EXHIBITION MEETING, 1963

An Exhibition Meeting was held in the Department of Botany, British Museum (Natural History), London, S.W.7, on Saturday, November 30, 1963, from 2.0 p.m. to 5.30 p.m.

About 350 members and guests attended and exhibits were arranged by 29 individuals. An account of these exhibits, based on notes supplied by exhibitors, is given below.

AN *ALISMA* HYBRID

Specimens were exhibited of a putative hybrid between *Alisma lanceolatum* and *A. plantago-aquatica* from the Isle of Man. Herbarium material of the two parents was also shown for comparison.—D. E. ALLEN.

VARIATION IN *LIMONIUM*

The exhibit showed some of the variation in the two British salt-marsh species of *Limonium*, *L. vulgare* and *L. humile*. Population samples of *L. vulgare* from different marshes in the same area showed some of the forms that occur at different levels. The population from the higher and older parts of the marshes showed a very dense head of closely arranged spikelets. The lower populations showed a tendency towards the morphological character of *L. humile*, and some specimens appeared to be very close to that species. A few individuals of *L. humile* do grow with the common species in these areas. Between these extremes there was a complete range of forms. It would be easy to attribute these forms to environmental differences as they are each characteristic of a particular area. However, a comparison was made between flowering spikes collected from certain different forms in the wild, and those from the same individuals raised under constant non-saline conditions in the experimental garden. This showed that while the habitat could influence to some extent overall size, the significant morphological character of an individual remained unchanged. It appears that the different forms typical of different levels in the salt marsh may be genetically determined.—L. A. BOORMAN.

SOME UNFAMILIAR SPECIES

Herbarium specimens were shown of a number of rare species, mainly from Scotland.—C. J. CADBURY.

NATIONAL NATURE WEEK: THE B.S.B.I. EXHIBIT

The exhibit which was prepared for the 1963 National Nature Week Exhibition was shown in the modified form in which it will be used in the future as a travelling exhibit. It is hoped that it will be shown at the 1964 International Botanical Congress in Edinburgh, which will be attended by many botanists from all over the world and that it will then be exhibited in museums and libraries throughout the country, thus demonstrating the society's aims and activities to a wide cross section of the potentially interested general public. A photograph of the whole

B.S.B.I. stand at the exhibition was also shown together with photos showing the visit by H.R.H. The Duke of Edinburgh to a demonstration of maps scheme equipment on the stand.—J. F. M. CANNON.

HYBRID WATER CROWFEET

A chart demonstrating the ability to hybridise and the fertility of hybrids within *Ranunculus* subgenus *Batrachium* was shown. It could be seen that diploid *R. hederaceus* L., *R. omiophyllus* Ten. and *R. ololeucos* Lloyd belonged to separate gene-pools, while hexaploid *R. tripartitus* DC., tetraploid *R. baudotii* Godr., *R. hederaceus* and *R. omiophyllus* and diploid *R. hederaceus* belonged to a single gene-pool. To demonstrate gene-flow across a polyploid level, specimens of hexaploid *R. tripartitus* and tetraploid *R. omiophyllus* and their fertile pentaploid hybrid were shown. This hybrid was shown to be the same as the well known "New Forest *R. lutarius*".

The Water Crowfeet contain some species well adapted to an aquatic environment and others to a terrestrial one. When *R. baudotii* (an aquatic species) is crossed with *R. hederaceus* (a terrestrial species) the F_1 hybrid is morphologically intermediate and is a strange looking plant that is not suited to either aquatic or terrestrial conditions. When this hybrid is selfed there is segregation in the F_2 and offspring suited to aquatic and terrestrial environments are produced. These F_2 plants are often very unlike either parent and can be regarded as pre-adapted to an ecological niche not occupied by either parent. Herbarium specimens of *R. baudotii* and *R. hederaceus* with their hybrids was shown.—C. D. K. COOK.

FLORA OF ABANDONED AND CULTIVATED LAVENDER FIELDS

A series of charts and drawings comparing the flora of abandoned and cultivated lavender fields at Sisteron were shown.—H. DONOGHUE and R. E. WARREN.

SIR HANS SLOANE AND HIS CURIOUS FRIENDS

The exhibit included specimens from the Sloane Herbarium in the Department of Botany, British Museum (Natural History), London, the Sherardian and Dillenian herbaria in the Department of Botany, University of Oxford, an example of one of the sets of exsiccatae issued by Petiver, and a few specimens from Sloane's 'Vegetable substances collection'. These indicated the interest taken in native and cultivated plants from many lands. Books were selected to show the advance made in plant classification; the desire to enumerate all known species of plants and to illustrate a wide selection of them. These works by Morison, Ray, Tournefort, Petiver, Plukenet and Dillenius were frequently cited by Linnaeus, and the Sloane, Sherardian and Dillenian herbaria, therefore, contain many Linnean types. Books and specimens also showed the great advance made by Doody, Sherard and especially Dillenius in the study of cryptogamic botany. Perhaps the first set of instructions to collectors, those issued by Petiver, and his other aids such as samples of mounted specimens and digest of Ray's classification were also exhibited.—Miss P. I. EDWARDS.

BOTANICAL PAINTINGS

Paintings of British plants, including *Clematis vitalba*, *Calluna vulgaris*,

Plantago media, *Nepeta hederacea* and *Cirsium eriophorum*, were shown.—Mrs. B. EVERARD.

VARIATION IN *BUXUS*

A large diagram displaying the variations in density, health, height and flowering of *Buxus sempervirens* at various altitudes was exhibited.

The chart was compiled from information gathered on the B.S.B.I. Junior Field Meeting at Sisteron in 1963.—A. J. GASTON, J. W. PATTERSON, N. C. RUSSELL and M. WALL.

SOME BOTANICAL POSTAGE STAMPS

More than forty countries were represented by about 320 postage stamps, the illustrations being mostly of flowering plants, but including some of fungi.—Mrs. A. N. GIBBY.

THE WORK OF THE B.S.B.I. CONSERVATION COMMITTEE

The liaison committee between the B.S.B.I. and the Nature Conservancy meets twice a year, and the exhibit showed by means of a large map of Great Britain the localities which have been considered for one reason or another between 1958 and 1963. Interesting sites threatened by some kind of development were most frequent in the southern part of England. Many other threats have received attention from the Secretary and members of the Committee and certain important aspects such as toxic sprays, dumping of refuse and destruction of ponds are recurring items which could not be shown on the map.—F. N. HEPPER.

PROBLEMS IN *EQUISETUM*

—A. C. JERMY.

POA ALPINA L. IN TEESDALE

Poa alpina was found in Upper Teesdale in 1962. This is a new locality, and only the third known locality of the seminiferous form in Britain. The species is circum-polar, and very variable. Various authors have demonstrated apomixis to occur, and variation in chromosome numbers was illustrated from published data. The chromosome numbers of seminiferous material from Teesdale and from Ingleborough suggest that the two populations are not very closely related.—P. S. LLOYD.

ANTHOXANTHUM ODORATUM L. AND *A. ALPINUM* A. & D. LÖVE

Östergren (1942) found both diploid and tetraploid races in *Anthoxanthum odoratum* sensu lato, with distinguishing features. The arctic and alpine diploid plants were described as specifically distinct (as *A. alpinum*) from the widespread tetraploid plants (=*A. odoratum* sensu stricto) by A. & D. Löve (1948).

The occurrence of intermediate plants in Sweden was noted by Hylander (1953). Rozmus (1958) confirmed the described morphological and cytological differences in Polish material and (1960) reported correlated anatomical characters. The absence of discontinuities in the variable characters of *A. odoratum* sensu lato in Sweden was confirmed by I. Hedberg (1961) in a study of herbarium material. Borrill (unpublished)

also finds it frequently difficult to distinguish these taxa.

The recent discovery of a plant resembling *A. alpinum* in the Cairngorms at 800 metres altitude (B. M. G. Jones, 1963) which in cultivation has developed some morphological features more typical of *A. odoratum* sensu stricto, and which cytological examination has shown to be tetraploid, increases the taxonomic difficulty of treating these taxa as species. It seems more natural to us to consider them as subspecies of *A. odoratum* L. (1753) on the basis of the differences in chromosome number, chromosome morphology (K. Jones, unpublished), geographical distribution and ecological preferences. In our opinion the Cairngorm plant is a glabrous form of *A. odoratum*.

The original description of the plant, as a subspecies of *A. odoratum*, was in the Icelandic language by A. Löve (1945) but it was not accompanied by a Latin diagnosis as is required by the *International Code of Botanical Nomenclature* for the validation of new names published after 1st January 1935. The Latin diagnosis was provided by A. & D. Löve (1948) when the taxon was accorded specific rank. Since *A. odoratum L.* clearly has priority, the correct name for the arctic-alpine plant when treated as a subspecies is thus:

Anthoxanthum odoratum subsp. **alpinum** (A. & D. Löve) *stat. nov.*

The subspecies is widely distributed in the sub-Arctic and in the north temperate zone on mountains. Specimens and authentic records indicate its occurrence in S.-E. Greenland, Iceland, Fennoscandia, arctic U.S.S.R. from the Kola peninsula to the Ural Mountains, the Alps, Turkish Armenia, the mountains of C. Asia from the Tien Shan to the Altai and in the Himalayas, the Carpathians, Spitzbergen, the mountains of N.-E. Siberia and the Aleutian Islands.

CHARACTERS OF VALUE IN DISTINGUISHING THE PROPOSED SUBSPECIES OF ANTHOXANTHUM ODORATUM L.

Subsp. ALPINUM	Subsp. ODORATUM
Plant yellowish-green.	Plant green.
Blades of basal leaves narrow (usually 2-4 mm. broad in wild material), more or less erect, glabrous except for the ciliate auricles, rolled when dry.	Blades of basal leaves broad (usually 4-8 mm. broad in wild material), more or less spreading, sparsely hairy at least on the upper surface, expanded when dry.
Leaves of sterile shoots rolled in bud.	Leaves of sterile shoots folded in bud.
Inflorescence golden-yellow to bronze at maturity.	Inflorescence greenish-yellow to dull brown (or purplish) at maturity.
Pedicels glabrous or with a few minute hairs.	Pedicels hairy.
Glumes glabrous, glossy.	Glumes sparsely hairy, or apparently glabrous (with minute scabridulae), usually ciliate on the keel, matt.
Leaf-sheaths with conspicuous air spaces (visible in T.S.).	Leaf-sheaths without air spaces.
Upper epidermis of leaf blade with several rows of large bulliform cells between the sclerenchyma ridges.	Upper epidermis of leaf blade without bulliform cells (visible in V.S. or in epidermal strip).
Guard cells of mature leaves c.40μ long.	Guard cells of mature leaves c.50μ long.
Sub-arctic, arctic and alpine distribution.	Lowlands and hills in the temperate zone.
Habitat: characteristic of areas of late snow-lie.	Habitat: meadows, grassland, open woodlands, etc.
Diploid; $2n=10$.	Tetraploid; $2n=20$.

REFERENCES

HEDBERG, INGA, 1961, Cytotaxonomic studies in Anthoxanthum odoratum L. s. lat., *Svensk Bot. Tidskr.*, **55**, 118-128.

HYLANDER, N., 1953, *Nordisk kärlväxtflora*, **1**. Stockholm.

JONES, B. M. G., 1963, Anthoxanthum alpinum A. & D. Löve, New to the British Isles, *Nature*, **198**, 610.

LINNAEUS, C., 1753, *Species Plantarum*, **1**. Holmae.

LÖVE, A., 1945, *Islenzkar Jurtir*. Lund.

LÖVE, A. & D., 1948, *Chromosome Numbers of Northern Plant Species*. Reykjavik.

ÖSTERGREN, G., 1942, Chromosome numbers in Anthoxanthum, *Hereditas*, **28**, 242-243.

ROZMUS, M., 1958, Cytological investigations on Anthoxanthum alpinum L. et L. a new species of the flora of Poland. *Acta Biol. Cracov., Ser. Bot.*, **1**, 171-184.

———, 1960, The taxonomical rank of Anthoxanthum alpinum L. et L. in the light of anatomical studies. *Acta Biol. Cracov., Ser. Bot.*, **3**, 81-90.

—B. M. G. JONES and A. MELDERIS.

MAYWEEDS

This exhibit illustrated work in progress at Oxford on the genetics and ecology of mayweeds.

It has been known for some time that both diploid ($2n=18$) and tetraploid ($2n=36$) races of *Tripleurospermum maritimum* (L.) Koch exist. A map of chromosome counts made by the contributor was shown. Plants of subsp. *inodorum* (L.) Hyland. ex Vaarama from 21 sites in south, central, east and north Europe were tetraploid, but plants from all 28 sites in Great Britain, 3 sites in northern France, and one site in northern Poland were diploid. Plants of subsp. *maritimum* from 27 sites in the British Isles, 2 sites in Denmark, Iceland and Arctic Russia were all diploid. Diploid and tetraploid plants of subsp. *inodorum* and their triploid hybrid were exhibited. Plants of subsp. *maritimum* were exhibited to show its wide geographical variation.

A combined map and graph, showing a cline of increasing achene size towards the north in subsp. *inodorum* in Great Britain, and the lower density of the achenes of subsp. *maritimum*, was also exhibited; with data showing how the less dense achenes of subsp. *maritimum* float and survive well in sea-water, but survive badly in soil, while the denser achenes of subsp. *inodorum* sink, and survive less well, in sea-water, but survive very well in soil.—Q. O. N. KAY.

CYTOLOGY AND DISTRIBUTION OF *CALTHA*

A distribution map of chromosome races of *Caltha palustris* was shown at the exhibition. This included some earlier British counts by Panigrahi (1955) and counts made on Continental material. On the Continent, tetraploids and high polyploids are common. In Britain, however, no tetraploid has been found. The $2n=56$ race seems the commonest type among the three subspecies of *Caltha* viz. subspecies *palustris*, subspecies *radicans* and subspecies *minor*.

The exhibit also showed some work done on meiotic behaviour of the $2n=56$ race. Bivalents and quadrivalents were the main chromosomal associations with occasional univalents, trivalents and associations higher than quadrivalents. The number of bivalents was also higher than the

quadrivalents. The meiotic behaviour explains the sexual behaviour of these $2n=56$ forms.

REFERENCES

PANIGRAHI, G., 1955, Caltha in the British flora, in LOUSLEY, J. E. (Editor), *Species Studies in the British Flora*, 107-110.

M. KOOTIN-SANWU.

RECENT DISCOVERIES IN *SPARTINA*

An exhibit illustrating the results of a cytological reinvestigation of the origin of *Spartina* × *townsendii* in Southampton Water.

New chromosome numbers are found in a number of species, namely *Spartina maritima, S. alterniflora, S. glabra* and in their hybrid derivatives. Other species from both European and North American localities have also been examined. Most of these chromosome numbers not only differ from previous counts but are based on 10 and not on 7 which was formerly held to be the basic number throughout the genus. This is of particular significance in the tribe *Chlorideae* where other large genera like *Bouteloua* and *Chloris* have base numbers of 10 and *Spartina* has been outstanding with 7. It was shown that these new chromosome numbers do not deny the hybrid nature of *S.* × *townsendii* or its precise parentage.

The cytological information was linked with other aspects. Changes in *Spartina* species distribution during the present century in Southampton Water have been traced and for the first time a detailed study has been made of the relative distributions of the F_1 hybrid and amphidiploid in a mixed community. These suggest that the two forms in their distribution may each conform to different ecological factors and it may be that the whole community is relatively unstable. The results make it possible to compare the vigour and success of the F_1 hybrid *Spartina* × *townsendii* and its amphidiploid derivative.—C. J. MARCHANT.

VARIANTS OF *CREPIS CAPILLARIS**

Specimens selected from the British Museum herbarium were displayed to show the subspecies variation of *Crepis capillaris* (L.) Wallr. The exhibit showed the great range of variation that exists, and material was divided into three main groups to illustrate 'minor variants'.

J. B. MARSHALL.

AN ALIEN *POLYPOGON*

Herbarium specimens of *Polypogon aegypticum*, a dwarf grass occasionally found as a wool alien, were exhibited.—A. MELDERIS.

HYBRIDISATION IN *ONONIS*

This exhibit stated a problem whose investigation had just started. In the form of a scatter diagram for six characters, it presented the range of variation in samples of three populations of *Ononis* from Cambridgeshire: one pure population of each parent species, and a mixed population

*Notes on British Crepis, No. 2 (see pp. 325), deals more fully with this subject.—ED.

(Orwell) containing hybrids. Three young plants grown from seeds coming from the Orwell population were also shown representing *O. spinosa* ($2n=32$), *O. repens* ($2n=$c. 64) and a hybrid individual ($2n=$c. 48). Finally, two herbarium specimens pointing out the main morphological differences between the parent species were part of the exhibit.—P. MORISSET.

A RARE HYBRID GROUNDSEL

A herbarium specimen was shown of *S.* × *viscidulus* Scheele (*S. sylvaticus* × *viscosus*), from a sandpit at Sevenoaks, West Kent. Though apparently widespread in parts of Europe this hybrid seems to have been seen in England only twice before, in Worcestershire and Surrey.—

R. C. PALMER.

MAPPING THE HYBRIDS

Maps of four hybrids and their parents were displayed. These illustrated several kinds of distributed relationship: *Primula veris* × *vulgaris* occurs throughout the area in which both the parents grow, but this is not the normal situation. More frequently the hybrid is very rare or absent in considerable areas where the range of the parents overlap, e.g. *Geum rivale* × *urbanum* is absent from southern Ireland and much of Wales: though *G. rivale* occurs, it is usually a mountain plant in southern Ireland and probably the habitats of the two parents are rarely contiguous.

Occasionally the range of the hybrid extends beyond that of the parents, e.g. *Saxifraga hirsuta* × *spathularis* is found in Galway and Mayo, whereas *S. hirsuta* is confined to south-west Ireland.

A more complex situation is demonstrated by *Stachys palustris* × *sylvatica*: it fades out both westwards and eastwards, and occurs in the absence of *S. sylvatica* in Orkney and Shetland, where, however, it may be an introduction which escapes from gardens.—F. H. PERRING.

TUBERARIA GUTTATA: A POSTSCRIPT

In my paper on 'The British forms of *Tuberaria guttata* (L.) Fourreau', (1962, *Watsonia*, **5**, 236-260), I included a table of rank correlation coefficients between seven characters scored or ranked in cultivated plants of this species from different localities in the British Isles. It is possible to carry out a principal component analysis of this correlation matrix to obtain weightings for these characters, so that the populations can be set out graphically to illustrate their relationships one with another. Put simply, the analysis sets out to discover a direction of variation showing the greatest possible correlation with the various characters which have been measured (or, in this case, ranked). This is the first factor. Variation correlated with this factor is then eliminated from the analysis, and the process repeated to give a second factor—epitomising the most important variation not accounted for by the first factor. A third and subsequent factors can be extracted similarly. By this means, the most important variation in a heterogeneous mass of data can be extracted, and studied in a few dimensions.

The model is a three-dimensional graph showing the weightings of the six *Tuberaria* populations in relation to the first three factors. Four of the

populations lie close to a straight line nearly parallel with the first factor axis. This is rather closely correlated with leaf-colour, seed-size etc., and seems to represent the main trend of ecotypic adaptation to exposed sites. The second factor is correlated with bract frequency and other characters, and separates the Holyhead and Inishbofin populations from the others—though the two do not fall close together, as they have a considerable separation on the first factor. Variation related to the third factor is not obviously taxonomically meaningful—indeed, with the rather small number of characters studied it may already be largely random.—M. C. F. PROCTOR.

PHOTOGRAPHS OF SOME POLLINATING INSECTS

Now that compact, light-weight electronic flash units are readily available, it has become relatively easy to record many aspects of the behaviour of insects at flowers. These photographs were taken over a period of a few weeks in September and October, 1963. This short period accounts for the lack of variety; *Linosyris* figures prominently because a clump was flowering well at the time, and had attracted a variety of insects of various kinds, while many other plants were over. Most of the photographs were taken in and around my own small suburban garden in Exeter; a few were taken in the Botanic Garden of the University, and a few near Crediton. *Technical data*:

Praktica FX 2 single-lens reflex, with 5 cm. Tessar lens, and extension tubes. Pan F or Panatomic X film, developed in Promicrol or Definol. Meccablitz 110 flashgun; exposure 1/50 sec. at F/22, but flash (duration approx. 1/1000 sec.) providing most of the illumination.—M. C. F. PROCTOR.

LYCOPODIUM SELAGO L. IN E. SUSSEX, V.c. 14

Lycopodium selago was found by me in the autumn of 1963 in a wood on the High Weald of East Sussex. This appears to be the first definite record for Sussex (and indeed for S.-E. England) since 1902, when it was found near Birchgrove on Stumblewood Common (see *Fl. Sussex*), though Mrs. Tristram reported it at Dallington Forest at some unspecified date, possibly as late as the nineteen-twenties.

One large plant only was found, but this bore copious sporangia: a small piece was collected as a voucher and is here exhibited. It grew among the moss *Mnium hornum* on a very steep, terraced bank of a wealden 'gill' or ravine on Ashdown Sandstone. Other species close by included: *Dryopteris aemula, D. dilatata, Vaccinium myrtillus, Blechnum spicant, Calluna vulgaris, Althyrium filix-femina, Solidago virgaurea* and *Hypericum pulchrum*, and the bryophytes *Pellia epiphylla, Diplophyllum albicans, Saccogyna viticulosa, Dicranum majus, D. scoparium, Thuidium tamariscinum*. The tree canopy consisted of *Quercus robur* standards and some *Castanea* coppice.

The association is a markedly "Atlantic" one, different from the usual moorland community in which *L. selago* is usually found in N. Britain.—F. ROSE.

RUBUS ARCTICUS

Herbarium material, colour transparencies and paintings of *Rubus arcticus*, seen at approximately 950 metres altitude in the Dovrefjell,

Central Norway, on the B.S.B.I. Scottish Committee's expedition were shown.—Mrs. B. H. S. RUSSELL.

VARIATION AND REPRODUCTION IN SOME BRITISH POTENTILLAS

In Britain, the distributions of *Potentilla tabernaemontani* and *P. crantzii* are discontinuous, and consist of discrete, isolated populations.

As is typical of apomictic species, such populations are morphologically uniform within themselves, but differ from other populations in small but constant characters.

Whereas the large majority of populations can be attributed without difficulty to either *P. tabernaemontani* or *P. crantzii*, a small number have proved to be taxonomically "difficult". Examples, together with their chromosome numbers and origins, were shown in relation to the whole distribution map. Some explanation was given of the embryological and cytological nature of taxonomically "difficult" plants; these can originate by the occasional fertilisation of an unreduced egg-shell in a cross between the two species.—G. L. SMITH*.

DRAWINGS OF BRITISH PLANTS BY DOROTHY MARTIN (1882-1949)

Miss Dorothy Martin (1882-1949) was for some 30 years Art Mistress at Roedean School. She painted several hundred sheets of portraits of British wild flowers for her own amusement, many in the Lake District, where the school was evacuated during the Second World War.

After her death the collection was presented to the Lindley Library of the Royal Horticultural Society on condition that they could also be exhibited elsewhere from time to time.—W. T. STEARN.

FRUITS OF *POLYGONUM* SECTION PERSICARIA

Typical specimens of the nuts of these species of *Polygonum* were exhibited and their more useful characters were described. A key to the species based on fruit characters, reproduced below, was given.

A KEY TO POLYGONUM SECTION PERSICARIA BASED ON FRUIT CHARACTERS.

1. Nut surface matt ..... *P. hydropiper*
1. Nut surface shiny.
   2. Nuts biconvex or planoconvex (rarely tetragonal), Index 1.25-1.5 (1.6). *P. lapathifolium*
   2. Nuts biconcave or planoconcave (rarely trigonous), Index 1.0-1.2 .....
      3. Nuts very small, c. 2.0 mm. long ..... *P. minus*
      3. Nuts larger than above.
         4. Nuts c. 2.5 mm. long ..... *P. persicaria*
         4. Nuts more than 3 mm. long ..... *P. mite*

When the perianth is present the following may be used :

1. Perianth glandular.
   2. Perianth glands large and black ..... *P. hydropiper*
   2. Perianth glands small and yellow ..... *P. lapathifolium*
1. Perianth eglandular.
   (3 onwards as above).

J. TIMSON.

*Gordon L. Smith died on 8th December 1963 : see obituary notice on p. 417. It is hoped to publish a paper embodying the main work on cytotaxonomy of the British material which Gordon was able to finish. Enquiries about the work can be made to Dr. S. M. Walters, Botany School, Cambridge.

SENECIO RUPESTRIS WALDST. & KIT. AND *SENECIO SQUALIDUS* L.

The taxonomy of plants closely related to the familiar Oxford Ragwort, *Senecio squalidus* L., is extremely confused. So far as I am aware, there has been no recent revision of those Sections of the genus to which belong the annual species like the common Groundsel, *Senecio vulgaris* L., and short-lived perennial species like *S. squalidus*.

De Candolle's treatment (1837) has *S. vulgaris* in the annual Section Obaejaceae, *S. squalidus* (as *S. chrysanthemifolius* Poir.) in the next annual section Obaejacoideae and *S. nebrodensis* L. (including *S. rupestris* Waldst. & Kit.) in a perennial Section Jacobaeae. Most subsequent treatments seem to have followed De Candolle.

Afzelius (1924), in a detailed cytological and embryological study of *Senecio*, recommends the transfer of *S. nebrodensis* to Obaejacoides; he shows that his material has $n=10$ like the other members of this Section, whereas *S. vulgaris* and the other Obaejaceae have $n=20$. He made the triploid hybrid *S. viscosus* × *nebrodensis* and investigated its cytology. Rosser's *S. cambrensis* (Rosser, 1955) is an allopolyploid species arising from a similar triploid hybrid between the two Sections (*S. vulgaris* × *squalidus*).

The species of the two Sections make excellent experimental material, and it is obvious that the taxonomic problems can usefully be tackled by cultivation and crossing experiments. The early genetical work of Trow (1913) showed how capitula can be emasculated by carefully removing the disc florets (which are hermaphrodite) and leaving the female ray florets to be pollinated.

The exhibit showed the plant called *S. rupestris* by central European botanists, grown from seed collected in the south Carpathians (Rumania); the distinction between this plant and British *S. squalidus* (also exhibited) seems impossible to make. Rosser's *S. cambrensis* was also shown.

REFERENCES

AFZELIUS, K., 1924, Embryologische und Zytologische Studien in Senecio und Verwandten Gattungen, *Acta Horti Bergiani*, **8**, 123-219.

DE CANDOLLE, A. P., 1837, *Prodromus Syst. Nat. Reg. Veg.*, **6**, 340-352.

ROSSER, E., 1955, A new British species of Senecio, *Watsonia*, **3**, 228-232.

TROW, A. H., 1913, On the inheritance of certain characters in the common Groundsel, Senecio vulgaris L., *Journ. Gen.*, **2**, 239-276.

S. M. WALTERS.

BRITISH PRIMULAS AND THEIR HYBRIDS

There are three British species in the Section *Primula*. The primrose (*P. vulgaris*) is a widespread plant of woodland, occurring in the open on the western fringe of Britain. The cowslip (*P. veris*) is a grassland plant of basic soils and the oxlip (*P. elatior*) occurs in woods on chalky boulder clay in two limited areas of east-central and eastern Enland.

Hybrids often occur where their habitats adjoin. *P. elatior* and *P. veris* meet rarely, and where they do meet hybrids are very scarce. The F_1 is vigorous and partly fertile, but F_2 or backcross plants are rarely, if ever, found in the wild. *P. veris* and *P. vulgaris* often meet on wood margins and in hedgerows, and usually F_1 hybrids occur in small numbers. This

cross, like the previous one, will only succeed where *P. veris* is the female parent. F_2 and backcross plants are rare.

P. elatior and *P. vulgaris* are largely mutually exclusive, but where they do meet "hybrid swarms" occur, with a bewildering array of forms. Either species can act as female parent in this cross, but it is more successful when *P. vulgaris* is the female. Though introgression between these species is occurring, they remain separate over most of their range.

There are thus three stages in isolation illustrated by these species. The pair with the weakest genetic barriers is *P. elatior* and *P. vulgaris;* next comes the pair *P. veris* and *P. vulgaris*; and finally, isolation between *P. veris* and *P. elatior* is almost complete.

Colour photographs, dissected corollas and calyces of the three species and their F_1 hybrids were exhibited, to demonstrate some of their major characteristics.—S. R. J. WOODELL.

During the exhibition the following members showed slides in the Lecture Hall.

Mrs. M. BRIGGS .... Poisonous plants
Mrs. A. N. GIBBY ..... 1963 Field Meetings
Dr. F. H. PERRING ..... Orkney plants
Dr. S. M. WALTERS ..... Czechoslovakian plants
Dr. D. P. YOUNG ..... Cyprus plants