

EXHIBITION MEETING, 1957

An Exhibition Meeting was held in the Lecture Hall of the British Museum (Natural History), South Kensington, London, S.W.7, by kind permission of the Trustees, on Saturday, November 30, 1957, from 2.30 to 5.30 p.m. 360 members and guests attended, and exhibits were arranged by 44 individuals and institutions. An account of these, based on notes supplied by exhibitors, is given below. For further details see *Nature*, **181**, 605-606.

THE PROBLEM OF *SALICORNIA STRICTA*.—P. W. BALL.

GENERIC DELIMITATION IN *PAPILIONACEAE*.—P. W. BALL.

REPRODUCTION AND CYTOLOGY OF *ALLIUM PARADOXUM*

Photographs of *Allium paradoxum* (Bieb.) G. Don were shown to illustrate the appearance of this Caucasian species. Reproduction is almost entirely by bulbils, which are produced in large quantities in the very dense populations, and bulblets produced on the bulbs. Although seed has been found in small quantities no seedlings have been seen, and it is likely that low seed production is due to bulbil competition for available nutrients. It is possible that as the plants rarely produce more than one flower, as compared with several flowers in its native area, that the species has become more apomictic as it has migrated westward in Europe. Various inflorescence abnormalities were illustrated and floral abnormalities mentioned.

The chromosome number is $2n=16$ and a study of PMC meiosis has shown widespread occurrence of bridge formation at both divisions. This is probably due to the plants' being heterozygous for a chromosome inversion. Ten microphotographs of various stages of division illustrated separation of eight bivalents, bridges and fragments, and pollen-grain division with eight chromosomes. Fragments are found in shed pollen. A table listed the numbers of various abnormalities recorded at PMC meiosis and indicated about 3% empty pollen grains, so that there is no great effect on pollen fertility.—D. M. BARLING.

A NEW HYBRID GRASS

Specimens were exhibited of *Festuca rubra* L. and *Vulpia myuros* (L.) C. C. Gmel. and of a hybrid between them, discovered at Arthog, Merioneth (v.c. 48), on the 15th July 1957.

Also exhibited for comparison was a specimen of the now well-known hybrid *Festuca rubra* × *Vulpia membranacea*, from the Harlech dunes, Merioneth, a new station, and apparently the first in Wales, discovered on the 16th July 1957.

Both hybrids exist as single plants only; fortunately they are perennials. A more detailed account of them is being prepared.—P. M. BENOIT.

SYNTHESISED *CARDAMINE FLEXUOSA* × *HIRSUTA*

Cardamine flexuosa With. and *C. hirsuta* L. have been successfully crossed in both directions.

Seedlings of which *C. flexuosa* is the female and *C. hirsuta* the male parent, respectively, are weak, lacking the vigour one might expect. They are more or less intermediate in appearance, have 6 stamens, and are totally sterile; the anthers are indehiscent and contain imperfect pollen only, and no fruits have been produced, though back-crossing does induce a slight development of the ovary. Specimens of this cross and of the parent species were exhibited.

Seedlings of the reverse cross have not yet flowered.

No chromosome count of these hybrids has been made, but it is reasonable to assume from the published cytology of the parent species that they are triploids with $2n=24$.—P. M. BENOIT.

MYOSOTIS CAESPITOSA × *SCORPIOIDES**

Specimens and sketches of this hybrid from Merioneth, v.c. 48, together with the parent species were exhibited.—P. M. BENOIT.

SENECIO AQUATICUS × *JACOBAEA*

This exhibit comprised specimens of *Senecio aquaticus* Hill, *S. jacobaea* L. and their hybrid, and sketches illustrating some of their distinguishing characters.

Hybrids are often to be found where these two species grow together. They are partially fertile, sometimes occur in quantity, and are very variable; but usually they can be distinguished by their intermediacy and lower fertility.—P. M. BENOIT.

VARIATION IN *LEMNA GIBBA*

Lemna gibba L. is a widely distributed plant which is easily overlooked because of its small size and resemblance to *L. minor* L. Normally it exists in two forms, a summer form with fronds markedly swollen beneath, and a winter form which is flat. The latter is only distinguishable from *L. minor* by its larger size and by a pattern of interrupted lines which are visible near the narrow end of each frond.

L. gibba prefers water rich in mineral salts, and when it is starved it produces an abundant crop of small fronds very difficult to distinguish from *L. minor*. In general the small, starved fronds produce normal buds when nutrients are supplied, but in some cases the dwarfing effect of starvation is permanent. The new form produced is technically a somatic mutation, and mutant lines produced by starving parts of a

*See also **Plant Notes**.—Ed.

clone of *L. gibba* of the elements calcium, magnesium and iron were shown. The calcium-starved mutant, at least, has both summer and winter forms like the typical plant.—H. J. M. BOWEN.

TWO AMERICAN SPECIES OF *LEMNA*

Many of the American plants found in Britain and Ireland are aquatics, and some of them are known to have been introduced in historical times (e.g., *Azolla filiculoides* Lam., *Elodea canadensis* Michx. and *E. callitrichoides* (Rich.) Casp.). There are several American species of *Lemna* which may soon appear in Britain, and as they are not commonly seen *L. perpusilla* Torr. and *L. valdiviana* Phil. were exhibited. Also shown was a plant from an aquarium tank at the Medical Research Council's Laboratories at Harwell, which has not yet been determined but which resembles *L. perpusilla*. This plant has been noticed in other aquarium tanks in Britain, and may soon escape, if it has not already done so.

L. valdiviana resembles *L. minor*, but the sides of the fronds are more nearly parallel and the fronds themselves are asymmetrical and more or less falcate.

L. perpusilla is generally smaller than *L. minor*, but somewhat asymmetric and has three marked longitudinal veins.—H. J. M. BOWEN.

A NEW IMBEDDING TECHNIQUE FOR ORCHID FLOWERS.—D. E. BRADLEY.

THE UNIQUENESS OF THE TEESDALE FLORA

The exhibit was intended to draw the attention of botanists to the richness of the flora of Teesdale, at a time when it is threatened by a proposal to build a reservoir in Upper Teesdale.

Within the area some seventy vascular plants are of particular limited or otherwise significant phytogeographical distribution in Europe and the Northern Hemisphere. An analysis of much of this flora into Matthews's phytogeographical elements was shown and the range of most of the groups was illustrated by maps of the following species:—

Arctic Subarctic Element—*Alchemilla wichuræ* (Buser) Stefanss.

Alpine Element—*Gentiana verna* L.

Arctic-Alpine Element—*Alchemilla glomerulans* Buser, *Dryas octopetala* L., *Minuartia stricta* (Sw.) Hiern.

Northern-Montane Element—*Alchemilla monticola* Opiz, *Potentilla fruticosa* L., *Viola rupestris* Schmidt.

Continental Northern Element—*Carex ericetorum* Poll.

Continental Southern Element—*Helianthemum canum* (L.) Baumg.

Thus Teesdale is common ground for arctic, alpine and south European plants. A few species are of very restricted range, others have a disjunct distribution which may contain other floristically rich areas.

More information on the flora of Teesdale is given by Dr. C. D. Pigott (*J. Ecol.*, **44**, 545 (1956)). The extreme rarity of many of these plants is due, in part, to extravagant collecting by botanists; as is the case with most rare plants, ample material exists in herbaria, and it is hoped that visitors to Teesdale will refrain from collecting specimens.—

M. E. BRADSHAW.

SOME INTERESTING PLANTS FROM THE EUROPEAN HERBARIUM

This exhibit was prepared to enable examples of interesting and newly described plants to be seen. The following herbarium specimens were shown:—*Potamogeton* × *cadburyae* Dandy & Taylor (*P. crispus* × *lucens*)*, together with parent species, *P.* × *pseudofriesii* Dandy & Taylor (*P. acutifolius* × *friesii*)*, together with parent species, *Cirsium eriophorum* × *vulgare*, with parent species, *Scutellaria altissima* L.*, *S. columnae* All.* and "*Agropyron campestre*" Gren. & Godr.*.—

BRITISH MUSEUM (NATURAL HISTORY).

SOME EARLY EUROPEAN FLORAS—BRITISH MUSEUM (NATURAL HISTORY).

FRESH FLOWERS AND FRUITS FROM THE RIVIERA

About one hundred species of plants gathered in, or within, a mile of Menton (Alpes Maritimes) on November 28 were shown.

Flowering specimens of weeds of cultivation included *Arisarum vulgare* Targ.-Tozz., *Hyoseris radiata* L. and *Theligonum cynocrambe* L., and of those also occurring in the British Isles, *Anagallis arvensis* L., *Polycarpon tetraphyllum* (L.) L., *Veronica persica* Poir. and *V. polita* Fr.

Among the trees and shrubs were:—*Arbutus unedo* L., *Cistus albidus* L., *Thelycrania sanguinea* (L.) Fourn., *Rhamnus alaternus* L., *Rosa sempervirens* L., *Rosmarinus officinalis* L., *Smilax aspera* L., a leafy branch of the deciduous *Ostrya carpinifolia* Scop. (which replaces *Carpinus betulus* L.), *Asparagus acutifolius* L., *Juniperus oxycedrus* L. and *Ligustrum vulgare* L.

Species of interest shown in flower were *Asteriscus spinosus* (L.) Schultz Bip., *Bellis sylvestris* Cyrillo, *Moricandia arvensis* (L.) DC. and from across the Italian frontier *Ononis minutissima* L., *Origanum vulgare* L. and *Stachys recta* L.—Miss M. S. CAMPBELL.

M. A. LAWSON, A NEGLECTED BOTANIST—Mrs. H. N. CLOKIE.

SOME NORTH WALES PLANTS

Herbarium specimens were exhibited of plants collected from the Llyn peninsula, Caernarvon.—Miss A. P. CONOLLY.

WORLD DISTRIBUTION OF *CAREX HUMILIS*

Carex humilis Leyss. has its British headquarters in S. Wilts., and in N. Somerset occurs only on the coast. It is abundant in central

*See also **Plant Notes**.—Ed.

Europe but only reaches the Atlantic and Mediterranean coasts at a few points. World distribution maps of the species *sensu stricto* and *sensu lato* were shown. Both the aggregate and segregate species have very disjunct distributions in Asia.—D. E. COOMBE.

THE FLORA OF STAFFORD: DISTRIBUTION MAPS

This exhibit illustrated the method now being used for recording the plants of Staffordshire. The recording unit or unit square is a block of four one kilometre squares with the point of reference at the centre. The present day administrative county of Stafford (including the Dudley enclave) contains 775 unit squares and it is hoped to list a minimum of 200 species for each, except in built up areas. It is expected that this will take another seven years to achieve. At present we have an average of 100 records for each of the 775 unit squares. Distribution maps were shown of the following eight species to illustrate their present day distribution in Staffordshire as far as is known:—*Agrimonia eupatoria* L., *Alchemilla vestita* (Buser) Raunk., *Bryonia dioica* Jacq., *Geum rivale* L., *Ranunculus sceleratus* L., *Rumex alpinus* L., *Senecio squalidus* L. and *Viola palustris* L.—E. S. EDEES.

STAFFORDSHIRE RUBI

Specimens of six Staffordshire *Rubi* were exhibited to show the range of variation over a small area.—E. S. EDEES.

GERMAN PLANT ILLUSTRATIONS

The exhibit consisted of two books by J. Weisz, *Blumen der Alpen* and *Blumen der Berge*, with nearly 200 excellent illustrations in colour, and a number of colour postcard illustrations by other artists. Some herbarium specimens collected by the exhibitor from limestone hill country in Germany were also shown. They included some familiar and some rare British plants.—Miss E. J. GIBBONS.

AQUILEGIA PYRENAICA FROM CAENLOCHAN

This beautiful alpine was sown or planted on the rocky ledges at the head of Caenlochan Glen during the latter half of the last century, along with other introductions. Despite a most obvious situation it has apparently remained un-noticed since the 1930's, due probably to being usually barren. This summer five flowering and one barren plant were seen, and the single specimen taken was exhibited.—R. A. GRAHAM and R. M. HARLEY.

MENTHA × PIPERITA VAR. SYLVESTRIS

Mr. K. E. Bull re-discovered this mint recently, at Broadsands, near Brixham, S. Devon, v.c. 3. It had apparently been 'lost' to British botany for about 150 years. Specimens were shown with typical *M. × piperita*, and its two putative parents, *M. aquatica* L. and *M.*

spicata L. em. Huds. Like typical *M. × piperita* it is evidently an F_1 hybrid, and its differences from this are perhaps due to a reversal of the sexes of the putative parents. It is distinguished from typical *M. × piperita* by having broader leaves—which in the upper parts of the stem are often circular or \pm so; in its thicker, more irregularly interrupted racemes; and in the abundant hairs on the calyx tube and pedicels.—R. A. GRAHAM and R. M. HARLEY.

HOW NOT TO COLLECT AN *OROBANCHE*

The exhibit showed specimens taken up attached to the host plant, with field notes as to shape and colour of flowers, and with certain parts preserved in spirit. Also exhibited was a specimen lacking host and any field notes about the plant whatsoever. The latter is typical of much of the material in national and private herbaria, and is of little taxonomic use. The former, however, is indicative of useful material; it is of utmost importance to note colour characters when the plant is fresh, as these are lost with drying; and preservation of flowers in spirit is of great additional value. Complete collection with roots is advisable if the parasite and its host are in adequate abundance to permit it, and provided that the latter is easily removed.—R. A. GRAHAM and R. M. HARLEY.

SPIRANTHES ROMANZOFFIANA IN DEVON*

A specimen in spirit was exhibited by kind permission of the Director, Royal Botanic Gardens, Kew. The species not previously recorded in England, was collected from boggy ground on Dartmoor, S. Devon, v.c. 3, in July 1957. It is not known to occur on the Continent. Also exhibited was a painting by E. J. Bedford of a specimen from County Cork, kindly loaned by the Keeper of Botany, British Museum (Natural History).—P. C. HALL and Mrs. B. WELCH.

THE NORTHERN SPECIES OF THE *ARENARIA CILIATA* COMPLEX AND SOME INTERSPECIFIC HYBRIDS

Artificial hybrids between *Arenaria norvegica* Gunn. and British and Swedish material of *A. gothica* Fr. were exhibited. Morphologically the British plants resemble *A. norvegica* more closely than the Swedish ones and this conclusion is confirmed by the cytological evidence, *A. norvegica* and British *A. gothica* having a diploid number of 80 while Swedish *A. gothica* has $2n = 100$. The accounts agree with unpublished observations of Dr. K. Blackburn. These hybrids are readily produced but the seed setting on selfing is diminished in the crosses involving the Swedish plants. This may be related to meiotic irregularities in the hybrids. Meiosis appears normal in the hybrids between *A. norvegica* and British *A. gothica*. These observations are relevant to the peculiar distribution of *A. gothica* and it seems reasonable to remove the British plant from this taxon, perhaps recognizing it as a distinct species.—G. HALLIDAY.

*See also paper on p. 37.

FLORA EUROPAEA: PROGRESS AND PROBLEMS

One of the keynotes of the Exhibition Meeting was the relationships of the British flora to the European flora. Members of the Editorial Committee of the 'Flora Europaea' staged a number of exhibits illustrating some of the results of comparing the behaviour of certain species and groups in the British Isles and other parts of their European range. Other exhibits were designed to show the same points (see Ball, Coombe, Heywood, Tutin, Walters, Warburg, Webb).

Details were given of the progress made by the Editorial Committee in organising the 'Flora Europaea', including a map showing the distribution of the Committee's advisers in each country or territory of Europe. Some of the problems to be faced were summarised, particularly those in connexion with the diverse literature sources involved in writing the Flora; a number of unusual reprints received at the Secretariat were displayed.

An article dealing with the above points in detail will be submitted by Heywood & Walters for publication in a later number of *Watsonia*.

—V. H. HEYWOOD.

ANTHYLLIS VULNERARIA IN W. AND S.W. EUROPE

A number of groups in the European flora have been the despair of taxonomists for many decades. *Teucrium* Sect. *Polium* is one; *Anthyllis* Sect. *Vulneraria* is another.

There are several reasons why *Anthyllus vulneraria* has achieved such notoriety. For example one may cite the number of different kinds and patterns of variation which occur; the variations in the breeding system (inbreeding versus outbreeding) with their consequent effect on the variation patterns; the fact that raiation has not apparently led to complete genetic isolation resulting frequently in a lack of clear cut differences between races suggesting that there is considerable gene flow between them.

Although ideally one would like to see the whole complex investigated by means of cultural and genetic experiments as well as field, laboratory and herbarium studies as Marsden Jones and Turrill (1933) suggest, the number of constituent variations (from habitat forms to subspecies) is so vast as to put this almost entirely beyond the bounds of practicability.

The force of Marsden Jones & Turrill's criticisms of previous *A. vulneraria* taxonomy must be largely admitted: reference to Ascherson & Graebner's account alone suffices to show the hotch potch of races, colour and indumentum forms, varieties, etc. which have been described and accepted on minimum evidence. But one must not let this obscure the undoubted facts that careful field and herbarium studies show that a number of major races (or subspecies) can be sorted out which are differentiated morphologically, geographically and in some cases ecologically (although ecological differentiation is often not at all clear); they also show that much of the variation appears to be grouped around certain foci on a fairly sound geographical basis. Jalas's *Borealis*

group is an example of this; other similar groups are found in the Iberian Peninsula and N.W. Africa such as the *webbiana-arundana-hispida-mollis* and the *gandogeri-fontqueri-maura* complexes. Other components such as *A. rosea* Wk. from the Balearic Islands may be specifically distinct.

It should be possible to distinguish such major variations from the fluctuations, genetic varieties, heterozygous phenotypes and other lesser variations whose description does such ill service to taxonomy. Many of these seem to refer to the typical subspecies (subsp. *vulneraria*) although this may largely be due to the greater number of studies made in the countries where it occurs. Their exact nature can however be left for later elucidation if so desired. Likewise the comprobation of the ecotypic status of many of the minor variations will not be the concern of the "Flora Europaea".

Considering just the major races, the taxonomic problems to be faced are formidable enough for the following reasons.

- a. Many were originally described from inadequate material and with incomplete descriptions.
- b. This has led to confusion (due largely to lack of information and documentation) between major races and minor variations.
- c. There is a certain amount of parallelism of variation: similar (though not identical) races occur in geographically distinct areas.
- d. Hybridisation occurs between races and some of the hybrid derivatives have not been recognised as such but described as independent taxa.
- e. Some of the recently described 'species' (by, e.g. Rothmaler, Juzepczuk) are based on inadequate material from poorly explored areas.
- f. The revisions published to date have covered only parts of the total area of the group. Where these overlap, the interpretations are often wildly disparate.
- g. The different authors who have tackled the group have held widely differing taxonomic concepts. The major races have been variously regarded as varieties, subspecies or species.
- h. The nomenclatural confusion which has ensued can easily be imagined and has tended to undermine confidence in all *A. vulneraria* taxonomy, whether good or bad.

The accompanying exhibit comprised simply a selection of recent attempts to classify the variation. If it was remembered that this was only a selection, some idea of the problems involved in producing a reasonably satisfactory account for the whole of Europe could be gained.—V. H. HEYWOOD.

CLINES IN *PINUS NIGRA*

The Black Pine has a wide distribution, occurring in most south European countries from one end of the Mediterranean to the other as was shown in an accompanying map. It is strictly speaking sub-Mediterranean and forms climax communities in many parts of its area.

Historically there has been a tendency to recognise two distinct species, the western *P. laricio* Poir. and the eastern *P. nigra* Arn., but detailed study of the group as a whole shows that there is a clinal tendency in most of its characters from E. to W. This was first recognised by Longo (1903) and discussed in greater detail by Schwarz (1936) who regarded the E. and W. groups as forming together six subspecies of one polymorphic species. Further examination has shown, however, that in most of the characters, such as leaf length, there is such a considerable overlap and so many transgressions as to be almost useless for separating off discrete groups. The only character which shows a more or less constant progression is needle thickness (not breadth) which is correlated largely with the thickness of the hypoderm cell wall and the lumen, giving the leaf greater rigidity.

The character trends do in fact exist but they are shorter and more interrupted than the data of Schwarz suggest. The recognition of subspecies is not, therefore, based on ranges of a number of interrupted clines but on other characters which do not show clinal variation, such as habit, cone colour and shape, etc.

The Calabrian Pine, var. *calabrica* is in many respects intermediate between the eastern group and the western group and the Bosnian Pine, var. *dalmatica* in turn is intermediate in many ways between subsp. *nigra* and subsp. *pallasiana*.

The Black Pines were probably widespread with a more or less continuous area in the Tertiary and have been fragmented into the present day races as a result of later geological cataclysms. The resultant races have become more or less differentiated although traces of their previous continuity can be seen in the fragmentary and interrupted clines which persist today.

There seems to be little basis for the separation of the Pines into an eastern and a western species although current opinion is still divided on this point.

During the past 25 years ten papers have been published on Black Pine nomenclature. If *Pinus nigra* Arn. is rejected as a nom. prov. the correct name for the group as a whole is *P. clusiana* Clemente; and if the two groups are kept specifically separate, *P. clusiana* Clemente is the correct name for the western species and *P. romaniae* Dum Cours. for the eastern, both unfamiliar names.—V. H. HEYWOOD.

GENERIC REARRANGEMENTS IN THE *COMPOSITAE*

In the new List of British Vascular Plants there are a number of changes of nomenclature. Some of these have had to be made on purely nomenclatural grounds, while others are the result of taxonomic studies. In the belief that such changes prove more acceptable if the reasons behind them are explained, the exhibit outlined the taxonomic basis of certain rearrangements in the Chrysanthemineae.—V. H. HEYWOOD.

POA BULBOSA IN SURREY

Half a dozen specimens of *Poa bulbosa* var. *vicipara* were found this year (1957) at Frensham Pond, Surrey, v.c. 17. The plant is probably an introduction in this locality. The only other known inland station for this species in Britain is in Oxfordshire, v.c. 23. Herbarium specimens were exhibited.—J. HODGSON.

ARTIFICIAL HYBRIDS IN THE GENUS *ATRIPLEX*

Two hybrids, *A. littoralis* × *patula* and *A. hastata* × *patula* were shown in this exhibit. Both had been produced artificially during experimental work on the British species of this genus.

The hybrids were intermediate in morphological characters, triploid (*A. patula* having $2n=36$ chromosomes and *A. hastata* and *A. littoralis* $2n=18$), and largely sterile. They were quite distinct from the parent plants, and I have not observed anything resembling them in the field.

—B. A. HULME.

ARABIS HIRSUTA AND *A. BROWNII*

Arabis hirsuta (sensu lato) is very variable in size, hairiness, leaf shape and infructescence. Many taxa have been based upon plants or populations having certain combinations of these variable characters. *A. brownii* Jord. (*A. ciliata* auct. angl., non R.Br.) is such a taxon. It is generally described as being smaller than *A. hirsuta*, having the leaf surfaces glabrous but the margins ciliate, the stems hairless; numerous, overlapping stem leaves with bases rounded (not cordate-amplexicaule); pods broader than *A. hirsuta* and with unwinged seeds. It occurs on the W. coast of Ireland, especially on shell-sand dunes. Herbarium specimens, photographs and graphs of measurements were exhibited showing that each of these characters by itself may be possessed by plants ascribed to *A. hirsuta* (sensu stricto) on the basis of other characters. A map was prepared showing the localities of *A. hirsuta* (sensu stricto) on calcareous coastal dunes.

Furthermore, the Irish coastal populations referred to *A. brownii* Jord. are themselves heterogeneous in the presence or absence of hairs on the leaves and stem, in the form of the leaf-base and in the compactness of the inflorescence. Photographs and herbarium specimens were exhibited to demonstrate this, reference also being made to Syme's varieties (*A. hirsuta* var. *glabrata* and *A. ciliata* var. *hispida*) as an attempt to systematize this variation.

It was concluded that *A. brownii* Jord. is a taxon based on a combination of characters which do not show a high degree of correlation and are themselves variable in natural populations. The basis of this variation is not yet known.—B. M. G. JONES.

PLANTS FROM KERRY

Herbarium specimens from Kerry collected by Messrs. B. Miles, O. Gilbert, P. Bevington-Smith and A. W. Westrup were shown. Species native to Kerry included *Arbutus unedo* L., *Drosera anglica* Huds.,

Pinguicula grandiflora Lam., *P. lusitanica* L., *Scirpus cernuus* Vahl, *S. setaceus* L. and *Rhynchospora fusca* (L.) Ait. f.; naturalised species included *Fuchsia magellanica* Lam. and *Juncus tenuis* Willd., and more recent introductions *Polygonum sagittatum* L., *Calystegia dahurica* (Herbert) G. Don, *Acaena anserinifolia* (J. R. & G. Forst.) Druce, *Malva pusilla* Sm. and *Oralis europaea* Jord.

Photographs of typical habitats and members of the party (by P. Thompson and Miss J. Miller) and a log of the Meeting compiled by Miss J. Robinson were also shown. During the afternoon coloured slides of views, members of the party and flowers, taken by P. Thompson, P. Norman, P. Sheasby and Miss L. W. Frost, were projected.—

JUNIOR ACTIVITIES COMMITTEE.

ELECTRON MICROSCOPY—B. E. JUNIPER.

FIELD PHOTOGRAPHS OF SOME BRITISH ORCHIDS

An illuminated display panel of 32 $3\frac{1}{4}$ " square slides of British orchids, all taken in the field, was displayed. The camera used was a $3\frac{1}{4}$ " \times $2\frac{1}{4}$ " plate camera with roll-film adaptor, using Ferrania-color roll-film. The use of blue flash bulbs enabled close-up studies of natural size to be made in the field. The species illustrated were *Epipactis palustris* (L.) Crantz, *E. leptochila* (Godfery) Godfery, and a chlorophyllose example, *E. phyllanthos* G. E. Sm., *E. phyllanthos* var. *degenera* D. P. Young, *E. helleborine* (L.) Crantz, *E. purpurata* Sm., *Spiranthes spiralis* (L.) Chevall., *Goodyera repens* (L.) R.Br., *Neottia nidus-avis* (L.) Rich., *Gymnadenia conopsea* (L.) R.Br., *Platanthera chlorantha* (Custer) Reichb., *Ophrys sphegodes* Mill., *Himantoglossum hircinum* (L.) Spreng., *Orchis purpurea* Huds., *Dactylorhiza maculata* subsp. *ericetorum* (E. F. Linton) Vermeul., *Orchis mascula* (L.) L., *Dactylorhiza purpurella* (T. & T. A. Steph.) Vermeul. and *Aceras anthropophorum* (L.) Ait. f.—D. E. KIMMINS.

A NARROW-LEAVED FORM OF *EPILOBIUM PEDUNCULARE*

Epilobium pedunculare Cunn. is established in the exhibitor's garden at Platt, W. Kent, v.c. 16, and a distinct narrow-leaved form appeared in several spots there during 1957. It was less vigorous with smaller narrow leaves only about 2 mm. broad. Some plants had only shoots of this form, while others were entirely narrow-leaved. At first there were no intermediates, but in the autumn some plants were seen not immediately referable to either the type or the form of this variable species. Dried and living specimens of the form were exhibited, together with the normal type with larger almost orbicular leaves.—D. McCLINTOCK.

SAXIFRAGA HARTII

A pot containing three small rosettes of *Saxifraga hartii* D. A. Webb was shown. These had been dislodged in August 1957 by the exhibitor slipping on a crumbly cliff on the west coast of Arranmore Island, off the W. coast of County Donegal. This was apparently only

the fifth occasion on which this plant had been found. After two days' search of the cliffs and coast of the entire island, there is little doubt it grows only very sparsely and in small quantity. It is possible that it has not been seen growing wild by any other living botanist.—D. McCLINTOCK.

PAPAVER HYBRIDS

A number of herbarium specimens of *Papaver rhoeas* L., *P. dubium* L., *P. lecoqii* Lamotte, *P. argemone* L. and *P. hybridum* L. were shown along with the following synthetic F_1 hybrids—*P. dubium* \times *lecoqii*, *P. lecoqii* \times *dubium* and *P. dubium* \times *rhoeas*.

The former two crosses showed uniformity and characters intermediate between the two parents. A number of *P. dubium* and *P. rhoeas* F_1 plants all derived from the same capsule showed a range of variation in leaf dissection and degree of floral development, some individuals being stunted and showing virus-like symptoms. Photographs of these individuals were also exhibited. Two *P. dubium* \times *rhoeas* hybrids taken from the field showed similar peculiarities.

Prints of leaves made on 'Ammonax' light sensitive paper showed the morphological differences between the species and the nature of the hybrids.—I. H. McNAUGHTON.

HETEROSTYLY IN *NYMPHOIDES PELTATA*

As in *Primula vulgaris* Huds., long-styled ('pin') and short-styled ('thrum') flowers can be found in *Nymphoides peltata* (S. G. Gmel.) Kuntze; these two kinds can easily be distinguished in fresh or dried material. The exhibit showed herbarium material of the two kinds, together with a map (based on records assembled for the Maps Scheme) on which the available data for the occurrence of 'pin' and 'thrum' plants was shown. Of the two main areas where the species occurs in Britain, the Cambridgeshire Fens have so far yielded only 'pin', whilst in the Thames Valley both kinds occur. In spite of the absence of 'thrum' in the Fens, fruits form freely and seed is set.—Miss B. MANN.

A HYBRID *SYMPHYTUM**

Herbarium specimens of a hitherto unknown hybrid between *Symphytum tuberosum* L. and *S. \times uplandicum* Nyman were exhibited by kind permission of the Director, Royal Botanic Gardens, Kew.—E. MILNE-REDHEAD.

PLANT DRAWINGS BY THE LATE MISS G. LISTER

Drawings of British and foreign shrubs and other plants by the late Miss Gulielma Lister were exhibited.—THE PASSMORE EDWARDS MUSEUM.

PROGRESS IN THE DISTRIBUTION MAPS SCHEME

A map showing distribution by squares of records so far received was displayed. Analysis showed that at least 900,000 records had been

*See also **Plant Notes.**—Ed.

received. Only 30 squares in England and Wales had less than 50 species recorded, but there were still 120 Scottish and 260 Irish squares in this class. About 50% of the 3,500 squares in the British Isles had over 250 records, but of these 54% were in England and Wales. In all there were 944 squares with less than 150 records on which it was intended to concentrate next season, the biggest effort was required in Ireland, where over half of these occurred.—F. H. PERRING and S. M. WALTERS.

MAPS OF ASSORTED CARICES

Maps of the distribution of eight rare British sedges were displayed. These were:—*Carex appropinquata* Schumach., *C. atrata* L., *C. atrofusca* Schkuhr, *C. digitata* L., *C. maritima* Gunn., *C. ornithopoda* Willd., *C. rupestris* All. and *C. vaginata* Tausch.—F. H. PERRING and S. M. WALTERS.

DELIMITATION OF *VIOLA TRICOLOR* AND *V. ARVENSIS*

The characters of "typical" *Viola tricolor* and *V. arvensis* and an intermediate experimentally produced hybrid were demonstrated by means of herbarium specimens, diagrams and photographs, as in the following table.

	V. TRICOLOR	HYBRID	V. ARVENSIS
<i>Stipular morphology</i>	± palmate. Mid-lobe small, hardly leaf-like; usually entire.	Intermediate. Mid-lobe ± enlarged (but not so much so as in <i>V. arvensis</i>) and partly dentate.	Pinnate. Mid-lobe enlarged, usually crenate-dentate or crenately lobed.
<i>Floral characters</i>	Upper petals longer than sepals. Petals pale blue to purple, often with cream on lower petal.	Upper petals as long as, or a little longer, than sepals. Upper petals blue, lateral petals cream tinged blue, lower petals cream, occ. tinged with blue.	Upper petals as long as, or shorter than, sepals. Petals pale cream, occ. tinged or blotched with blue or purple.

	Spur longer than sepaline appendages.	Spur \pm as long as appendages.	Spur as long as appendages.
Pollen	Mostly 4-colpate grains, some 5- and 3-colpate.	Mostly 4-colpate with some 5-colpate grains.	Mostly 5-colpate grains, some 4- and 6-colpate.
Stylar morphology	Stylar flap present.	Stylar flap present but reduced.	Stylar flap so reduced as to appear absent.
Chromosome number	$2n = 26$.	$2n = 30$ (lagging univalents at meiosis).	$2n = 34$.

In addition two true-breeding plants were exhibited having combinations of "typical" *V. tricolor* and *V. arvensis* characters. Cytological studies have shown that these plants are not hybrids, and it is because of such plants that much of the confusion still exists in the *V. tricolor* complex.—A. PETTET.

THE TEESDALE RESERVOIR SITE—C. D. PIGOTT.

SYNTHETIC HYBRIDS IN *SPERGULARIA*

The exhibit consisted of herbarium sheets, photographs of meiosis in pollen mother cells, and colour transparencies of the synthesised hybrid *Spergularia rupicola* \times *salina*, together with its parents, and *S. bocconii* (Scheele) Aschers. & Graebn. A photograph of meiosis in *S. bocconii* \times *salina* and colour transparencies of this synthesised hybrid were also shown.

The hybrids were produced as a result of artificial cross-pollination in the summer of 1956. The morphology of both hybrids is more or less intermediate between that of their parents but complete failure of fruit production results in flowering continuing for the whole summer thus producing long straggling inflorescences. Both these species-hybrids are totally sterile, the stamens failing to complete their development and remaining small. Attempts to back-cross with the parental species using the hybrids as female parents have failed to produce any fruit or seed development whatsoever.

In *S. bocconii*, *S. rupicola* and *S. salina* $2n=36$, the tetraploid number for the genus, and pairing at meiosis is with regular formation of bivalents. In the hybrid *S. bocconii* \times *salina* there are nine bivalents and 18 univalents at meiosis. This indicates a relationship between the parents in so far as they have a common ancestral genome. A similar

conclusion can be drawn from the meiosis of *S. rupicola* × *salina* where there are also nine bivalents and 18 univalents.—J. A. RATTER.

HYPERICUM MACULATUM IN BRITAIN AND EUROPE

Hypericum maculatum Crantz (*H. dubium* Leers) comprises two main groups which have been called subsp. *maculatum* and subsp. *obtusiusculum* (Tourlet) Hayek respectively. Subsp. *maculatum* is a plant of the higher regions in the Alps, but in the north of Europe it occurs at lower altitudes. Its range extends from the Pyrenees, the Massif Central and the Alps to the Faeroes, northern Scandinavia and Siberia. In the central Balkans it is replaced by a local variant—subsp. *immaculatum* (Murb.) Fröhlich—in which the dark glands are absent from the petals. Subsp. *obtusiusculum* occurs at lower levels in the Alps than subsp. *maculatum*, and also in the lowlands of N.W. Europe.

Subsp. *maculatum* was thought to be absent from Britain, but it has been found in Arran, Argyllshire, Perthshire and Morayshire. Three English specimens (from Gloucestershire, Sussex and Cambridgeshire respectively) also appear to belong to this subspecies, but they all were found in habitats which suggested that they might be introductions. In other parts of Britain and Ireland, only subsp. *obtusiusculum* has so far been recorded.

Subsp. *maculatum* is diploid ($2n=16$), while subsp. *obtusiusculum* is tetraploid ($2n=32$) like *H. perforatum*. A comparison of their chromosome complements reveals that subsp. *maculatum* has two chromosomes which are noticeably larger than the others, while in subsp. *obtusiusculum* there are four relatively large chromosomes. This suggests that subsp. *obtusiusculum* may be an autotetraploid, a hypothesis which was verified by doubling the chromosome number of seedlings of subsp. *maculatum* by means of treatment with colchicine. The resultant plants were found to resemble subsp. *obtusiusculum*.

The two British subspecies can be separated morphologically (see *Proc. B.S.B.I.*, 2, 237). Scoring for the differentiating floral characters produces an almost complete separation, but the tetraploid plants cannot be separated from *H. perforatum* L. by this method. The average diameter of ten pollen grains does not completely differentiate the diploid plants from the tetraploids; but the overlap in size is small (diploid: $16.5-21\mu$, tetraploid: $20.4-25.7\mu$), and so this is useful for supporting a determination based on morphology alone.

H. perforatum is 97% apomictic (pseudogamous), but the pollen is normal though sometimes highly sterile. Hence the hybrid between the tetraploid subspecies and *H. perforatum* (i.e. *H.* × *desetangsii* Lamotte) will most frequently be *H. maculatum* subsp. *obtusiusculum* ♀ × *perforatum* ♂ ($2n=32$). Backcrosses to either parent appear to be frequent. No hybrids between subsp. *maculatum* and *H. perforatum* have been recorded in Britain, but certain hybrids described from the

Continent may have the parentage. For example *H. × carinthiacum* var. *maculatiforme* Fröhlich will probably prove to be triploid, i.e. *H. maculatum* subsp. *maculatum* ♀ × *perforatum* ♂.—N. K. B. ROBSON.

DRYOPTERIS AEMULA IN S.E. ENGLAND

Herbarium specimens and distribution maps of *Dryopteris aemula* (Ait.) Kuntze were displayed.

This distinctive fern is usually regarded as an extreme "Oceanic" species; in fact, outside Britain and Ireland it is only recorded from N.W. France, Madeira, and the Azores, and in the British Isles its main area of distribution is certainly in Ireland and along the west coast of Great Britain. Nevertheless, it has since 1845 been recognised as occurring, though very rarely, in the Weald of Sussex and Kent, in a few localities, mainly on sandstone rocks.

An intensive survey has, however, been carried out in recent years of very many of the "gills" (steep-sided ravines) and sandstone outcrops so numerous in the High Weald (Hastings Beds outcrop) of East Sussex and Kent; and this survey has revealed that, in fact, *D. aemula* is widespread, frequent, and in many localities very abundant in suitable habitats in this region.

Up to the present date (29.11.57) forty-four modern localities have been found in the High Weald; thirty-five of these are in East Sussex (v.c. 14), five in West Kent (v.c. 16), and four in East Kent (v.c. 15). These records cover as many as seventeen of the 10 km. squares of the National Grid. It appears highly probable that many more localities remain to be discovered, particularly in the Wadhurst, Burwash, Horsted Keynes and Handcross districts.

The occurrence of *D. aemula* in so many localities in the High Weald appears surprising when it is remembered that the next nearest localities for this fern to those in the Weald are on (1) the Greensand of the Dorset-Devon border; (2) the Quantock Hills; and (3) the edge of Exmoor. It strikes one as even more surprising, and hard to explain, when it is appreciated that *D. aemula* is, in addition, as abundant and as vegetatively luxuriant in many of its Wealden localities as it is *anywhere in Britain*, and certainly far commoner than it is, for instance, in North Wales. It can hardly be called a "relict" in some, at least, of its Sussex and Kentish stations.

In order to try and understand this phenomenon one must consider the ecological factors obtaining in its Wealden habitats.

CLIMATE

The rainfall in the High Weald is by no means high, though higher than that of the London area or any part of East Anglia. The average rainfall for the region about Uckfield and Tunbridge Wells is only a little over 30" p.a., reaching 35" about Crowborough. An explanation must be sought rather in terms of microclimate and of substratum.

In the steep-sided sheltered gills which are the Wealden habitat of this species, a local microclimate is developed which produces higher humidities and lower temperatures in summertime than on the exposed plateaux above. It is noteworthy that *D. aemula* is found most often on slopes or rocks facing north or north-east, though in very sheltered places it is also found on slopes facing south and south-west.

SUBSTRATUM. This factor appears also to be of great importance. In the Weald *D. aemula* always occurs on well-drained but acid soils, with pH in the 5.0-5.5 range, on either massive sandrock or on steep, somewhat stony or rocky sandy banks. It is worth noting that in S.E. England massive sandstone rock exposures of any size are confined to the High Weald, but this cannot be the limiting factor since the species occurs luxuriantly on sandy banks without rock. *Hymenophyllum tunbrigense* (L.) Sm., which occurs to-day in at least twelve High Weald localities, is always found on sandrock, so that its limitation of range can be better understood.

ASSOCIATIONS

D. aemula occurs characteristically in the High Weald with a limited number of fairly constant associated species: on sandrock cliffs there is often in addition a very rich bryophyte flora. A list follows of the most "faithful" associates of *D. aemula* in the High Weald.

Blechnum spicant (L.) Roth, *Dryopteris borreii* Newm., *D. filix-mas* (L.) Schott, *D. dilatata* (Hoffm.) A. Gray, *Athyrium filix-femina* (L.) Roth, *Vaccinium myrtillus* L. and *Luzula sylvatica* (Huds.) Gaudin, and the bryophytes *Mnium hornum* Hedw., *Dicranum scoparium* Hedw., *D. majus* Turn. and *Leucobryum glaucum* (Hedw.) Schimp.

The species occurs most often under the shade of oak, though quite often under beech. Holly and yew are often present on the rocks or banks on which it grows, but, though the fern is very shade tolerant, and even shade demanding, it will not grow under a dense canopy of holly or yew. It is not often found under a coppice canopy, probably because the periodic phases of disturbance and high light intensity are harmful to it.

Hymenophyllum tunbrigense nearly always has *D. aemula* for a companion, but *D. aemula* has, of course, a much wider range.

D. aemula ought, from what is so far known of its ecology, to be found in sheltered valleys in the New Forest or on the Greensand of West Sussex or S.W. Surrey; an unconfirmed Surrey record does in fact exist.—F. ROSE.

INTERESTING ELEMENTS IN THE FLORA OF KENT

Examples of various "geographical elements" in the Kentish flora were exhibited, illustrated mainly by foreign herbarium specimens to emphasize the European origin of most of the Kentish flora.

Examples shown were:—

- | | |
|--|---|
| <p>1. Continental element
(species widespread in Europe,
especially central Europe).</p> | <p><i>Dentaria bulbifera</i> L.—S.E. Eng-
land only.
<i>Ophrys fuciflora</i> (Crantz) Moench
—just reaches Britain in E.
Kent, but is the commonest
<i>Ophrys</i> species in central
Europe, i.e. S. Germany.
<i>Hypericum montanum</i> L.,
<i>Hordelymus europaeus</i> (L.) Harz
—species rare in Kent, but
found in calcareous woodlands,
widely in England and on the
Continent.
<i>Polygala austriaca</i> Crantz—Open
places on calcareous soils in
Kent.</p> |
| <p>2. Continental Southern element
(species of southern distribu-
tion in Europe, but found
fairly widely N. of the Alps).</p> | <p><i>Orchis purpurea</i> Huds.—frequent
in Kent.
<i>O. simia</i> Lam.—rare in Kent
(both these almost unknown
elsewhere in Britain).</p> |
| <p>3. Oceanic-Southern element
southern distribution on W.
margin of Europe).</p> | <p><i>Polygala calcarea</i> F. W. Schultz
—frequent in Kent and S. Eng-
land generally.</p> |
| <p>4. Atlantic element</p> | <p><i>Wahlenbergia hederacea</i> (L.)
Reichb.—rare in Kent—com-
moner in W. of England.</p> |
- F. ROSE.

DRAWINGS OF BRITISH PLANTS

This exhibit consisted of a selection of original drawings from parts X and XI of *Drawings of British Plants*, together with a few published plates from parts I and IX, hand-coloured to demonstrate the results to be achieved by simple washes of water colour.—Miss STELLA ROSS-CRAIG.

PLANTAGO STUDIES

Pot plants of the diploid *Plantago media* L. were exhibited. Its known distribution is, at present:—N.W. Spain, S.W. France, Rumania and Karkov (U.S.S.R.). The characteristics of the diploid were given to assist the detection of the plant should it occur in Great Britain.

Seedlings of *P. lanceolata* L., *P. media* L. and *P. major* L. were also shown.—G. R. SAGAR.

DISTRIBUTION OF *CALLITRICHE* IN NORTH-WEST EUROPE

Distribution maps of the eight species of *Callitriche* occurring in Europe were exhibited together with herbarium sheets and living material. The living material included *C. polymorpha* Lönnr. from Hillerød in Denmark and *C. palustris* L. (*C. verna* L.) from the island of Långskär off the south-west coast of Finland. The living material of *C. palustris* was still flowering profusely whereas the species of *Callitriche* native to Britain had ceased to flower by the middle of November.

Both the keeled- and winged-fruited forms of *C. hermaphroditica* L. (*C. autumnalis* L.) were shown. The keeled-fruited form, which is fairly common in canals in England and Wales, has fruits about 1.3×1.3 mm. The winged-fruited form, with fruits up to 2.9×2.9 mm. is more common in Scotland and Ireland although it does occur as far south as Llyn Maeilog in Anglesey.

The distribution maps, which were only based on either fresh or herbarium material, showed that *C. platycarpa* Kütz. was common throughout Britain and is frequent from Belgium and north Germany to south Norway and south Sweden but, like *C. stagnalis* Scop., it does not extend into Finland. Colour transparencies of most of the European species of *Callitriche* were shown by means of a hand-viewer.

—J. P. SAVIDGE.

SENECIO CAMBRENSIS AND ITS ALLIES IN WIRRAL

Seven ray-flowered "groundsels", collected in Wirral and grown in culture at the Ness Botanic Gardens, were exhibited. Fresh material and coloured transparencies of these taxa were shown. The main distinguishing feature of the taxa is the number and length of the ray-florets, the number of which can vary from 7-15, and from 3 mm. to 11.5 mm. in length. Characters associated with the leaves are very variable, and are unreliable for separation of the taxa. Cytological investigations are at present being made and seed from any "odd" ray-flowered groundsel would be gratefully received.—J. P. SAVIDGE.

SOME STRAIGHTFORWARD BRITISH PLANTS AND THEIR CONTINENTAL COMPLEXITIES

Three species, *Ranunculus bulbosus* L., *Helleborus viridis* L. and *Primula elatior* (L.) Hill, each of which shows comparatively little variation in Britain, were exhibited.

Ranunculus bulbosus in south Europe lacks the corm-like stock but has fleshy roots and differs in other small respects from northern European populations. *Helleborus viridis* is represented by a distinct subspecies with larger flowers and leaves somewhat hairy beneath in central and eastern Europe. *Primula elatior* shows considerable subspecific differentiation which, as in *Helleborus viridis*, is accompanied by differences in ecology and phenology.

It is evident that these and many other species show only a small portion of their total genetic variation in any one part of their range; studies extending beyond the British Isles are, therefore, necessary for the proper understanding of the majority of our species.—T. G. TUTIN.

THE *DISTANTES* CARICES IN BRITAIN AND EUROPE

The exhibit showed the British distribution (Maps Scheme data, not yet complete) of the four species of the Section *Distantes* of the genus *Carex*. With each species were given some details of its occurrence in Europe, to show how a knowledge of the main distribution was important in understanding the British patterns.—S. M. WALTERS.

NITELLA TENUISSIMA, A RARE BRITISH CHAROPHYTE

The exhibit consisted of preserved material and mounted oospores of *Nitella tenuissima* Kütz. collected in a recent experimental peat-digging at Wicken Fen, Cambridgeshire, v.c. 29, in July 1957. This species is one of the classic rarities of the Cambridgeshire Fens, but seems to have been unrecorded since 1922, and not collected with ripe oospores in the present century. Its reappearance at Wicken with the creation of a peat-pool habitat gives hope that other apparently extinct Wicken species may similarly reappear if and when the right conditions can be reproduced.—S. M. WALTERS.

SELF-INCOMPATIBILITY AND HYBRIDISATION IN *CALYSTEGIA*

This exhibit was in two parts, one concerned with the technique of demonstration of self-incompatibility in *Calystegia*, and the other with the evidence for the occurrence of hybrid populations. The investigations, as yet very preliminary, support in general Baker's suggestions (*Proc. B.S.B.I.*, 2, 241) and could be summarised:—

1. *C. sepium* (L.) R. Br. and *C. sylvestris* (Willd.) Roem. & Schult. are markedly self-incompatible.
2. Small populations are usually single clones and therefore set little or no seed.
3. Seed is set in larger populations or in obviously heterogeneous ones.
4. Intermediates of presumed hybrid origin occur frequently in the vicinity of Cambridge.—S. M. WALTERS and Miss A. MARTIN.

SOME BRITISH SPECIES OF *SORBUS* AND THEIR CONTINENTAL ALLIES.— E. F. WARBURG.

PLANTS FROM MORAY

Herbarium sheets of the following plants from Moray, v.c. 95, were exhibited. *Neottia nidus-avis* (L.) Rich., *Glaucium corniculatum* (L.) Rudolph, *Medicago falcata* L. and *Senecio squalidus* L. A specimen of *Mentha* × *maximiliana* F. W. Schultz (*M. aquatica* × *rotundifolia*) from Jersey was also shown.—Miss M. McCALLUM WEBSTER.

“WHAT DO THEY KNOW OF ENGLAND, WHO ONLY ENGLAND KNOW?”

Two examples were shown of how the proper interpretation of plants of the British Isles depends on a knowledge of their behaviour on the continent.

1. *Saxifraga hirsuta* L. and *S. spathularis* Brot., which hybridise so freely in Ireland that they could be regarded as ecotypes of a variable species, remain almost entirely distinct in Spain.

2. *Erica mackaiana* Bab., sterile in Ireland, is fertile in Spain. This is due to a self-sterility gene, and the reduction of the Irish populations to clones. When pollinated by Spanish plants the Irish plants set seed.—D. A. WEBB.