members returned to Achalader Farm. The promised clear spell in the afternoon did not materialize and the deluge continued all day long.

The enthusiasts who remained on the hill made their way westwards and into one of the gullies at around 2600 ft. *Potentilla crantzii* and *Salix phylicifolia* were added to the list, but we did not get the substantial patches of *Cystopteris montana* which had been located on a previous visit.

In spite of the atrocious conditions, most of the members present were greatly impressed by the flora of Beinn an Dothaidh which, on these crags, compares very favourably with parts of Ben Lui.

P. WORMELL

KINDROGAN, TAYSIDE. 26TH JULY—2ND AUGUST. ROSE & BRAMBLE MEETING

Have you ever had to consult the orifice to discover a flower's identity, become sick of a species because it threw up, or had a plant sit up and look at you? If not, book your place now on the next Roses and Brambles course!

These were tips given to help identify members of these two genera, which have always been notoriously difficult. Although tackled in the past, the position in Scotland has been confused to say the least, especially regarding *Rubus*. However, this is now being rectified through the efforts of Alan Newton, who considers there are up to 50 taxa in Scotland—43 named and a few waiting pronouncement. As some of these are distinctly western or southern in distribution, we aimed at 20 for the week.

Despite heavy rain, half that total was reached on the first day in the Stormont Loch/Lowes area, the first—appropriately in a Scottish setting—being *Rubus scissus*. The most common Scottish Sect. *Triviales*, *R. latifolius*, was soon found and subsequently it was seen in practically every locality (and proving very variable). By late afternoon we were thoroughly 'drookit', but so good was Alan Newton's tuition that not one of the party's attention sagged (?sogged) as he explained the reason why *R. mucronulatus* Boreau is so called and not *R. mucronifer* Sudre nor *R. mucronatus* Bloxam—all in very drenching drizzle. On the second day a further three species were found but thereafter they tailed off. A special trip, therefore, was made to Deeside and Howe o' the Mearns and it was enlightening to discover just how much altitude and temperature affect bramble distribution; going down the Dee it was at Bridge of Gairn before the first was found—the aforementioned *R. mucronulatus*, which proved to be just about the only species until we reached Banchory, where *R. echatinoides* turned up. Over Cairn o' Mount and the Brechin-Forfar area *R. raduloides* and, unexpectedly, *R. tuberculatus* were found.

Thus, we came to the last day with 17 species on record, needing three for the magic score. A stroll by the Erich in Blairgowrie brought the awkwardly named introduction, *R. elegantispinosus* and another which could not be named. One to go, and the final trip to Kingoodie, just west of Dundee, raised

hopes. But *R. latifolius* was dominant, until just before leaving when a different patch turned out to be another taxon without a 'proper' name but rejoicing in the temporary identity of 'false *iodnephes*'!

The 20 taxa found were: Section *Triviales*—*R. latifolius*, *R. tuberculatus*, *R. 'false iodnephes'*; *Suberecti*—*R. nessensis*, *R. scissus*, *R. plicatus*, *R. fissus*; *Sylvatici*—*R. nemoralis*, *R. leptothyrsos (danicus)*, *R. septentrionalis*, *R. errabundus*, *R. lindebergii*, *R. elegantispinosus*; *Mucronati*—*R. mucronulatus*, *Rubus* sp.; *Radulae*—*R. radula*, *R. echatinoides*; *Anisacanthi*—*R. infestus*; *Apiculati*—*R. raduloides*; *Hystrices*—*R. dasyphyllus*.

We concluded the week with visits to the Scottish Horticultural Institute at Invergowrie where we saw several alien brambles, as well as experimental plots of cultivated blackberries, and to a commercial grower in the Carse of Gowrie.

As far as the roses are concerned, it is evident from a perusal of the Floras of the earlier part of this century that there was no scarcity of good rhodologists. However, most of them had not shaken off the habit of adding a new name (albeit varietal) to every strange rose they found. It was refreshing therefore to read an account of the 'Roses in Angus', written as far back as 1930 by Mrs Corstorphine. The author was apparently ahead of her time in accepting that much of the variation in wild roses could be explained if one accepted the hybrid origin of many of these so-called 'varieties'. Another factor, which is now more fully understood by those who study roses, is the unique breeding system of this genus, an account of which can be found in summary form in Turrill's *British plant life*.

Both factors were amply illustrated in the rose populations encountered during the course. The first day was spent in searching for and recognizing the few true species present in the area. Good examples were found at Balnaguard and *Rosa afzeliana*, *R. coriifolia*, *R. mollis* and *R. sherardii* were studied. The southern Dog Roses were harder to find and it became evident during the week that *R. canina* and *R. dumetorum* forms were more common in the lowlands and coastal areas. Good examples of both species were seen near Dundee.

At the Loch of the Lowes a very old bush of *R. pimpinellifolia* was encountered, of magnificent proportion. Near it was good *R. mollis* with one bush that appeared to have the parentage *R. mollis* × *R. coriifolia*.

The roses round the field centre were not so easy to elucidate. Although good *R. rubiginosa* was not seen in the vicinity, it evidently supplied the male parentage, or at least some genes, to many of the bushes examined. The *R. mollis* here was not typical but uniform throughout the area. It had very globose fruits, and both fruits and vegetative parts were highly suffused with a purple pigmentation—more mauve than the usual shade imparted by the presence of anthocyanin. *R. afzeliana* and *R. coriifolia* were present from Groups Subcaninae and Subcollinae. Many varieties within these groups are thought to be of hybrid origin even though some appear quite stable. Of good hybrids encountered there were *R. afzeliana* × *R. canina*, *R. coriifolia* × *R. rubiginosa* and *R. sherardii* × *R. rubiginosa*.

Three of the party were successful in recognizing both *R. rubiginosa* and *R. pimpinellifolia* on the dunes at St Cyrus. They also brought back a strange specimen which was evidently *R. rubiginosa* × *R. pimpinellifolia*. It matched well the description in 'Wolley-Dod' of *R. × moorei* which is one of the binomials indicating the above parentage.

Most of the *R. sherardii* bushes studied during the week matched var. *omissa* forma *resinosoides*, but in the interests of clarity no other varieties are mentioned here. However both they and the hybrids encountered reflected extremely well the pattern noted by Mrs Corstorphine in Angus, and W. Barclay in Perth nearly half a century ago.

The dozen participants had a very full week (lab. sessions went on to almost midnight once or twice) and all learned a great deal. This was especially true of the Scottish members who now have the opportunity of carrying out some useful mapping—reasonably confident of *some* of their determinations at least! By the way, the allusions at the beginning to consulting the orifice, and to 'throwing up', refer to the necessity of checking the diameter of the hole left when styles are removed from a rose hip, and to the way in which the sepals erect themselves after flowering. The bramble which 'sits up and looks at you' is *Rubus nemoralis*—which indeed it does, with its flat pink petals eyeing you from the hedgerows. Look out for it next summer.

G. H. BALLANTYNE & G. C. GRAHAM

GLEN GIRNAIG, EAST PERTHSHIRE. 6TH AUGUST

This excursion was officially cancelled due to illness and business commitments abroad of the two

leaders. However, since access permission had already been obtained from Mr C. Findlay, Urrard, three people went independently. We left our vehicles at the entrance to Glen Girnaig, GR 27/916.639, and entered the woodland, which is largely birch with some oak, just beyond this point. Descending to the river through this wood, we crossed several grassy clearings with a good range of species including *Carex caryophyllea*, *Galium verum*, *Helianthemum nummularium*, *Sieglingia decumbens* and *Veronica chamaedrys*. The river forms a gorge at this point; unfortunately high water prevented exploration other than the western side of the gorge. The rocks and wet grassland in the gorge had a relatively rich flora with species such as *Alchemilla alpina*, *Briza media*, *Carex pallescens*, *Rubus saxatilis* and *Saxifraga aizoides*.

Following the Allt Girnaig and its tributary the Allt a' Mhagain, we crossed somewhat uniform *Nardus* grassland and *Calluna* moorland to the crags below Meall an Daimh, an outlier of Ben Vrackie. These were locally moderately rich with *Asplenium viride*, *Botrychium lunaria*, *Cystopteris fragilis*, *Galium boreale*, *Polystichum lonchitis* and *Saxifraga oppositifolia*. Below the crags was a line of stony flushes with *Carex dioica*, *Eleocharis pauciflora*, *Saxifraga aizoides*, *Selaginella selaginoides*, *Tofieldia pusilla* and *Triglochin palustris*.

We then ascended to the col on the Ben Vrackie/Meall an Daimh Ridge, and on the southern side of this latter hill, facing the col, found a small patch of exceedingly calcareous rock with abundant *Astragalus alpinus* together with *Briza media*, *Empetrum nigrum*, *Galium boreale*, *G. verum*, *Helictotrichon pratense*, *Linum catharticum*, *Plantago lanceolata*, *Polygonum viviparum*, *Saxifraga aizoides*, *S. oppositifolia*, *Veronica officinalis*, and also a white *Gentianella amarella* subsp. *druceana*.

R. A. H. SMITH

IRELAND

FERMANAGH. 10TH-11TH JUNE

A total of 12 people took part including two members from each of the Fermanagh and Armagh Field Clubs. During the two days we visited five localities in the west of the county, including areas for which there were few records, and a couple of sites known as localities of probable rare species. These were the shores of Tullynanny and Carran Loughs, an area of scrub and limestone; slopes above Boho; the Black Bridge area near the site of *Erica vagans*; and the woods below the Knockmore cliffs.

Record cards were made for each of these sites. A new county record of *Eleocharis uniglumis* and new stations for *Eleocharis quinqueflora* and *Carex dioica* were obtained at Tullynanny Lough, together with recognition of *Scirpus lacustris* subsp. *tabernaemontani* and *Poa subcaerulea*, neither of which had previously been named in the flora of Fermanagh. The occurrence of *Pseudorchis albida* caused Kodak shares to go up one or two on the Stock Market. Actually it occurs frequently in the west of Fermanagh so much so that Meikle and his helpers stopped recording it in this district. In the afternoon we visited Black Bridge and the Carrickbawn site of *Erica vagans* (where again we found *Pseudorchis albida*). It was here that Maura Scannell found a hybrid *Equisetum* which was originally diagnosed as *E. palustre* × *E. fluviatile* (both of which parents were present). The material was identified by C. Page (E), however, as *E. × littorale* (*E. arvense* × *E. fluviatile*). It is not unusual for this hybrid to be found in the absence of *E. arvense*, and there are now 20 records for the county.

On the Sunday we visited Carran Lough which proved a most interesting area. *Carex acuta* was a new county record and *Geum × intermedium* was recorded for only the third time in the county. *Sisyrinchium bermudiana* found by Norah Dawson created a fair amount of interest. Meikle regards it as a recent introduction and says it is actively spreading in two separate parts of the county. The plant is now locally abundant by Upper Lough Erne. At Pollbeg above Boho Con Breen we found *Meconopsis cambrica*, which is known from cliffs near Boho, and Maura found *Aphanes microcarpa* which proved to be only the second record for the county. *Ophioglossum vulgatum*, the third record for this district (twelfth for the county), was also found.

Finally we moved to Knockmore cliffs where *Geum × intermedium* made its fourth appearance in the county flora! Doubled in one day! So two county records in two days, and a useful increase in the records of many other species, made the whole weekend worthwhile and enjoyable.

R. FORBES

LISTOWEL, N. KERRY. 5TH-9TH JULY

Only a few people attended this meeting, but this did allow more ground to be covered. On 5th July several parts of the Galey River (north of Listowel) were worked. The hydrophyte flora was rather poor, probably due to dredging. *Impatiens glandulifera* was seen and a *Potamogeton* thought to be *P. alpinus* was collected. On Knockanore Mountain *Cytisus scoparius* was seen in some abundance in the stream-gorge and *Dryopteris aemula* was noted in several places on the roadside banks.

On 7th July the cliffs west of the village of Ballyheigue were worked in a vain attempt to refind *Carex punctata*. *Carex distans* was seen there in some plenty. The usual maritime flora was present, including *Anthyllis vulneraria*, *Cochlearia officinalis* and *Malva sylvestris*. At Kerry Head, further to the north-west, *Radiola linoides* was collected on tracks in heathy ground. The cliff form of *Rumex acetosa* was seen in a rocky declivity above the sea. *Ranunculus flammula* approaching subsp. *minimus* Padmore was collected from wet ground near the cliff edge; the only other station reported for this subspecies in Ireland is at Loop Head, South Clare, some 12 miles to the north across the estuary of the Shannon. *Berula erecta* was later collected in a marshy field at Lixnaw.

On 8th July, en route to the coast, *Fuchsia*, *Polygonum cuspidatum* and *Spiraea salicifolia* were seen away from any dwellings on the Knockanore Mountain. A *Lycium* sp. was collected from hedges on the approach road to Beal Point. On the dunes rayless *Senecio jacobaea*, *Asperula cynanchica* and *Anacamptis pyramidalis* were common. A walk along the shore yielded the usual maritime flora. *Carex extensa* was found in a few places, in pools between the rocks, and very hirsute *Bellis perennis* was collected.

On 9th July the Feale River at Listowel was examined. *Juncus foliosus* was abundant on the trampled banks and *Senecio* × *ostenfeldii* was common as it is throughout north-western Kerry. Later the party travelled to Tarbet to cross to South Clare by ferry. The long queue allowed time for botanising the ramparts around the terminal, where *Linum bienne* was found to be common.

In South Clare, as time was short, two lakes near Killimer were looked at, St Senan's Lough and a lake at Knockerry. In the former *Carex curta* was found on *Sphagnum* tussocks and *Catabrosa aquatica* in soft mud in freshwater pools at the edge; these both appear to be new records for the south of the county. At Knockerry, *Isoetes* sp., *Apium inundatum* and *Senecio* × *ostenfeldii* were collected.

M. J. P. SCANNELL

THE NAMES OF VICE-COUNTIES IN *WATSONIA*

The present policy with regard to the use in *Watsonia* of vice-county names and numbers and administrative counties in the British Isles was explained by Halliday & Perring (1976). It is not intended to change this policy, and the vice-county map will continue to appear in every part of *Watsonia* (space permitting), and the vice-county list about once a volume. It has become apparent, however, that, in those cases where the name of the vice-county employed coincides with the name of a town in that vice-county, uncertainty can arise according to whether the town or vice-county is intended. The revised vice-county list on p. 95 sets out to remove such ambiguities.

Although the precise boundaries of the vice-counties in Great Britain as laid down by Watson (1852) have been adhered to rigorously ever since, there has never been an 'official' or universally-adopted list of the names of the vice-counties. The original list produced by Watson (1852) is haphazard in the use of abbreviations (cf. Hunts., Northampton), yet those names were followed exactly by Dandy (1969). The list given by Druce (1932) shows some changes but remains equally inconsistent. The names adopted by Perring & Walters (1962) are more logical, but each county is written in full and adoption of this list in *Watsonia* would not be advisable.

The present revised list is not intended to serve as an 'official' list. It has been constructed by consultation with the regional committees of the B.S.B.I. in Wales, Scotland and Ireland, and the names adopted have been selected with a view to the measure of consistency, brevity and unambiguity required in the pages of *Watsonia*.

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C. A. STACE