

Reports

SPECIAL GENERAL MEETING, 27TH NOVEMBER, 1971

A Special General Meeting of the Society was held in the Department of Botany, British Museum (Natural History) on Saturday, 27th November 1971, during the Annual Exhibition Meeting. The President, Mr D. McClintock was in the chair, and some 150 members were present.

The President said that, due to increasing costs in postage and printing, the Council of the Society with regret deemed it necessary to recommend the following changes in annual subscriptions.

Ordinary members	£3·00 (increased from £2·00)
Family members	£0·50 (remains unchanged)
Junior members	£1·00 (increased from 75p)
Subscriber members	£3·00 (increased from £2·00)

These increases were approved by the meeting.

An amendment was proposed from the floor by Professor J. H. Fremlin: 'That persons who have been members of the Society for 40 years or more should have their annual subscription fixed at the rate current on their attaining 40 years of membership'.

The Treasurer, Mr M. Walpole, informed the meeting that at present 22 members would benefit from this proposed amendment, which was unanimously approved by the meeting.

There being no further business the meeting closed.

I. K. FERGUSON, *Hon. General Secretary*

CONFERENCE REPORTS

ANNUAL GENERAL MEETING MAY 1971

The following three papers are synopses of ones delivered in connection with the Annual General Meeting of the Society held at the University of York on the 8th May, 1971.

VARIATION IN OAKS

The origin of the variational patterns observed within populations of the two British oak species, *Quercus robur* L. and *Quercus petraea* (Matt.) Liebl. was discussed in relation to field and experimental results. It was argued that introgressed oak populations should contain two types of trees:

1. Fertile non-hybrids
2. Relatively infertile F₁ and back-cross hybrids.

Results from five populations in which pollen viability and hybrid status were assessed for each tree suggested that morphologically intermediate trees of suspected hybrid status showed lower percentage pollen viabilities than morphologically 'pure' trees.

Leaf samples from different positions within single oak canopies showed a considerable range of morphological and anatomical variation. Many leaf characters including those which have been used in taxonomic and evolutionary studies followed gradients of light intensity within the canopies such that generally sun leaves were

more *robur*-like and shade leaves more *petraea*-like. Similar results were obtained for oak seedlings under a range of light intensities.

It was emphasised that only with a complete understanding of the factors influencing leaf morphology and anatomy and of the floral biology and reproductive behaviour within oaks could the significance and origin of variation within British oak populations be accurately assessed.

B. S. RUSHTON

POLLINATOR DISCRIMINATION BELOW THE PLANT SPECIES LEVEL

The work reported here is part of a study on the extent to which floral genetic variants can influence the behaviour of pollinators.

In *Pentas lanceolata* (Rubiaceae), a tropical ornamental, variants include long and short style and differences in flower colour and pollen fertility. (This last refers to the proportion of pollen grains having stainable or protoplasmic contents.)

Plots five feet square were set out on the University of the West Indies Campus, Kingston, Jamaica, with six clones each represented by six plants in a randomised arrangement. Using both marked and unmarked bees, visits to flowers together with the forage (pollen or nectar) were recorded. Data were obtained from 336 flights representing 12,367 individual flower visits. Of these, 271 flights were for pollen, 41 for nectar and 24 were of doubtful significance.

Results showed that those clones with the highest proportion of 'good' i.e. stainable, pollen received the most visits. Data gathered over several days with marked bees showed that they either collected good pollen initially or changed over to it during the period of observations. Bees were observed to visit usually only two or three of the six available clones during any one flight.

Bee visits, therefore, particularly among pollen gatherers, were apparently influenced by dissimilarities among the various clones. Such discrimination would only be significant where a plant species is monopolised by relatively few kinds of pollinator.

G. P. CHAPMAN

CALAMAGROSTIS STRICTA AND ITS HYBRIDIZATION WITH *C. CANESCENS*

The world distribution and habitat requirements of *Calamagrostis stricta*, *C. canescens* and *C. stricta* × *C. canescens* were discussed and theories advanced to explain the present British distribution of both species, including the conditions required for the survival of *C. stricta* at the southern edge of its range where climatic conditions are likely to be critical.

Characters of the parents and the hybrid as found at Leven, east Yorkshire, in 1951, were compared. Conditions for hybridization and isolating factors separating the two species were discussed. Following recent drastic disturbance of the habitat and the subsequent extension of hybridization, a biosystematic study of the Leven *Calamagrostis* populations was commenced in 1970. Two distinct hybrid populations were sampled as well as populations of the species and a scatter diagram produced; this diagram was discussed. One of these hybrid populations resembled the 1951 intermediates, whilst the second more nearly resembled *C. stricta* in general appearance, but the position of its individual members on the scatter diagram and the result of examination by hybrid index methods suggested that the population was the result of a backcross to *C. stricta*.

A second scatter diagram for four different British *C. stricta* populations, using the same features as axes, was shown. The position of individuals on this diagram, from at least two of the populations examined, was strongly suggestive of past hybridisation and introgression, as were a number of other observations concerning British *C. stricta* populations.

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The Leven studies are believed to be important in providing the means by which past hybridisation and introgression can be detected, but the problem can only be resolved by the extension of biosystematic studies to include other British *C. stricta* populations. It is possible that hybridisation and introgression have played a significant part in the production of the *C. stricta* variants in the British Isles as well as the probable necessary adaptation to different habitats.

F. E. CRACKLES

TAXONOMY AND PHYTOGEOGRAPHY OF HIGHER PLANTS IN RELATION TO EVOLUTION

The Conference under this title was organised for the B.S.B.I., the Linnean Society and the International Organization of Plant Biosystematists by Professor D. H. Valentine, at whose invitation it was held in the University of Manchester from 9th–12th September, 1971. He also opened the proceedings.

The first three days were taken up with 23 papers given by a distinguished gathering of scientists from Europe, America and Japan. The breadth of topics attracted a wide audience, and each of the sessions was attended by between 180 and 240 people from all five continents. Almost all the papers were of broad general interest and seven of them were related directly to the European flora. The evolution of species in the Aegean region was discussed by Dr W. Greuter (Geneva) for Crete and by Dr A. Strid (Lund) for the Cyclades. Professor C. Favarger (Neuchâtel) surveyed the distributions and origins of endemics in the southern European mountains, and Professor T. W. Böcher (Copenhagen) provided a similar theme relating to the arctic regions of Europe. Dr S. M. Walters (Cambridge) described the pattern of distribution and variation shown by the largely apomictic genus *Alchemilla*. Dr F. Rose (London) discussed the importance of the Somme Valley of northern France in relation to the migration of species into Britain, and concluded that the English Channel had been very much less of a barrier than was often claimed. Dr E. Jäger (Halle) outlined progress in the project to map all the European species; the second volume of their valuable atlas will appear in 1972. A more detailed report of the papers has appeared in *Nature, Lond.*, 233: 309 (1971), and they will be published in full in a volume to be produced by Academic Press.

During the conference a selection of exhibits based on the theme of the conference was staged in the Department of Botany. The exhibitors were: A. Conolly, Leicester (Scanning electron micrographs of seed characters in *Saxifraga*), R. Cotton, Manchester (Polyploidy, morphology and geography in species of *Vulpia*), D. M. Cranston, Manchester (Card index of British chromosome counts of higher plants), D. H. Dalby, London (The status of *Braya linearis* in southern Norway), A. S. Gardiner, Merlewood (Regional population differentiation in *Betula* species), A. J. C. Grierson, Edinburgh (A new Mexican *Anaphalis*?), F. N. Hepper, Kew (Distribution patterns in western tropical Africa), J. N. Mills, Manchester (*Hieracium* section *Alpestris* in mainland Britain), A. J. Richards, Newcastle (The origin of modern dandelions), M. C. Smith, Bristol (The geography of *Sempervivum* in Spain), W. T. Stearn, British Museum (The phytogeographical linkage of tropical America, continental Africa and Madagascar), C. A. Stace, Manchester (Some anatomical characters in the Combrétaceae), P. A. Thompson, Kew (Germination of the seed of *Agrostemma githago* in relation to its success and failure as a weed), D. L. Wigston, Coventry (*Quercus* hybrids in Britain). The library of the University also staged a small exhibition of interesting botanical works, classical works such as Linnaeus' *Hortus Cliffortianus* and Humboldt's *Geographie der Pflanzen* rubbing shoulders with *Flora Europaea* and the *Atlas of the British Flora*. Many people visited the rich collection of the herbarium of Manchester Museum, in which a demonstration of some important old collections, e.g. Spruce's south American types, was held. Other participants took time off to

investigate the plants of some adjacent building sites, where *Senecio squalidus* × *vulgaris* and *Ceratochloa carinata* proved of interest.

On the first evening a reception and sherry party for all conference participants was given by the Vice-Chancellor of the University, and on the second evening the conference dinner was preceded by a visit to The Firs, the experimental gardens and glasshouses of the Department of Botany. Nearly 200 people took part in these events.

On the fourth day about 70 of the participants went on a coach tour of the Peak District, visiting four contrasting sites in this rich and beautiful area. The first stop was on Snake Pass to observe the *Eriophorum* moorland developed on peat at 1600 to 2000 feet. Two dioecious species, *Empetrum nigrum* and *Rubus chamaemorus*, are particularly abundant in areas of peat erosion. The second stop at Burbage Moor was to examine heather moorland at about 1250 feet. *Empetrum* and *Vaccinium myrtillus* and *V. vitis-idaea* were still in fruit, and the continental botanists were pleased to see Atlantic species such as *Erica cinerea*, *E. tetralix*, *Ulex europaeus* and *U. gallii*. After lunch Padley Woods was inspected. These are fine examples of sessile oakwood developed on millstone grit, and support a wide range of habitats of varying moistness. *Corydalis claviculata*, another Atlantic species, and the luxuriant ferns attracted most attention. To contrast with these acid areas the excursion ended with a brief visit to Monsal Dale, one of the botanically rich and famous limestone Derbyshire Dales. Here the marked absence of several southern species was noted, but the presence of northerners such as *Galium sternerii* and *Rubus saxatilis* adequately compensated.

C. A. STACE

FIELD MEETINGS, 1971

ENGLAND

HEREFORD. 9TH-12TH APRIL

On Thursday, 8th April, fifteen members of the B.S.B.I. gathered in Hereford with the purpose of studying the distribution of mistletoe (*Viscum album*) in the county. Five groups were organised and a leader in each group was given a 10 km square of the national grid and instructions to examine each of the 25 'tetrads' in their search. This meant some ingenious planning and occasional rough travelling.

On Friday each group set off independently to criss-cross their 10 km square. In the evening a meeting was held to report the day's happenings, followed by discussion and comparison. Saturday and Monday followed the same pattern except that the personnel had the 'all-change' each day.

By Monday afternoon a picture of mistletoe distribution began to emerge: the centre of the county had plenty of mistletoe but to the north and west it gradually disappeared. The Black Mountains and the absence of trees in them may account for the cessation in part of the west, and Radnorshire with a somewhat similar terrain may be in the same class, though it was found that even when there were orchards it was unusual to find any mistletoe. Breconshire and Monmouthshire have a slightly higher number of records, while Worcestershire and Gloucestershire have plenty. It is not possible to compare the density of mistletoe in these two counties with Herefordshire until a similar survey has been undertaken.

As expected the commonest host proved to be apple (*Malus sylvestris*) followed closely by hawthorn (*Crataegus monogyna*) and poplar (*Populus* spp.). A total of thirty hosts was recorded, the rarest being wych elm (*Ulmus glabra*), birch (*Betula* spp.), hazel (*Corylus avellana*), dog rose (*Rosa canina*) and holly (*Ilex aquifolium*).

The oak of Druid legend is not common as a host, but of the five or six records found about 1860-1870, three are still living; one tree is nearly dead and consequently so is its mistletoe, another found in 1870 is still a beautiful tree with a dozen or more bunches in various stages of growth, the third I have not seen recently but it is reported

well. One known mistletoe oak found in 1869 has apparently conquered its parasite and it is now without it.

It was decided that altitude had some influence on distribution. The usual limit was between 700ft and 800ft but there was one record for 900ft.

Sunday was taken as a 'day off' and a visit to the Great Doward was arranged. This is the only area of carboniferous limestone in the county and *Carex montana*, *C. digitata* and *C. humilis* were found in the old quarries and on the sunny rocks overlooking the Wye Gorge.

The party moved on to the Little Doward later. This is a private estate but permission was willingly given to visit the rocks on which *Hornungia petraea* has been known since 1847. It was very small, perhaps owing to the lack of rain at that time; better specimens were found on another outcrop later.

A few notes were also made on the distribution of holly and *Colchicum* during the weekend.

L. WHITEHEAD

CLIVEDEN AND WINTER HILL, BUCKS. 26TH JUNE

The main purpose of this meeting, attended by 36 members, was to study the grasses on the Cliveden Estate, an area of 263 acres of considerable scenic beauty. It is well-known for its hanging woods, extensive pleasure grounds, natural and planted woodlands and grasslands, partly on chalk and partly on sand and gravel. Permission to explore the Estate was kindly given by the National Trust. The area is rich in grasses, particularly in shade-loving species along the woodland margins and glades, as well as in the coarse grasslands and meadows. *Dactylis polygama* and *Festuca heterophylla*, discovered there on the 1951 excursion of the Society, were still flourishing, the first scattered along the margins of glades, but *Festuca altissima*, found there in 1965 by Mr B. Ryves, could not be located in the time available. The other woodland grasses seen included *Agropyron caninum*, *Bromus ramosus*, *Brachypodium sylvaticum*, *Festuca gigantea*, *Melica uniflora*, *Poa nemoralis* and *Milium effusum*.

The journey to Winter Hill was broken at Cookham to examine a small area of low-lying grassland and stream-margins where, among other aquatics, *Glyceria fluitans*, *G. plicata*, *G. maxima* and *Phalaris arundinacea* were noted. The steep slopes of Winter Hill, now becoming overgrown with thorns, roses, etc., provided a good mixture of the species found in chalk grassland, including *Bromus erectus*, *Briza media*, *Dactylis glomerata*, *Festuca rubra* subsp. *rubra*, *Helictotrichon pratense*, *H. pubescens*, *Koeleria cristata* and *Poa angustifolia*. In the adjacent Quarry Wood, the usual shade grasses were seen, with the addition of *Hordelymus europaeus* and the rare *Bromus benekenii*. The latter was growing with *Bromus ramosus*, but was readily distinguished by its more slender growth, less hairy leaf-sheaths, and contracted nodding panicles, with shorter branches.

During the day, fifty-one species of Gramineae and various varieties and forms of these plants provided those taking part with a wide range of the British grasses.

C. E. HUBBARD

GUERNSEY. 9TH-18TH JULY

Well over 100 people have attended the three annual field meetings in Guernsey and the fillip to our knowledge of the island's botany has been immense. How could the two eyes of an Englishman on his holidays hope to see a fraction of what these two-hundred plus eyes could and did see. Any way, largely thanks to the efforts of these visitors, and to the intrinsic richness of the island's flora, a promising basis now exists for a reasonable account of its wild flowers.

This year's visit followed the pattern of the past two. The attendance however was slightly down because the date was a week too early for most schools. But, as before, there was widespread evidence of enjoyment of the island, its weather, its flowers

and the accompanying company. The activities of the visitors were twice featured, with photographs, in the local press and once in the Jersey paper. The opening meeting, joint with the Société Guernesiaise, had an address by the leader on the history of Guernsey botany, which ended up picturesquely with some of John Bichard's superb slides of its flowers. Recent discoveries have already invalidated some of the statements made at the lecture, notably in that it now seems the excellent Joshua Gosselin was no botanist!

The great failure of all concerned, the leader worst of all, who after all had been at the original discovery of the British Pteridological Society meeting on the 22nd April (see p. 204), was to find no fresh tufts of the new *Asplenium* × *sarniense*. One reason doubtless is the baffling difficulty of distinguishing it from *A. adiantum-nigrum*, but another may well be that it is not common, for suitable hedgebanks with both parents proved to be surprisingly scarce. But considerable efforts were made to find it, with authentic specimens and Dr Sleep's own notes in the car and consulted on the spot. But against this, two more stations were added for *Microsorium diversifolium*, both under trees, and three more for *Cyrtomium falcatum*.

Perhaps the best find was made by Mrs Garratt when she found a small colony of a broomrape with pale yellow stems and lavender blue flowers just off Bulwer Avenue; and a similar colony was found a few days later a few hundred yards to the north by the St Sampsons Quarry. Attempts to trace its host in the dense turf were unsuccessful, but its bracts, and yarrow nearby, suggested it might be the long-lost *Orobancha purpurea*; and so Dr Hambler confirmed it to be. But who has ever seen this plant in these colours?

Next best I think was the pleasure Miss Caddick gave on the first evening, when she produced *Gastridium ventricosum* from the Rue du Gain in St Peters, which was matched shortly after when Dr Taylor found a single plant by the St Peters Post Office, a mile and a half away. Only one other record was then known of this plant during this century. A close third was the nearest to *Hypericum linarifolium* seen for very many years. Until recently I knew of no proof of this species occurring in Guernsey at all, all the vouchers being of intermediates. But now two valid collections are known, in 1881 and 1894, from Moulin Huet. The species has been claimed on numerous occasions, the position being aggravated by a majority (? all) of the island's *H. humifusum* being of the var. *decumbens* with glandular sepals. It is possible that some at least of these intermediate plants may come under its var. *ambiguum*, of Gillot—and these intermediates are still regularly seen. This year's discovery was made by Mr R. D. English near Kings Mills, his specimen being first thought by Dr Robson to be pure *H. linarifolium*, an opinion subsequently modified to 95%—and this is the first record away from the south cliffs. Just as good, if not even more welcome, was a species long-sought in the island and hitherto always claimed in vain. But Mr Milne-Redhead collected willowherbs, and Dr T. Pennington confirmed that two gatherings were, at last, *Epilobium adenocaulon* and there were also some hybrids.

There was a single war-time record of *Alopecurus myosuroides*, but Miss Sturdy and Miss Caddick found it in two places in July, neither rediscovered, so it cannot be plentiful. I knew no record of *Knautia arvensis* since the *Flora* of 1901, so when I was sent by Miss Mauger to the Blicqs area, even the single plant I saw gave me great satisfaction—and more were seen later. Hornworts had been rarely and unsatisfactorily recorded and only one specimen existed, which proved to be wrongly named. So the only indubitable *Ceratophyllum demersum* is what was in the goldfish pond at Four Cabot—and *C. submersum* was in a similar pond at the Grange Hotel. But such plants are only aquatic oxygenators prospering.

All the new species found were aliens, casuals or escapes although the status of at least two more was more permanent. Lady Anne Brewis lit on a glorious billow of *Vicia varia* at the edge of the St Sampsons Quarry; and Mr J. B. Marshall proved it was *Senecio grandiflorus* which was thickly established in grass near a garden, and had sown itself further down, at Fermain Bay and was also in a grassy field at Haute-

ville. Mr E. Milne-Redhead early on pointed out to us that *Calystegia* × *lucana* was apparently widespread. Here it is in various guises, but not always certainly distinguishable from forms of one or other parent. He and Mr C. Hare found a lovely *Sisyrinchium*, cowering under a burdock leaf by a dump, which he later proved to be *S. iridiflorum* from South America, not known to be in cultivation. *Solanum dulcamara* was seen with all its leaves richly edged with a cream colour, *Antirrhinum majus* in a striking pink and yellow peloric form, and *Epilobium palustre* with white flowers. *Portulaca oleracea* had gone from its only known garden, so it was very satisfactory when Mrs Holland found it in plenty in another garden in the Vale, where it had been known for many years. It is frequent in Jersey, so why not here too? *Solanum ottonis* was feared to have gone, but was happily refound hiding safely behind a shed. *Selaginella kraussiana* was not to be seen in either of its previous localities, so its discovery in the Fermain Valley was particularly welcome.

As usual we are indebted to several specialists who have dealt with critical material. It was comforting that even Dr Brummitt was puzzled where to place the dozen or so gatherings of pink-flowered *Calystegia*, which seemed to cover the whole gamut from *C. sepium* to *C. pulchra*, and included a schizopetalous form from Perelle found by Lady Anne Brewis. She also most carefully made several collections of *Rubi*, but few could be named. Clearly the Channel Island's brambles are as special as we thought and need special study. A *Euphrasia* from L'Ancrese Dr Yeo agreed came close to *E. stricta*—but none of us is yet sure of recognising this in the field. Channel Island *Euphrasias*, notably *E. tetraquetra*, also seem to differ from English ones. Miss M. E. de Putron proved to be a local devotee of old Roses and named from Fort Saumarez the 'Apothecary's Rose', and 'May Queen', which have thriven in the scrub there in full face of the sea for well over 40 years; and 'Seven Sisters' and 'Jean Guichard' were doing the same on a low cliff at Cobo. And the prettiest plant of all? Large-flowered, very dwarf (because it was eaten down by goats) *Dianthus armeria*, a very rare plant in the island and in quite a new locality here on L'Ancrese, jewels in the sun, much better than when they are on long thin stalks!

Of course there were lots, and lots, more. But the leader is sincerely grateful for the excellent work of this excellent company. He still hopes to repay it with an account of the flowers in 1973.

D. McCLINTOCK

LEWES, SUSSEX. 16TH–18TH JULY

The ancient county town of East Sussex attracted twenty-six members and friends to devote a weekend to an area which provided a good range of habitats and plants.

In warm sunshine, seventeen 'tetrads' were visited, with an overall total of nearly 4000 records being made, including *Erucastrum gallicum*, *Callitriche platycarpa*, *Scandix pecten-veneris*, *Torilis arvensis*, *Nymphoides peltata*, *Chrysanthemum segetum*, *Silybum marianum*, *Baldellia ranunculoides* and *Alisma lanceolatum*.

The Sussex Flora Committee is grateful to all who contributed to this most worthwhile meeting.

P. C. HALL

PECKFORTON HILLS, CHESHIRE. 1ST AUGUST

A party of eight enthusiasts and friends gathered at Gallantry Bank near Harthill, Cheshire to study the local *Rubus* flora. A key to the local species, which was being used in the field for the first time, was provided. After making initial acquaintance with *R. ulmifolius* and section Triviales in the hedgerow the first stop was made at Higher Burwardsley where bushes of the widespread *R. dasyphyllus*, *R. selmeri*, *R. lindleianus* and *R. cardiophyllus* were present in sufficient quantity to enable some of the salient points of *Rubus* physiognomy to be studied, along with *R. incurvatus*, primarily a bramble of North Wales, and *R. adenanthoides*, a local species common in this area of Cheshire.

Lunch was taken at Gallantry Bank and further acquaintance was made with the four widespread species which together with *R. carpiniifolius*, *R. sprengelii*, *R. robii*, *R. polyanthemus* and *R. murrayi* grow on the rough slope above the road. Here the opportunity was taken to study the growth forms of the different plants in favourable circumstances free from lopping and cutting, and various field characters were demonstrated. *R. murrayi*, which is a rare species in the county and apparently at the northern extremity of its range, was first found here by A. H. Wolley-Dod c 1895 (as *R. adornatus*) and was collected by H. J. Riddlesdell in 1926. It still thrives.

The lane from Harthill to Dropping Stone house was then visited where, on either side, the brambles were in excellent condition but care was necessary to associate correct panicles with non-flowering stems. This is the type of locality for *R. adenanthoides*, which was well shown together with *R. hylocharis*, *R. lindleianus*, *R. polyanthemus*, *R. robii*, *R. castrensis*, and the high-arching purple prickly stems of a plant indistinguishable from *R. curvispinis* W.C.R. Wats., which had the previous week been the subject of close scrutiny on the southern borders of the New Forest. A certain sense of familiarity now having been achieved with these plants, a disused railway bank near Handley was visited where several species grow in great luxuriance and quantity, including the newly described *R. wirralensis*, together with *R. vestitus*, *R. rubristylus*, *R. murrayi*, *R. leightonii* and *R. wolley-dodii*, in addition to *R. ulmifolius* and plants belonging to the section *Triviales*. Exploration and explanation here took longer than anticipated, it was a warm afternoon and the party deemed it wise to return to Gallantry Bank where two members graciously dispensed tea from the rear of a Dormobile, fully equipped with all the necessities for a botanist's intellectual and physical comfort.

The key was voted a cautious success, 21 of the 28 species described were seen, and it was encouragingly evident from the zeal shown in collecting and concentration particularly by the younger members that *Rubus* studies will not be neglected in the future.

A. NEWTON

THETFORD, NORFOLK. 6TH-8TH AUGUST

Twenty-six members and guests gathered at the Anchor Hotel, Thetford, on the evening of 6th August to receive the plan of campaign for the weekend. Six parties were assigned for field mapping the following day; an introduction to the terrain was given by P. Wright, Deputy Regional Officer of the Nature Conservancy, and some colourful slides were shown by Miss G. Tuck of the landscapes and species peculiar to the district.

Each party was given two 1 km squares to survey, for which not only an indication of presence but also a coded statement of habitat and frequency was required for each species. It is open to question whether the results of this procedure will justify the elaborate and arduous recording burden involved for each square, since every estimate of frequency and habitat will be subjective. The 'frequent' of one recorder may easily be synonymous with the 'common' of another, the 'wood border' of one may represent the 'scrub' of another and so on. It is arguable in any case whether the various habitat categories used are so clearly delineated in nature.

Those squares now occupied exclusively by even-age conifer stands were found to yield only 70-100 species, but those which include more open rides, an arable field or two, a few roadsides and a damp spot can achieve 150+. The commonest plants of clay soils, e.g. *Prunella vulgaris* and *Ranunculus acris*, are exceedingly scarce, ferns are rare, *Rubi* are confined to the most widespread species such as *R. selmeri*, *R. polyanthemus*, and the bird-sown *R. procerus*, but xerophilous species such as *Koeleria cristata*, *Knautia arvensis* and *Ornithopus perpusillus* are widespread, and *Medicago falcata* was visible in abundance.

Some heavy showers were experienced but representative lists were produced and

enough specimens to exercise diagnostic capacities until 10 p.m. on the Saturday. The Euphrasias in particular are a puzzling group in Breckland.

On the Sunday a comprehensive tour of Breckland localities was arranged by Mr Wright and Miss Tuck during which most of the specialities of the area could be seen. At Barnham Cross Common *Artemisia campestris*, *Phleum phleoides*, *Silene otites* and *Turritis glabra* were all in excellent condition and the close association of *Cirsium acaulon* and *Helictotrichon pratense* with *Senecio sylvaticus* was an interesting feature. *Veronica spicata* and *Dianthus deltoides* were admired near Weeting, where a project for the study of reversion from arable to breck was described by Mr Wright. Plots of some scarce and local species raised from seed are also maintained here.

At Lakenheath, where the chalk is very near the surface and the soil is very thin, a most interesting community was seen containing predominantly lichens but also *Galium verum*, *Astragalus danicus*, *Asperula cynanchica*, *Gentianella amarella*, *Carex ericetorum*, *Botrychium lunaria* and *Silene otites*. Near Eriswell, two colonies of *Scleranthus perennis* and one of *Thymus serpyllum* were visited. In one place the presence of American children illustrated the precarious conditions in which the former species must rely: the open conditions induced by scabbling feet will encourage vigour so long as the insignificance of the flowering plant protects it from depredation.

Several members enquired about the publication of their efforts and it is to be hoped that the Breckland group will not be content to retain these data within the sterile confines of computer storage but will make every effort to publish at least distribution maps for the species present in this most interesting area, and thus make its features accessible to a wider public.

A. NEWTON

ALIEN HUNT. 25TH-26TH SEPTEMBER

With the aid of a hired coach, forty-five BSBI/London Natural History Society members explored four refuse-tips to the east of London. All the sites proved to be of considerable interest and much more time could have been profitably spent on each, but rapid inspection of the more promising areas provided an excellent assortment of unusual aliens.

BARKING TIP, ESSEX. Members soon familiarised themselves with a wide variety of typical bird-seed aliens including *Melilotus indica* and *Guizotia abyssinica* in full flower, while among the less common species were *Lythrum junceum* (= *L. meonantherum*), *Cicer arietinum* (Chick Pea), *Vicia villosa* subsp. *varia*, *Amaranthus quitensis* and *Solanum rostratum* (a prickly plant with large yellow flowers which pleased the photographers). An immature plant, probably of *Achyranthes aspera*, was spotted, but still awaits final determination. Two thrills, even for the experts in the party, were the American grass *Brachiaria platyphylla* (only the second British specimen that Dr C. E. Hubbard has encountered) and the Cucurbitaceous *Momordica charantia* (det. C. Jeffrey). A small white-flowered Umbellifer with filiform leaf-segments turned out to be *Cuminum cyminum*. *Cleome spinosa* was a pretty sight, although somewhat smaller in all its parts than the plant in cultivation. *Phalaris minor* and *Bidens pilosa* were spotted by a few sharp eyes. Both the annual *Sorghum bicolor sensu lato* and the rhizomatous perennial *S. halepense* were present. Two aliens well-established in the neighbourhood, *Hirshfeldia incana* and *Sisymbrium loeselii*, were also noted.

DAGENHAM TIP, ESSEX. The tipping of ashes from the foundry of the Ford Motor Works has provided an outstanding example of an established alien flora community the composition of which has probably remained relatively unchanged since first observed at Dagenham by Mr J. E. Lousley in 1934. *Salsola pestifer* still dominates large areas of ground, with scattered colonies of *Amaranthus albus*, *Sisymbrium loeselii* and *Solanum sarrachoides* breaking the monotony. A few plants of *Abutilon theophrasti* (fruiting well) and one clump of *Hordeum jubatum* were also found. *Rumex patientia* and *Heracleum mantegazzianum* were frequent nearby.

NORTHFLEET TIP, KENT. Lone plants of *Trigonella corniculata* (not unlike a small Melilot) and *T. foenum-graecum* aroused considerable interest, as did some tiny plants of *Plantago afra* (= *P. psyllium*; det. C. C. Townsend), a plant which has probably been sometimes mis-named as *P. indica*. *Amaranthus blitoides*, *Aptenia cordifolia* (leaves only, but the root was grown on in a greenhouse and the flowers have confirmed this name), *Digitaria sanguinalis*, *Hibiscus trionum*, *Reseda alba* and *Salvia reflexa* were also found. The opportunity to compare *Setaria geniculata* with the similar *Setaria lutescens* which was growing a few yards away was appreciated.

CRAYFORD TIP, KENT. Three grasses, *Urochloa panicoides*, *Panicum laevifolium* and *Echinochloa colonum*, were eagerly collected, the first-named being much the scarcest species on our tips. *Ridolfia segetum* (distinguished from the similar yellow-flowered Umbellifers Fennel and Dill by its much smaller fruits—only about 2mm long), *Ammi visnaga* and *Vigna mungo* (Mung Bean) were also seen. The tip terminated within a few yards of a colony of the native *Sonchus palustris*, but we were able to confirm that the plants were not in any obvious danger.

The following day a small party of six members leisurely explored three tips to the north-west of London, none of which was found to be rich in aliens.

SHEPPERTON TIP, MIDDLESEX. Several plants of *Agrostis scabra* were the highlight here, although it was pleasing to see *Arachis hypogea* (Peanut), *Lens culinaris* (Lentil) and *Brassica juncea* (frequent on tips but easily overlooked).

IVER TIP, BUCKINGHAMSHIRE. *Polygonum pulchellum* and the rampant garden *Comelina coelestis* (presumably) were found.

GERRARDS CROSS TIP, BUCKINGHAMSHIRE. Some fifty plants of *Trachyspermum ammi* was a remarkable sight here (although nowadays frequent on tips numbers are usually small). Two very large fruiting specimens of *Anethum graveolens* (Dill) and a colony of *Kochia scoparia* also attracted attention, but a plant of *Physalis ixocarpa* which was present on a previous visit had unfortunately been destroyed.

ACKNOWLEDGMENTS

The leaders would like to express their thanks to the Greater London Council and the Ford Motor Company Ltd. for their kind permission to visit the land-reclamation sites and to the staff at the Royal Botanic Gardens, Kew, for help with determining specimens.

E. J. CLEMENTS & T. B. RYVES

WALES

MEIFOD, MONTGOMERYSHIRE. 22ND MAY

Members of the B.S.B.I. were joined by members of the Montgomeryshire Field Society at Pont Robert, where they were met and conducted around the Pendugwm woodlands by the owner, Mr Langshaw Rowland.

The woods cover some 244 acres and contain a variety of species including many fine beeches. In 1970 about 8 acres were generously donated to the North Wales Naturalists' Trust and Montgomeryshire Field Society by Mr Rowland, a former President of the Royal Forestry Society. He gave an interesting talk, and impressed members by his desire to enhance the beauty and wildlife interest of his woods and to encourage the recording of the plants and animals they contain. A 'Linear Arboretum', containing 46 exotic tree species, mainly from the Pacific coast of N. and S. America, has been created alongside a woodland track. The ground flora has been

recorded by Mrs W. R. Parr. On this occasion a colony of *Ophioglossum vulgatum* and a fine stand of *Equisetum sylvaticum* were noted.

A bog at Llanfihangel where *Dactylorhiza incarnata* has been found was visited next. Unfortunately the bog had been burnt, but, even though it was too early to identify all the remaining species, the area obviously merits a further visit. It was rather surprising to see such an abundance of *Vaccinium oxycoccus* still in fruit.

V. J. MACNAIR

WEST RADNORSHIRE, 19TH JUNE

This was a joint meeting with members of Hereford Botanical Society, attended by 19 people.

A visit was first made to see a colony of *Dianthus deltoides*, unfortunately not quite in flower, on an outcrop of igneous rock near Llansantffraed-in-Elvel Church.

The party then moved on to a valley bog, known locally as the Cors, near Cefnbychan farm, where the main purpose of the meeting was to record the area for a report to the South Wales Region of the Nature Conservancy on its possible interest.

Mr P. Thomson gave a brief outline of the geology and possible origin of the bog, and provided sketch maps. This valley is very secluded at 775–800 ft and enclosed by hills. On the west of the Carneddau range of shales and volcanic rocks of Ordovician age rise to 1458 ft and on the east Gilwern hill and Castle bank, 1254 ft.

The bog covers the shallow peat-filled lake and shows well the transition from fen through areas of *Phragmites*, *Juncus*, *Menyanthes* and *Carex rostrata* to a type of raised bog with *Sphagnum*.

In a grazed meadow bordering the bog were quantities of *Platanthera bifolia*, also *Dactylorhiza fuchsii* with *Genista tinctoria*, *G. anglica* and *Cirsium dissectum*. *Dactylorhiza maculata* subsp. *ericetorum*, *D. incarnata* and *D. incarnata* subsp. *pulchella* were nearer the bog, and a good deal of time was spent discussing possible hybrids.

The *Sphagnum* areas produced *Pinguicula vulgaris* and *Drosera rotundifolia*. Also noted were *Lythrum salicaria*, *Scutellaria galericulata*, *Ranunculus lenormandii* and *Potentilla palustris*.

A. C. POWELL

LLEYN PENINSULA. 3RD–4TH JULY

The leaders on both days were Dr W. S. Lacey and Miss Ann Conolly. On Saturday 3rd July, 14 members visited the National Trust property at Porth Ysgo and the cliffs around Gallt y Mor. *Geranium sanguineum* and *Rubia peregrina* were abundant and in full flower; *Carex punctata* was confirmed, growing on the cliffs with *C. distans*. *Crambe maritima* was also observed on the cliffs—an unusual habitat for it?

Mynydd Cilau was visited next and several interesting aquatics, including *Pilularia globulifera*, were seen in the pools.

On the following very wet Sunday morning 15 members assembled in Rhyd-y-clafdy to explore Cors Geirch. Many of the typical fen species were seen: *Cladium mariscus*, *Juncus subnodulosus* and *Schoenus nigricans* were common and *Selaginella selaginoides*, *Utricularia intermedia* and *Hypericum elodes* frequent. *Dactylorhiza traunsteineri* was still in flower.

The day concluded with a visit to the coastal heath at Cwmister, between Morfa Nevin and Tudweilog. Much of the heath had disappeared due to ploughing and re-seeding with rye-grass and clover, but *Cicendia filiformis* remained in small quantity in ruts and vehicle tracks.

The leaders wish to express their thanks to Mr A. Vaughan Jones and Mr R. H. Roberts for help with these excursions.

W. S. LACEY

SCOTLAND

FLANDERS MOSS, PERTHSHIRE. 30TH MAY

The 23 participants assembled at South Flanders Farm at 11.00 hrs in rainy weather which improved enough to make the work amenable. Carrying numerous items of peat boring gear the party proceeded on to the raised bog where some four hours quickly passed.

First, brief attention was given to the flora of the mire which supports, as is well-known, *Andromeda polifolia* and *Ledum groenlandicum*. During lunch the leader expatiated on the geological and vegetational history of the area as revealed not just by the work of Durno, Turner and Sissons, but also by Cambridge radiocarbon dates.

With the help of sturdy research students from the University of Edinburgh, the leader used three types of peat samplers to reveal the stratigraphy of the mire; at the point studied, some 3m of raised bog peat overlies c 0.25m of wood/fen peat on c 7.50m of Carse Clay which rests on a lower layer of oligotrophic peat.

Plant remains in the uppermost 3.50m were identified where possible. Embedded in the top of the Carse Clay were seeds of *Suaeda maritima* (det. Mrs C. A. Dickson), a species with few fossil occurrences.

After a vote of thanks handsomely delivered by Dr W. W. Newey, the party took leave of the mire. This time sundry peat and clay samples were additional burdens.

J. H. DICKSON

ACHNACREE MOSS, BENDERLOCH, AND GLEN LONAN, TAYNUILT, ARGYLL. 13TH JUNE

There was an attendance of 11 at this meeting, organised by the C.S.S.F. jointly with the Andersonian Naturalists of Glasgow.

Before lunch an area of acid bog in Achnacree Moss was visited, from which 74 species were recorded. *Drosera anglica* and *Isoetes lacustris* were the most noteworthy. Later in the day, in the less acid conditions of upland pasture in Glen Lonan near Taynuilt, *Trollius europaeus* and *Saxifraga hypnoides* were the most interesting plants in a total of 82 species.

E. R. T. CONACHER

LETHANS DEN AND KNOCK HILL, FIFE. 19TH JUNE

The main object of the meeting, attended by two members and two guests, was to attempt to rediscover a number of rare species recorded over a century ago. This met with only limited success, for unfortunately the most sought after were not seen, among them *Cryptogramma crista*, *Thelypteris phegopteris*, *Equisetum hyemale*, *E. pratense*, *Drosera anglica* and/or *D. intermedia*, *Pyrola media*, *P. rotundifolia*, *Paris quadrifolia*, *Gymnadenia conopsea*, *Leucorchis albida*, *Carex paupercula* and *C. pauciflora*. In compensation, however, several species uncommon in Fife were seen. The upper part of the Den yielded *Rubus saxatilis*, *Melampyrum pratense*, *Carex hostiana* and *C. pallescens*, and in the wooded area about the waterfall (Swallow Craig Den) there were sheets of *Stellaria nemorum* and a few shrubs of *Corylus avellana* and *Viburnum opulus*—both rare as natives. In the meadows by the Black Devon River were *Trollius europaeus*, *Cirsium heterophyllum*, stands of *Carex acutiformis* and a little *C. paniculata*, and on shady banks *Thelypteris dryopteris*. Clumps of *Rumex alpinus* were also present further downstream.

Time did not permit an ascent of Knock Hill (a later visit indicated that intensive grazing seemed to have eliminated likely plants), but a brief survey of neighbouring Din Moss revealed *Vaccinium oxycoccus* and, sparingly, *Trientalis europaea* and *Dryopteris carthusiana*. It took a further visit to come across *Drosera rotundifolia* in very small quantity. The hybrid orchid *Dactylorhiza maculata* subsp. *ericetorum* × *D. purpurella* was also noted.

A total of some 200 species was recorded for the appropriate 5km square of 36/09 during the day, including over 100 additions to that square, which, like most Fife squares, was badly under-recorded for the *Atlas*.

G. H. BALLANTYNE

MEALL GHAORDIE AND CREAG LAOGHAIN, PERTH. 20TH JUNE

The objects of this meeting, held jointly with the Perthshire Society of Natural Science, were to compile data for the rare species survey on *Cystopteris montana*, *Salix lanata*, *Veronica fruticans* and *Bartsia alpina*, and to compile records for the 5km grid square 27/54 SW.

The meeting as advertised had to be cancelled owing to the very unfavourable conditions prevailing on the morning of the 20th June for a mountain excursion. The only visiting member and a small party of P.S.N.S. members covered instead, between heavy showers, a short stretch of the River Earn near Crieff, making additions to the 5km square card.

A visit was however made on 4th July to the location advertised attended by 12 persons, a member of the P.S.N.S. and the leader representing the B.S.B.I., and an attempt was made to carry out the objects of the original meeting. In deteriorating weather conditions *Cystopteris montana*, *Veronica fruticans* and *Bartsia alpina* were seen on the cliffs of Creag Laoghain, the latter in full flower, but it was impossible to adequately complete the Rare Species Survey as required. Another visit will be necessary. Most of the commoner alpine species and many lowland ones were nevertheless recorded for the P.S.N.S. 5km square records.

A. W. ROBSON

KINDROGAN FIELD CENTRE, PERTHSHIRE. 23RD-30TH JUNE

This course on Mountain Flowers was attended by 16 persons, most of whom were B.S.B.I. members. On the evening of the 23rd the party was welcomed by the Warden, Mr Brian Brookes, and a programme for the week was discussed. It was arranged to have an excursion each day to a place of particular interest.

On 24th June Ben Vrackie (2757 ft) was climbed by the track from Moulin, Pitlochry. During the approach across moorland above 1000 ft species of local occurrence noted were *Trientalis europaea*, *Antennaria dioica*, *Listera cordata*, *Tofieldia pusilla*, *Juncus triglumis* and *Eriophorum latifolium*, while on a crag near the path at 1650 ft were *Arabis hirsuta*, *Helianthemum chamaecistus* and *Rubus saxatilis*. Of special interest near the summit were *Astragalus alpinus*, *Oxytropis halleri*, *Potentilla crantzii*, *Draba incana* and *Cerastium alpinum*, and a number of other montane plants were also noted.

The Cairnwell (3059 ft) was climbed on 25th June from the highest point of the 'Devil's Elbow' road (A93), after the party had stopped in Glen Shee to see fine colonies of *Meum athamanticum*. During the ascent *Rubus chamaemorus*, *Chamaepericlymenum suecicum* and *Vaccinium uliginosum* were seen on east-facing slopes, with *Juncus trifidus* and *Carex biglowii* on the more exposed parts. On a small outcrop of limestone *Minuartia rubella*, *Dryas octopetala*, *Polygonum viviparum* and *Carex rupestris* were seen.

On 26th June the party joined the Alpine Section of the Botanical Society of Edinburgh in an excursion to Glas Tulaichean (3449 ft), approaching from the head of Glen Fearnach and finding *Betula nana* en route at about 2500 ft. On an outcrop of lime-rich crags at about 3000 ft were *Trollius europaea*, *Silene acaulis*, *Saxifraga hypnoides*, *S. oppositifolia*, *Salix lanata*, *Carex atrata* and *Poa alpina*.

The rocky slopes rising from the east shore of Loch Loch were visited on the 27th June. Among the species found, mainly between 1600 and 1800 ft, were *Draba incana*, *Arabis hirsuta*, *Helianthemum chamaecistus*, *Geranium sylvaticum*, *Oxytropis cam-*

pestris, *Potentilla crantzii*, *Galium boreale*, *G. sternerii* and *Veronica fruticans*. The *Oxytropis*, which is well established here, was flowering in profusion and great beauty.

Glas Maol and Caenlochan Glen were visited on the 28th, the approach being made from the 'Devil's Elbow' road once again. On Glas Maol the more noteworthy plants seen were *Veronica alpina*, *V. humifusa*, *Juncus castaneus* and *Alopecurus alpinus*, while on the well-known cliffs of Caenlochan most of the montane plants for which the area is noted were seen, including *Thlaspi alpestre*, *Dryas octopetala*, *Salix lanata* and *S. myrsinites*.

The last day of the course was devoted to Ben Lawers (3984 ft), which was climbed from the National Trust car park and information centre on the slopes of Ben Ghlas. A large proportion of the plants for which the Ben is well known were seen, including good specimens of *Saxifraga cernua*. Unfortunately, persistent cold weather seemed to have hindered the flowering of some species, e.g. *Gentiana nivalis*.

It is fitting to remark that the kind co-operation and help given by Mr Brian Brookes and his staff contributed greatly to the success and enjoyment of the course.

J. GRANT ROGER

INVERGARRY, INVERNESS. 10TH-17TH JULY

Eleven members and friends explored the neighbourhood of Glen Garry, Loch Oich, and Loch Lochy. The weather was phenomenally co-operative, with only one wet morning. Altogether 14 5km squares were visited, and two members, who stayed a little longer, visited a 15th square. A total of 2293 records were made, an average of 168 per square. Most of these were common heath and wet moorland plants with a sprinkling of weeds of disturbed ground, but four elevated areas were visited in five squares and these provided many arctic-alpine species, some of which were also recorded washed down elsewhere. A number of species unusual in v.c. 97 were encountered and of these the following may be mentioned:

Asplenium viride in Glen Buck; *Polystichum lonchitis* on base-rich crags about 700m; *Botrychium lunaria* seen in four distinct and widely separated places; *Ranunculus auricomus* growing with *Epilobium anagallidifolium* in two flushes from some base-rich rocks at about 600m; *Teesdalia nudicaulis* abundant beside some forestry roads; *Subularia aquatica* in the R. Garry; *Elatine hexandra* in a pool of the R. Garry not far from Loch Quoich; *Spergularia rubra* growing in the middle of a weedy lay-by on a forestry road; *Oxalis europaea*, a garden weed at Craigard; *Potentilla crantzii* in a small area of base-rich rock with *Trollius europaeus* and *Silene acaulis*; *P. anglica* in the grass around Craigard Hotel; *Betula nana* in the peat hags of Coire Glas and Sron a' Choire Gairbh; *Oxycoccus palustris* in Coire Glas; *Veronica montana* in two localities, both rocky, grassy areas; *Melampyrum sylvaticum* in a rocky gorge of Glen Buck; *Hammarbya paludosa* beside Loch a Choire Beithe, a colony of many plants, seventeen flowering; *Scirpus fluitans* in the R. Garry; *Carex atrata* on base-rich crags at 700m with *Polystichum lonchitis* nearby; *Festuca altissima* in three places, each a rocky gorge, near a waterfall; *Agropyron caninum* in Glen Buck; *Milium effusum* in a rocky gorge of the R. Garry with *Hymenophyllum wilsonii* and *Galium odoratum*.

Day by day the meet went as follows:

On 10th July one member arrived early and took a walk to Loch Lundie. *Carex lasiocarpa* here set a pattern for the week.

On Sunday 11th July, the party, now ten strong, traversed forestry roads south of Loch Garry.

Monday 12th July was devoted to Gleouraich (1030m (3395 ft)) and Spidean Mialach (992m (3268 ft)). These proved rather barren hills, though *Athyrium alpestre* was abundant, and a single plant of *Leucorchis albida* was seen.

On Tuesday 13th July the last member of the party arrived and the day was spent

by Loch Lochy and in Coire Lochain of Meall na Teanga (930m (3050 ft)). The latter proved a very interesting area.

After two days of hill botanising, Wednesday 14th July was devoted to lower ground beside Loch Oich and in Glen Buck. The greatest variety of the week was found here, as loch-shore, woodland, moor, gorge, and disturbed ground were all explored, yielding 262 records.

Three persons ascended Ben Tee on Thursday 15th July, and saw *Arctous alpinus* and *Arctostaphylos uva-ursi* on the ridge. A fourth joined them in Coire Glas, while the rest explored Kilfinnan with its gorge and waterfall.

The last day, Friday 16th July, was spent motoring to Kinlochhourn, with many stops on the way. There is little but moorland here as Loch Quoich is a reservoir with barren edges, trees are few and there are virtually no houses to provide weeds of cultivation. The pools in the R. Garry proved interesting and at Kinlochhourn the western seaboard provided a very sudden change.

The total number of species encountered during the week was 385, though this number is subject to increase as critical species are determined.

A. A. P. SLACK

GLEN AFFRIC, GLEN CANNICH AND STRATHFARRER, INVERNESS. 17TH-24TH JULY

Five persons gathered at the start of the week at the Glen Affric Hotel, but were joined later in the week by four others, and also by members of the Inverness Botany Group, who came as guests.

The first day was spent in Glen Cannich. We worked in the 5 km square 27/33 SW mainly around Loch Craskie and the banks of the River Cannich. *Lobelia dortmanna* was seen in this loch, and also in the next square, 27/23 SE, at Loch Carrie. *Gentianella campestris* was found on the shores of Loch Carrie. Some of the party climbed by Allt Charaidh to An Soutar, and between these two saw extensive areas of *Betula nana*, growing up to 1620 ft, and thereafter *Arctous alpinus*. We crossed into square 27/23 NE at the summit, where such species as *Salix herbacea*, *Loiseleuria procumbens*, *Arctostaphylos uva-ursi* and *Carex bigelowii* were present.

On the 19th, we returned to Glen Cannich, this time going to Loch Mullardoch, where in square 27/23 SW, *Leontodon taraxacoides* was found. The party split, some remaining on the low ground within the above square, and others climbing Allt Fraoch-Choire towards Coire an T-Sneachda. All of the recording was within square 27/22 NW. The area was not rich, but we did record *Thalictrum alpinum*, *Juncus trifidus*, *Gnaphalium supinum*, *Silene acaulis* and *Luzula spicata*.

The 20th found us in Glen Strathfarrar, working in the lower parts of the Glen. Squares 27/33 NE and 27/33 NW gave us many lowland woodland and riverside species, and we moved upstream to square 27/23 NE, where we climbed An Carnais, finding *Melica nutans* and *Rubus saxatilis*. The flat river plain within this square also gave us *Carex lasiocarpa*, alongside *C. rostrata* and *Menyanthes trifoliata*.

Weather on the 21st forced us to keep to low ground in Glen Affric. We worked along the south side of Loch Beinn a' Mheadoin, through squares 27/22 NE, 27/22 SW and 27/12 SE. The latter square was profitable indeed, producing *Carex limosa*, *C. paupercula*, *Nymphaea alba* and *Vaccinium microcarpum*. The series of small lochans and bogs in this area may well reward further attention.

Better weather conditions next day enabled us to tackle a climb of Sgurr na Lapaich, between Glen Strathfarrar and Loch Mullardoch. The square was 27/13 NE. We climbed the ridge of An Leth-chreag, towards the summit recording *Alchemilla alpina*, *Saxifraga aizoides*, *S. oppositifolia*, *S. stellaris*, *Carex saxatilis*, *Armeria maritima* and many other alpine and woodland species. This is a very fine hill, worth further study. Miss Webster topped the day by finding the rare *Gnaphalium norvegicum*.

The final day, the 23rd, took us to square 27/12 SE once more, to climb the other Sgurr na Lapaich. The weather was atrocious, but a group pressed on by Allt na Faing,

towards the crags, which supported such interesting plants as *Saussurea alpina*, *Trientalis europaea*, *Oxyria digyna* and *Sibbaldia procumbens*, all of which had already been seen elsewhere during the week. Lower down, at Loch Lapaich, Miss Webster had been finding *Subularia aquatica* and *Sparganium minimum*.

On the 24th, after most members had dispersed, a few remained to look around the village of Cannich, which had been sadly neglected all week. Bad weather caused serious attempts at botanising to be quickly abandoned.

The week was a very enjoyable one, with a fine friendly spirit among the participants. We were a group in which each contributed his or her share. None of us was a great expert, and we each learned a lot, especially from the enthusiastic and knowledgeable Miss Webster, who spent three days with us. A feature of the week was the presence of Miss J. T. Wisely, who painted most beautiful representations of the species which we brought down to her. As well as recording for the 5km squares, the opportunity was taken to view the area from the conservation angle, and a report along these lines was prepared for the Nature Conservancy. A copy of this has been presented to the Committee, along with a useful list of sites worthy of future exploration.

A. CURRIE

BEN LEDI, PERTH. 25TH SEPTEMBER

The object of the meeting, which was held jointly with the Andersonian Naturalists of Glasgow, and which was attended by twelve persons, was to investigate the bryophyte flora of the mountain. Species found on the way up to the east Corrie included *Seligeria recurvata*, **S. pusilla*, **Philonotis capillaris*, *Dicranum blyttii*, *Orthothecium intricatum* and *Cololejeunea calcarea*. On the floor of the corrie were *Rubus chamaemorus*, *Chamaepericlymenum suecicum* and *Acrocladium sarmentosum*. On rocks at the head of the corrie were **Pohlia polymorpha* and *Grimmia funalis*. The richest area, one that would repay further study, was to the north of the corrie where were found *Polystichum lonchitis*, *Draba incana*, *Oedipodium griffithianum*, *Amphidium lapponicum*, *Metzgeria pubescens*, **Bryum dixonii*, *Eremonotus myriocarpus* and *Hygrobiella laxifolia*. Species marked with an asterisk are new to v.c. 87.

A. C. CRUNDWELL

IRELAND

URLINGFORD, CO. KILKENNY. 12TH JUNE

The object of the meeting, attended by five members, was to explore the flora of turlough-type lakes known as 'The Loughans' about two miles south-east of Johnstown. The lakelets, fringed with *Filipendula ulmaria* and *Potentilla anserina*, contained much *Ranunculus trichophyllus*, *R. aquatilis* and *Glyceria fluitans*. Other damp areas, possibly under water in winter, yielded *Thalictrum flavum*, *Parnassia palustris*, *Carex hostiana*, *C. lepidocarpa*, *Molinia coerulea* and *Ophioglossum vulgatum* while the calcareous drift banks held *Antennaria dioica*, *Linum catharticum*, *Briza media* and *Orchis morio*. Tullanvoolty Bog, mentioned in older botanical literature, was next visited. Here, two miles north-west of Johnstown, the 'Bog' proved to be a fen somewhat adversely affected by recent drainage. However, species recorded here included *Cirsium dissectum*, *Schoenus nigricans*, *Carex hostiana*, *C. lepidocarpa*, *Selaginella selaginoides* and *Equisetum variegatum*. The meeting ended with the exciting re-discovery of *Ophrys insectifera* recorded from this site in 1837.

C. BREEN

MULLINGAR, CO. WESTMEATH. 23RD-27TH JULY

Twenty-five people attended the meeting centred on Mullingar, County Westmeath. The object of the meeting was to introduce members to the rich flora of the Midland lakes and mires.

Saturday was spent in the Lough Owel area. The fen at Ballynagall, which is known as the 'Scraw Bog', was the first objective and the morning was spent there. Most of the rarities known from there were seen, *Pyrola rotundifolia*, *Carex appropinquata* and *Eriophorum gracile* being of particular interest. *Drosera intermedia*, reported by the Dublin Naturalists' Field Club in 1967, was refound there and is a new county record, as is the rare moss *Camptothecium nitens*.

After lunch the difficult scraw at the north-west corner of Lough Owel was penetrated and *Pyrola rotundifolia*, *Carex appropinquata*, *Thelypteris palustris* and *Lathyrus palustris* refound by the more intrepid adventurers.

Cut-away bog and fen at Welshestown South, two miles south of Lough Owel, produced *Ophrys insectifera*, which had not been recorded for Westmeath. *Selaginella*, *Osmunda*, *Epipactis palustris* and *Carex diandra* were also seen.

Sunday was spent in the region north and north-east of Mullingar. A first call at the southern end of Lough Derravaragh found the lake-level so low that the rhizomes of *Nuphar lutea* were fully exposed to the air; in spite of this, however, *Oenanthe aquatica*, in deep water, barely surfaced. An unusual abundance of *Catabrosa aquatica*, a recently arrived colony of *Epilobium angustifolium* and a few plants of *Ranunculus sceleratus* were seen here.

In a kettle hole just east of Fore a curious type of acid fen has developed with hummocks of *Sphagnum palustre* and *S. rubellum* and the more mesotrophic species. Here was *Carex curta* (discovered here earlier in the year, and now past its prime), not hitherto known from Westmeath; also a remarkable abundance of *Eriophorum vaginatum* and a little *Vaccinium oxycoccus*.

At Fore itself a promising limestone bluff turned out to be so cherty that the plants on top included *Vaccinium myrtillus* and *Carex binervis*, while by the roadside a colony of *Chrysanthemum segetum* also defied the surrounding limestone. The extensive fenny margins of Ben Loughs were next visited: here there is a great abundance of *Cladium* and *Carex diandra*, with *Potamogeton coloratus*, *Carex lepidocarpa*, *Schoenus nigricans* and other calcicoles but also a quantity of *Epilobium angustifolium*. A small colony of *Galium uliginosum* was found on a drier part of the northern shore.

A list was made of the plants growing about a small lakelet to the north-east of White Lough in County Meath but did not include anything unusual. The lakelet itself was surrounded by a band of shell-marl and showed a poor development of aquatics and marginal vegetation; the peaty nature of the soil for some distance above the present water level and the presence of several sub-fossil alder stumps under water was evidence of considerable variation in water level above and below its present level.

On Monday the chief objective was Lough Ree. The shore was visited at two places, south-west of Glassan and opposite Inchmore. *Teucrium scordium* in full flower on the stony shore made a good show at both stations and at the second there was an enormous 'reed-bed' of almost pure *Carex lasiocarpa*. Other interesting plants seen included *Rosa agrestis*, *Thalictrum flavum* and *Equisetum* × *litorale*. *Pinguicula vulgaris* and *Blackstonia perfoliata* were seen scarcely six inches apart on the stony shore. A little further north by Creggan Lough an irregularly cut-away bog yielded a good mixture of calcicole and calcifuge species, with *Potamogeton coloratus* and *P. polygonifolius* mingled in the water. Here the bog-holes yielded three species of *Utricularia*, luxuriant *Myriophyllum verticillatum* and some *M. spicatum*, and also *Sparganium minimum* and a little *Hydrocharis*; while on the surface were *Drosera intermedia* and a profusion of *Osmunda* unusual for Leinster. One plant of *Epipactis palustris* was seen near the roadway. Two visits to the now derelict Royal Canal showed it to be choked with *Glyceria maxima* and *Ranunculus lingua*, with a fringe of *Oenanthe fistulosa* and *O. aquatica*, with floating *Hydrocharis* here and there in open water. A final call at a cut-away bog near the R. Inny on the Longford border showed that drainage had diminished the interest of the place since attention was drawn to it in the *Irish Naturalists' Journal*, 12: 250 (1958) but there is still a profusion of *Rumex*

hydrolapathum and a little *Hydrocharis*, *Ranunculus lingua* and *Stellaria palustris*. The damp pasture beside the bridge was filled with *Senecio* × *ostenfeldii*.

Tuesday morning, the last of the meeting, was spent in the Delvin area. A moraine south of Balrath Cross Roads proved to be too grassy for rare plants. A raised bog east of the Bord na Mona development at Lisclogher appeared to be subjected to controlled burning for grouse but had all the usual bog species. Crowinstown Lake to the east of Delvin has a fenny margin with *Schoenus*, *Carex elata*, *C. hostiana*, *C. diandra*, *Ranunculus lingua* and *Epipactis palustris*, but is becoming acid on the west side with *Sphagnum* spp., *Molinia* and *Erica tetralix*.

D. SYNNOTT & D. A. WEBB

EXHIBITION MEETING, 1971

The Annual Exhibition Meeting was held in the Department of Botany, British Museum (Natural History), London, on Saturday, 27th November, 1971, from 1200 to 1730 hours.

SOME CONFUSED PLANTS

Plants with an overall superficial similarity do not necessarily belong to the same species or even genus and may be easily confused. In our experience this confusion often arises or is amplified because specimens are carelessly keyed and compared with descriptions, or carelessly collected, inadequately labelled and not compared with authentically named material. The following six species-pairs, represented by herbarium specimens, were shown together with short notes drawing attention to particularly useful characters. In each case the two descriptive phrases given refer respectively to the two species they follow.

Cardamine flexuosa and *C. hirsuta*: stamens 6; stamens 4 (but the 2 short stamens in the former may be overlooked).

Medicago lupulina and *Trifolium dubium*: leaflets apiculate; leaflets obcordate and never apiculate.

Potentilla sterilis and *Fragaria vesca*: leaflet teeth acute and 3 terminal teeth forming a truncate apex; leaflet teeth obtuse and terminal ones forming a cuneate apex.

Lamium molucellifolium and *L. amplexicaule*: bracts petiolate and never amplexicaul; bracts sessile and amplexicaul.

Galinsoga parviflora and *G. ciliata*: pappus regular, stems ± glabrous; pappus irregular, stems densely hairy.

Leontodon autumnalis and *Hypochoeris radicata*: hairs on involucre soft, terminal lobe of leaf acute; hairs on involucre stiff, terminal lobe of leaf blunt.

Seven other pairs of species were exhibited at the 1969 Exhibition Meeting (*Watsonia*, 8: 333 (1971)).

E. B. BANGERTER & L. F. FERGUSON

SYNTHESISED *GERANIUM PURPUREUM* × *ROBERTIANUM*

This exhibit comprised specimens and an explanatory note to illustrate hybridisation experiments involving *Geranium purpureum* Vill. and *G. robertianum* L. A further note will be published when the experiments are completed.

P. M. BENOIT

THE B.S.B.I./W.R.O. WEED SURVEY NO. 1

The survey is designed to measure the changes in frequency of 19 common weeds in arable land, and 21 less common ones in any habitat, over a period of time. This

first survey, which is continuing until the end of 1973, will be repeated after a number of years.

So far, records have been received for 128 tetrads and the frequency ratings of the 19 common species in arable land were exhibited as histograms. Of these, *Sinapis arvensis*, *Chenopodium album* and *Atriplex patula* are apparently still widespread and common, although thought to be declining because of their particular sensitivity to herbicides. They were rated as very frequent to abundant in 14–29% of the tetrads so far assessed.

Cardaria draba, thought to be increasing, has so far only been recorded in arable land in one tetrad and rare at that, although noted as a ruderal in several others. Similarly *Anchusa arvensis* has only been recorded from 12% of the tetrads.

R. J. CHANCELLOR

RANUNCULUS BULBOSUS IN EUROPE

The *R. bulbosus* group has previously been divided into several species and subspecific categories. The group has been re-examined and in the proposed classification only two subspecies within the single species *R. bulbosus* L. are recognised: subsp. *bulbosus* and subsp. *adscendens* (Brot.) Neves.

Subsp. *bulbosus* occurs over northern and central Europe; the main habitat in which it occurs is well-drained grassland. Subsp. *adscendens* occurs in southern Europe in areas with a Mediterranean climate, but it only occurs in damp habitats, such as marshes and ditches. It differs from subsp. *bulbosus* in having entire leaves, broad, tuberous roots and root-stocks which are only slightly swollen and corm-like. There is a continuous array of intermediates between the two subspecies, occupying climatically transitional regions.

Examples of both subspecies and of intermediate plants were exhibited. The distribution of the various types of plants which occur in southern Europe was shown on maps.

S. M. COLES

VARIATION IN SPECIES OF VULPIA

The exhibit consisted of herbarium specimens, photographs of chromosome preparations, and a map of Europe indicating the origin of plants of known chromosome number.

Most of the European species of *Vulpia* fall into two main groups: chasmogamous diploids confined to the Mediterranean Region; and partially or wholly cleistogamous species which are diploid or polyploid and occur over a wider part of Europe. *V. geniculata* is the commonest member of the first group. In the second group *V. myuros* and *V. membranacea* are known as diploid, tetraploid and hexaploid races, and there is some indication that the diploids are natives of the Mediterranean zone and the polyploids of more northern areas. In the latter species, diploids are more chasmogamous than polyploids.

Three British species of *Vulpia* are known to hybridise with *Festuca rubra*. A plant of the intergeneric hybrid involving *V. membranacea* from Harlech proved to be pentaploid, with tetraploid (*Vulpia*) and hexaploid (*Festuca*) parents.

R. COTTON & C. A. STACE

THE PHYTOGEOGRAPHY OF MULL

The five-year field programme of the British Museum Mull Survey Project was completed in 1970. Since then a manuscript account of the Flowering Plants and Ferns

has been prepared and work now centres on an investigation of the phytogeographical relationships of the flora. To this end an analysis has been made of the floras of a number of areas in terms of the *Distributional Elements* of J. R. Matthews.

This analysis showed by means of maps and histograms that Mull fits into the general sequence of phytogeographical change in both north-south and west-east directions, with a very strong representation of oceanic and northern elements. Mull has a poor representation of the Arctic-Subarctic, Arctic-Alpine and Alpine elements when compared with the 100 km squares to the east (27 and 37). This is of course due to both the extreme oceanic conditions on Mull and the lack there of the base-rich habitats favoured by many species of these elements. It is hoped that a computerised procedure using the above data will provide a relatively precise picture of the Mull flora in relation to those of comparable areas.

DEPARTMENT OF BOTANY, BRITISH MUSEUM (NATURAL HISTORY)

FOSSIL PLANTS FROM THE SILURIAN AND DEVONIAN OF SOUTH
WALES AND THE WELSH BORDERLAND

The early history of land plants was traced from the Upper Silurian into the Lower Devonian of South Wales and the Welsh Borderland. In the Silurian, very few plants are present. Dichotomously branching, naked axes from lower and upper Ludlovian horizons have not yet yielded tracheids, so that the earliest proven vascular plants are *Cooksonia pertonii* and *C. hemisphaerica*, described by Lang from the Downtonian. Plants with similar organisation, again members of the Rhyniophytina were shown from the younger Downtonian rocks of Breconshire (*Steganotheca*) and Pembroke-shire (*Cooksonia* sp.).

The Breconian flora is much more extensive and varied. Members of the Zosterophyllophytina include *Gosslingia breconensis*, *Sawdonia ornata* and four species of *Zosterophyllum*, while the Rhyniophytina is represented by *Cooksonia* sp. Also included in the assemblage are *Dawsonites arcuatus* (Trimerophytina), *Krithodeophyton croftii* (Barinophytales) and various *Drepanophycus* species, the first lycopods recorded from the region.

D. EDWARDS

SOME UNCOMMON BRITISH SPECIES OCCURRING IN THE
EYJAFJÖRDUR AREA OF NORTHERN ICELAND

On display were a selection of herbarium sheets of, in the main, uncommon British species collected by the exhibitors in northern Iceland during the summer of 1971. These were supplemented by maps and coloured photographs of the area, together with a selection of Icelandic botanical literature and details of the Katla Field Station.

From the floristic viewpoint the Eyjafjörður area is both rich and diverse when compared with other regions of Iceland. The vegetation reaches higher altitudes than in most other regions, and several arctic species that occur there are absent from other parts of the country. At lower altitudes and towards the outermost parts of the local peninsulas many interesting arctic oceanic species are located.

It is considered that the existence of this rich and diverse flora is, in part at least, due to the fact that the district was not covered by a continuous ice-cap, and that elements of the flora survived the major glaciations in such situations as nunataks and ice-free lowland strips on the peninsulas.

J. E. ELSLEY & P. W. LAMBLEY

VARIATION IN *PUCCINELLIA MARITIMA*

Puccinellia maritima is a widespread and often dominant plant in British salt marshes, yet comparatively little is known of its biology, ecology or taxonomy. Work begun recently at the Coastal Ecology Research Station, Norwich, suggests that the species has reacted to the complex mosaic of habitats within the intertidal environment by both plastic responses and the production of genetically fixed ecotypes. Whilst collateral cultivation has eliminated a great deal of variation found in the field, much of this, particularly in characters related to growth-habit and leaf-type, has a genetic basis.

Chromosome counts in the literature include $2n = 14, 49, 56, 63$ and 77 . Counts so far obtained at C.E.R.S. are mostly at the octoploid level ($2n = 56$), occasionally with chromosomes apparently missing (counts of $54, 55$ etc).

A. J. GRAY

HERTFORDSHIRE ALIENS

A collection of about 35 different live specimens was exhibited. The plants were representative of both the bird-seed and wool alien species which had survived in flower until the meeting. They included *Senecio inaequidens*, *Lamarckia aurea*, *Psoralea americana*, *Echinochloa colonum*, *Arachis hypogaea* and *Scorpiurus muricatus*.

Also shown were a selection of the seeds and fruits of some 50 alien plants, together with actual samples of wool waste (grey shoddy), in which large numbers of fruits were visible—this shoddy was the source of about 50% of the specimens on display.

C. G. HANSON

MEADOW SAFFRON AND SAFFRON

In spite of its name the British meadow saffron, *Colchicum autumnale*, is not a source of the spice saffron. The saffron, *Crocus sativus*, is a Mediterranean plant of ancient origin. Some 4320 styles are required for each ounce of saffron, which is therefore very expensive.

F. N. HEPPER

METHODS OF INSECT CAPTURE AND DIGESTION IN BRITISH SPECIES
OF *PINGUICULA*

Species of *Pinguicula*, although superficially the least remarkable of all insectivorous plants, show many striking adaptations for capturing and digesting their prey. Electron microscope studies of a living leaf show what happens when a living insect is trapped on its surface: how the mucilage from the stalked glands anchors it down firmly and the stalked glands start to secrete. A pool of digestive fluid, having marked detergent properties, then accumulates and wets the whole insect surface.

High resolution cytochemical and other methods have located the distribution of certain enzymes (esterase, acid phosphatase, ribonuclease, protease and amylase) in unstimulated and stimulated leaf glands and these enzymes have been shown to have different patterns of distribution.

The time taken for the uptake of the digestive products on the leaf surface has been followed with radioactive tracers and the translocation of the products of digestion, moving through and out of the leaf, has been observed over a 12 hour period.

Y. & J. HESLOP-HARRISON

THE NAMING OF NARCISSI

The only satisfactory and accurate way to treat naturalised Narcissi is as the clones most are. The cultivars appear to persist unaltered; in some cases they have done so for well over a century, and in one for 350 years (see *Roy. Hort. Soc. Daffodil and Tulip Yearbook* 1971, pp. 181–183). The numerous naturalised Narcissi of Guernsey, where vast quantities have been grown, are being treated this way in the forthcoming account of its wild flowers. A sample score or so of naturalised and named Guernsey Narcissi were shown. It has been expertly said that the full tally is likely to be nearer 100 than 50.

D. McCLINTOCK

DOUBLE-FLOWERED CALLUNAS

Mr J. W. Dyce's discovery of a double-flowered *Calluna* in Norfolk this year seems to be about the twelfth such definitely recorded plant in the wild anywhere, apart from about three before the present century. Details of the latter and of their numerous synonyms are lost in a maze of uncertainty (see *Jl R. hort. Soc.*, 91: 438–442 (1966)). Our present clone 'Flore Pleno' is probably one of them.

In addition to pressing material, Mr Dyce sent his heather for propagation. This will allow study of its inherent characteristics and whether it will sport or revert. *Ruth Sparkes*, a yellow-foliaged cultivar, is a sport from the green-foliaged *Alba Plena*, which has produced an apparently identical double-flowered seedling and which is itself a sport from the single-flowered *Alba Elegans*. Most, but not all, plants of *Ruth Sparkes* have branches reverting to *Alba Plena*. In addition, *Ruth Sparkes* has sported to produce the pink-flowered *Joan Sparkes*. Such apparently unstable groups would seem to offer interesting possibilities for genetic investigation.

D. McCLINTOCK

GUERNSEY 1971

The last of the three annual field meetings in Guernsey made fewer important discoveries than its predecessors, which suggests it may now not be too premature to attempt to complete an account of the island's flowers. A few useful observations were made at other times, but the great bulk of worth-while records came from the visit of the B.S.B.I. and the Wild Flower Society in July (see p. 184), and the most exciting from the visit of the British Pteridological Society in April (see p. 204). In all, something like 120–150 records of some importance were made during the year, plus many hundreds of others which were new to one or other of the 79 island squares.

During the year 11 taxa new to Guernsey were discovered in the island, seven species were rediscovered which had not been seen for between 25 and 75 years, ten other species were found which had been recently lost or hardly seen at all, and 16 species rare in Guernsey were found in quite new areas.

D. McCLINTOCK

CONYZA IN BRITAIN

Three taxa of the genus *Conyza* originating from the New World are widespread weeds of waste ground, etc., in many parts of the world. *Conyza canadensis* (L.) Cronq. has been recorded in Britain since the early seventeenth century. *Conyza bonariensis* (L.) Cronq., first recorded at the beginning of this century, is an infrequent alien. *Conyza floribunda* Kunth is now established in Guernsey.

The exhibit consisted of herbarium specimens showing typical and atypical variants

together with an analytical key and a table of contrasting characters as an aid to the identification of these often confused and misidentified species.

In the case of *C. floribunda*, attention was drawn to the fact that the majority of specimens examined at the herbaria of the British Museum and Kew do not entirely conform with the type description but were variants of that species which correspond to forma *subleiotheca* Cuatrecasas of *Conyza bonariensis*.

J. B. MARSHALL & D. McCLINTOCK

BIRD-SEED ALIENS

Many of the alien plants which appear on rubbish tips and waste ground originate from cage or domestic bird-seed. The purpose of this exhibit was to demonstrate the bird-food species, the variety of plants which are introduced into this country with bird seed and the range of countries from which they are imported.

The exhibit included a list of some 30 species of plants which are imported as bird-food together with specimens and seed samples as examples. The following material was exhibited in addition: maps of the world marked to show bird-seed producing regions; samples of crude imported seed; published articles on the bird-seed industry; and specimens of plants introduced with bird-seed.

J. L. MASON & D. McCLINTOCK

TREES ON STAMPS

Only a few species of trees such as coconut palm, banana and rubber have been depicted on stamps in the past. In recent years designers of stamps have become more adventurous, depicting not only the tree but also its flowers and fruits. Today the main countries producing stamps showing trees are tropical and the most popular topic is the timber industry.

Y. L. MOSCATI

SOME SPREADING ALIENS

The problem of mapping unfamiliar alien species that are establishing themselves in our country is one of increasing importance. Three species in point, all from western North America, whose spread is being mapped are *Rubus spectabilis*, *Tolmiea menziesii* and *Tellima grandiflora*. The exhibit attempted to give a summary of what is already known about their distribution and extended an invitation to other botanists to help in the work of mapping them. The maps were based on data in the Biological Records Centre, Monks Wood.

J. O. MOUNTFORD

MISTLETOE SURVEY

The exhibit included a map which showed the tetrads from which Mistletoe has been reported during the last two seasons. Obvious gaps still exist in southern and south-eastern England.

Some smaller maps show the distribution of Mistletoe on its most important hosts in the Hereford area; apple is by far the most widely attacked host in this essentially apple-growing area. It was suggested that the western limit of distribution is not related to the absence of orchards; altitude appears to be a most important limiting factor. The maximum altitude at which it was seen is 870 ft.

The majority of hosts are exotic trees, and it seems likely that the species was much

rarer before man began clearing the forests, typically occurring in open woods on limestone cliffs in the Wye Valley where Mistletoe still occurs today on *Sorbus aria*.

Mistletoe has so far been recorded on thirty hosts within twenty miles of Hereford, the commonest being apple, hawthorn, poplar, lime, false-acacia and field maple.

F. H. PERRING

KENT FIELD CLUB TETRAD MAPPING SCHEME

The object of this scheme is to map the distribution of the vascular plants that occur in Kent on a tetrad basis during the years 1971 to 1975 inclusive. A map of the county marked in tetrads showed that some records had already been received for about half the 1042 tetrads in Kent. From this first year's experience it has been found that there was no magical number by which one could say a tetrad was well worked. At about 200 some of the coastal squares would include all the plants likely to be found there, whilst some of the more inland tetrads had a score of over 400 and even then new plants were still regularly being added.

The exhibit also showed specimens of some of the species recorded for the first time from Kent, such as *Cerastium pumilum*, *Hieracium calcaricola*, *Taraxacum comixtum*, *T. retzii* and *Scirpus holoschoenus*, plus progress distribution maps of *Viburnum lantana*, *V. opulus*, *Agropyron pungens* and *A. repens*.

E. G. PHILP

SOUTH AUSTRALIAN PLANTS RELATED TO BRITISH SPECIES

Dr A. G. Spooner, a B.S.B.I. member who emigrated to South Australia, has kindly sent a large number of herbarium specimens. A selection of those related to British species was exhibited. Some colour photographs showed examples of semi-desert, mallee, coastal dune and riverside vegetation.

H. M. PROCTOR

HYPERICUM × DESETANGSII

Examples of the parents (*H. maculatum* and *H. perforatum*) and both nothomorphs of this hybrid—nm. *desetangsii* (*H. maculatum* subsp. *obtusiusculum* (Tourlet) Hayek × *perforatum*) and nm. *carinthiacum* (Fröhlich) N. Robson (*H. maculatum* subsp. *maculatum* × *perforatum*) were shown. Nm. *desetangsii* (usually tetraploid) is not uncommon in Britain and, owing to its interfertility with both parents, exists as a complete series of intermediates between them; only F₁ or F₂ plants are easily recognisable. Nm. *carinthiacum*, which has not yet been recorded in Britain, is only recognisable in its triploid form; the pentaploid form is similar to *H. perforatum*.

N. K. B. ROBSON

VARIATION IN *CAKILE MARITIMA*

The characters used to differentiate infraspecific groups within this species are leaf and fruit morphology.

Both show considerable variation in the field and in cultivation, leaf-shape being particularly variable. Some reliable patterns of leaf morphology have been obtained by collateral cultivation of plants from different localities in Europe, using leaves from an equivalent position on each plant. Despite the considerable variation present within each population it is possible to deduce that deeply dissected leaves are correlated with regions having little rain in the Spring (the eastern Mediterranean, Spain and the Baltic).

The relationship between *C. maritima* and *C. edentula* in the North Atlantic is to be studied further, but there appear to be no good grounds for separating them as species (other than a chromosome count of $2n = 36$ recorded for *C. edentula* by A. Löve, *C. maritima* having $2n = 18$).

R. SCOTT

A NEW FERN HYBRID FROM THE CHANNEL ISLANDS

During a British Pteridological Society excursion to Guernsey in April, 1971, a new hybrid within the genus *Asplenium* was discovered (*A. billotii* × *A. adiantum-nigrum*). It has since been described as *Asplenium* × *sarniense* Sleep (*Br. Fern Gaz.*, **10**: 209–211 (1971)).

Several plants of this hybrid were discovered in two different localities on the island where both putative parents were growing in abundance. In view of their generally intermediate morphology and uniformly abortive spores there seems little doubt that these plants represent a cross between *Asplenium billotii* and *A. adiantum-nigrum*.

The new fern is approximately intermediate between the parents, but is easily overlooked as a state of *A. adiantum-nigrum*, which it closely resembles in its triangular frond and conspicuous basal pinnae. The influence of *A. billotii* is seen in the pinnules, which are distinctly, although shortly, stalked, even towards the distal end of the pinna, and are oval in shape, with bluntly rounded tips bearing short, mucronate teeth.

Meiosis has been examined in two plants. As expected, both are tetraploid, with the disturbed meiosis indicative of hybridity. The chromosome pairing is of the order of n bivalents and $2n$ univalents, which is completely in accordance with the postulated parentage.

A. SLEEP

THE STATUS OF SOME INTERMEDIATES BETWEEN *CENTAURIUM LITTORALE* AND *CENTAURIUM ERYTHRAEA* FROM THE LANCASHIRE COAST

Mixed populations of *Centaurium littorale* (D. Turner) Gilmour and *Centaurium erythraea* Rafn have been recorded from a number of places on the Lancashire coast. Intermediate plants have previously been reported from Freshfield, Ansdell and Hightown.

Morphological analysis of similar populations found at Freshfield, Ainsdale, Hightown and Lytham St Annes in 1970 and 1971 indicates that some plants are referable to *Centaurium littorale*, others to *Centaurium erythraea* and the remainder appear to be intermediate.

Meiotic chromosome counts of British and European populations of *Centaurium erythraea* and of European populations of *Centaurium littorale* agree with those done by Zeltner (Neuchâtel). Both species have $2n = 40$ and both have regular meiosis and a high percentage of fertile pollen grains.

Counts of the intermediate plants from Freshfield, Ainsdale, Hightown and Lytham St Annes gave $2n = 50, 51, 52, 54, 56, 57, 58, 59$ and 60 , with clear but often unequal division at anaphase I, such as 27–27 and 26–25. All have a slight reduction in the percentage of fertile pollen grains.

These chromosome counts, together with the intermediate morphology, indicate that hybridisation has taken place between *Centaurium littorale* and *Centaurium erythraea*.

R. UBSDELL

PANELS OF PHOTOGRAPHS OF *CALTHA PALUSTRIS* AND
TUSSILAGO FARFARA

The panels are an excerpt from an attempted photographic record of the wild plants of a hill sheep-farm in the upper reaches of Tima Water, Selkirkshire (v.c. 79), the altitude being 900–1500 ft. This and neighbouring farms are about to be planted by commercial forestry, which will inevitably upset the present pattern. It is hoped that such a record may be of interest later, after the new pattern has been established.

A. WALKER

A STATISTICAL ANALYSIS OF THE DISTRIBUTION OF THE BRITISH
MICROSPECIES OF THE GENUS *HIERACIUM*

The exhibit presented a vice-comital analysis of the microspecies of *Hieracium*, using distributional data from the *Critical Supplement to the Atlas of the British Flora*, and choropleth mapping techniques. The data were obtained using an overlay of the Watsonian vice-counties on the *Atlas* grid squares. Two hundred and forty-six species were recorded for the 112 vice-counties of Britain and the 40 vice-counties of Ireland.

The sections of the genus *Hieracium* were represented as choropleth maps showing the numbers of species for each section per vice-county. In addition, the presence-absence species × vice-county matrix was subjected to association analysis and principal components analysis. These techniques produced a major division into montane and lowland vice-county groups, which indicated main centres of distribution in the Scottish Highlands and south-eastern England, with subsidiary centres in montane Ireland and Wales and the Pennines.

The analysis substantially supported Zahn's hypothesis of two separate migration pathways with subsequent microspeciation—one from Scandinavia into the Scottish Highlands, prior to the other into lowland southern England.

D. L. WIGSTON & D. ASTLEY

The following also exhibited:

- E. J. CLEMENT & T. B. RYVES, B.S.B.I. alien hunt, September 1971 (see p. 188).
- COMMITTEE FOR THE STUDY OF THE SCOTTISH FLORA. Inverness-shire survey.
- B. EVERARD. Botanical paintings.
- J. FAULKNER & A. C. JERMY. The status and distribution of *Carex recta* in Britain.
- A. N. GIBBY. Botanical postage stamps.
- S. E. GREENWOOD. Some slides taken at the Manchester Conference.
- A. C. JERMY & P. BROWNSEA. New and interesting fern records from Crete.
- A. MELDERIS. An unusual habitat for *Molinia*.

In the Lecture Hall the following members gave short talks illustrated by colour-slides:

- H. J. B. BIRKS. Plants of the Yukon.
- C. G. HANSON. Aliens in Hertfordshire.
- J. L. MASON. Bird-seed aliens.
- A. G. SIDE. Flowers of Kent.
- F. M. TAYLER. Mediterranean flowers in Britain.
- G. TUCK. Field meetings 1971—Breckland and Alien Hunt.