

THE BOTANICAL SOCIETY  
AND EXCHANGE CLUB  
OF THE BRITISH ISLES.

---

REPORT FOR 1926

(WITH BALANCE-SHEET FOR 1925),

BY THE

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G. C. DRUCE, D.Sc., LL.D., F.R.S.,

HON. FELLOW, BOTANICAL SOCIETY, EDINBURGH.

VICE-PRES. BRITISH ASSOCIATION.

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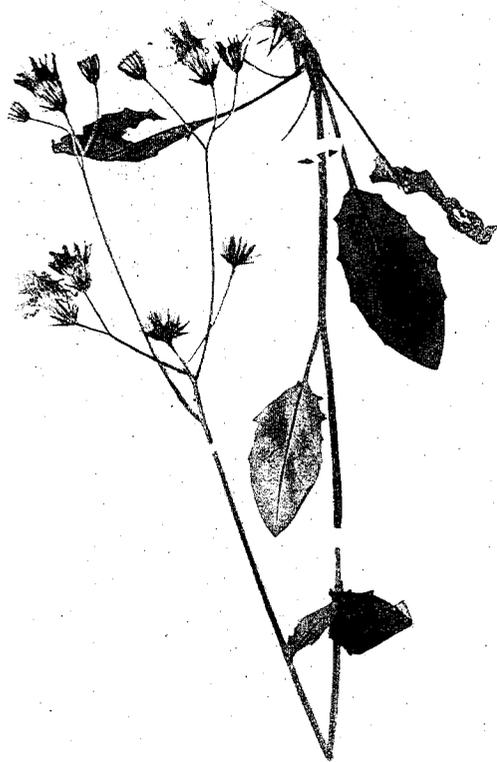
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THE BOTANICAL SOCIETY  
AND EXCHANGE CLUB  
OF THE BRITISH ISLES.

(VOL. VIII. PART I).

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REPORT FOR 1926

BY THE

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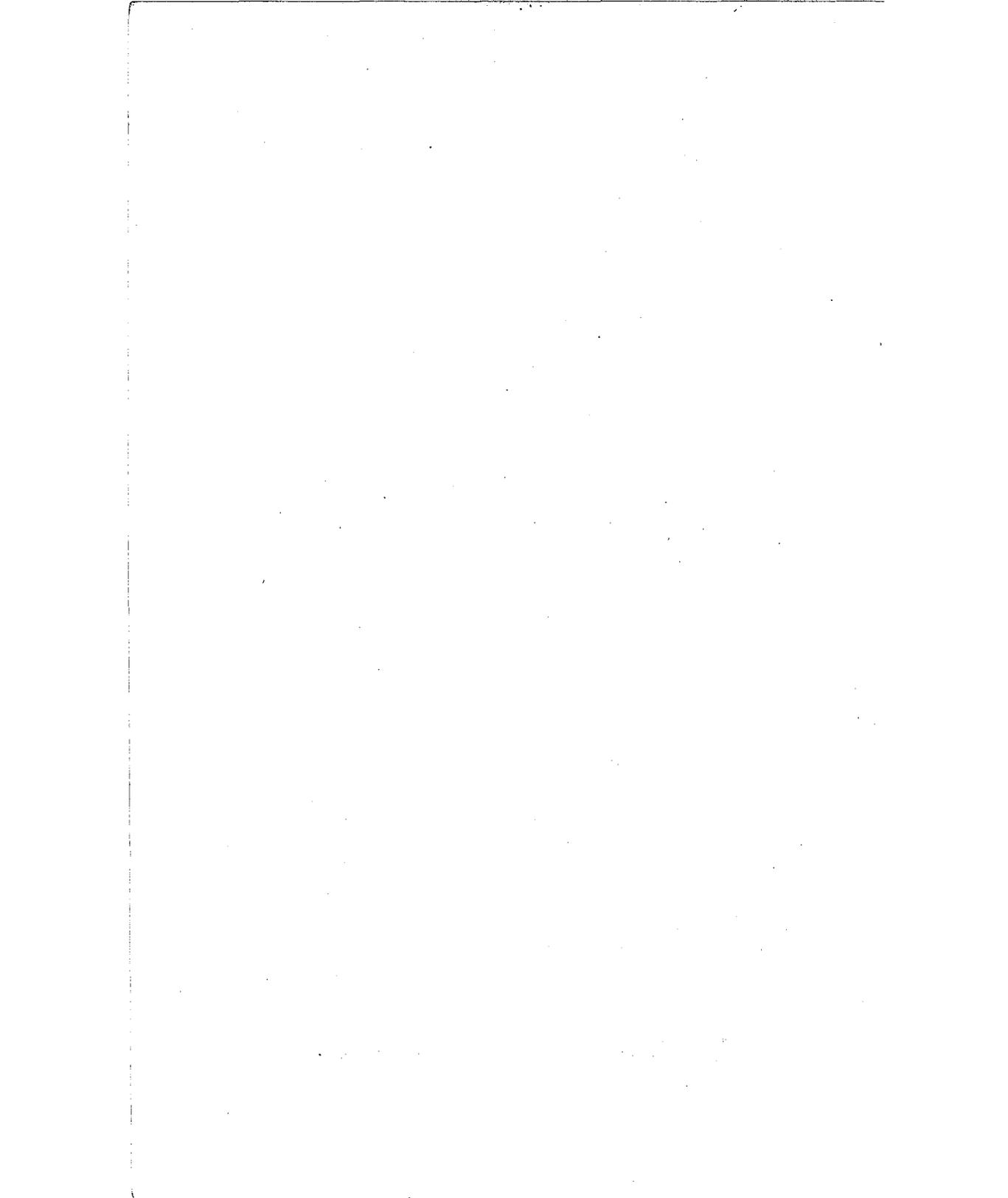
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 Whymper, Lieut. R., F.L.S.  
 Whyte, J. S.  
 Wilkinson, J. G.  
 \*Wilkinson, Mrs Agatha.  
 Willan, Mrs Hugh.  
 Williams & Norgate.  
 †Williams, Miss Ethel.  
 Williams, Miss Lavender.  
 Williams, T. A.  
 †Williamson, R. H.  
 Willmott, Miss E., F.L.S.  
 \*†Wilson, A., F.L.S.  
 Winchester Coll. Nat. Hist. Soc.  
 Wise, W.  
 \*†Wolley-Dod, Lieut.-Col. A. H.  
 †Wood, Hon. Mrs Evelyn.  
 Woodhead, Prof. T. W., Ph.D.  
 Wright, F. R. Elliston (1927).
- †Yapp, Prof. R. Y.  
 †Yeldham, Mrs (1927).  
 Young, F. S., M.A.  
 †Young, Miss Gertrude.



THE  
BOTANICAL SOCIETY & EXCHANGE CLUB  
OF THE BRITISH ISLES.

THE REPORT OF THE SECRETARY & TREASURER,  
G. CLARIDGE DRUCE, YARDLEY LODGE, OXFORD,  
FOR 1926.

*BALANCE-SHEET FOR 1925.*

Subscriptions received, - £241 1 0 Sales of Reports and Ad- vertisement, - - - 17 4 5 Balance from 1924, - - - 30 14 5 <hr style="width: 100%;"/> <p style="text-align: right;">£288 19 10</p>	Printing Reports, &c., - £176 10 0 Expenses of Distribution, - 3 18 9 Postages, Carriages, Station- ery, &c., - - - 28 13 0 Towards List, - - - 50 0 0 Balance. - - - 29 18 1 <hr style="width: 100%;"/> <p style="text-align: right;">£288 19 10</p>
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Balance carried forward, £29 18s 1d. Life Members' Fund, £82 8s.

All subscriptions should be paid to the above address on the first of January each year, or to the account of G. C. Druce in the Westminster Bank, Oxford. Payment in advance for two or more years saves trouble and expense. Ordinary Members, 10/-; Exchange Members, 12/6; Entrance Fee for New Members, 5/-.

Strong pressure has been made to bring out interim reports, but for the present such a plan is impracticable.

Thanks are accorded to Mr H. Downes, M.B., F.L.S., F.G.S., for promptly distributing the parcels to the Exchange Members, containing, as they did, 4457 specimens, and for editing the *Report* in so useful a manner.

We are greatly indebted to Mrs Wedgwood for a generous present to the Benevolent Fund, and also to Mr C. E. Britton and Mr A. H. Evans for donations.

The year 1926 has not been very brilliant in discoveries. Mr C. E. Salmon has described a new species of *Myosotis* as *brevifolia* from the north of England and the south of Scotland and has had a species of *Alchemilla* as *Salmoniana* named after him by Dr Jaquet. It was

gathered in Cumberland. Mr and Mrs Corstorphine gathered *A. coriacea* in Forfarshire, and I have also a new species, *A. colorata*, from Belfast. There are three new *Taraxaca*, all found in Oxfordshire, but not confined to that county since I got *britannicum* near Tenby, *sublutescens* in W. Ross, and *alienum* in several counties. Several other Dandelion species, hitherto unrecorded for Britain, have been found. Dr Dahlstedt has named about 10 from the Orkneys gathered by Colonel H. H. Johnston. He has also named two new species of hawkweeds, one found by me in Sussex and the other in Forfarshire, but their distinctness has been challenged. Dr Drabble has named two new species of *Viola*—*anglica* and *latifolia* and an *Erophila*—*oedocarpa*. Two new species of *Thymus* have been detected by Dr Ronniger among specimens in the National Herbarium. The very rare *Epipogon* again appeared in our Oxfordshire wood and two specimens, both very small, were seen by me. Our energetic workers, Messrs R. Smith and R. Melville, have added many aliens to our List.

The publications on botanical subjects during the year are for the most part reviewed in the subsequent pages of this *Report*, but we must single out for special notice the sixth supplement of the "Index Kewensis," published by the Clarendon Press, and prepared by its Editor with meticulous care; Miss Arber's "Monocotyledons;" Dr Rendle's "Dicotyledons," issued by the Cambridge Press, and Mr Hutchinson's "Families of Flowering Plants," all important additions to the literature on classification. "The Flora of Buckinghamshire" by the Secretary completes the Flora of the Upper Thames province. Its preparation has taken nearly half a century. The year also witnessed the appearance in "The Victoria County History" of my Botany of Huntingdonshire. We are very glad to see that under able editorship *The North Western Naturalist* is making excellent headway. The Wild Flower Society, with Mrs Dent and her energetic helpers, continues to bring in new adherents to Field Botany, and the *Irish Naturalist* is now published bi-monthly in Belfast.

We are greatly indebted to Dr S. H. Vines, Rev. F. Bennett, Mr T. Gambier Parry, Mr R. H. Corstorphine, Mr W. H. Pearsall, Rev. H. J. Riddlesdell, Mr R. Butcher, Mr W. O. Howarth, Col. A. H. Wolley-Dod, Mr J. Fraser, Dr Drabble, Mr D. Lumb, Mr A. Bennett, and Mr A. E. Wade for their literary and critical assistance, and also to the authorities of the Royal Botanic Gardens, Kew; the Botanic Gardens, Edinburgh, and the Natural History Museum at Cromwell Road. Many excellent foreign botanists have rendered help in naming critical species. Dr Albert Thellung, whose splendid book on the Umbelliferae is noticed elsewhere has named the Aliens; Dr C. Lindman, the Poas; Dr E. Almqvist, the Capsellas; Dr H. Dahlstedt, the Dandelions; Dr R. Danser, the Polygonaceae; Dr Karl Ronniger, the Thymes; M. Paul de Riencourt, the Leguminosae, and Dr J. Murr, the Chenopodiaceae. Prof. C. H. Ostenfeld and Prof. J. Holmboe have also given assistance.

We beg to offer sincerest congratulations to our member, Emeritus-Professor W. Somerville on the K.B.E. conferred on him. We are re-

joyed to see he is recovering from his long illness. We notice with pleasure that Lord Lambourne has been presented with his portrait, painted by W. de Glehn, A.R.A., by the members of the Royal Horticultural Society to hang in the great hall of their new building at Westminster; that Prof. F. E. Weiss has been elected a Corresponding Member of the Société Botanique de Genève, and that Dr Dukinfield Scott has been awarded the Darwin Medal of the Royal Society for his contributions to palaeophytology.

A well deserved honour has been bestowed by the conferring of a Knighthood on Prof. J. Bretland Farmer, F.R.S. There is a portrait and an account of him in *The Gardeners' Chronicle*, of which he was once editor. He has been long associated with the Imperial College of Science and Technology at South Kensington. Capt. A. W. Hill, Director of Kew, was made C.M.G. in the King's Birthday honours, and Prof. Francis Oliver was given the Hon. LL.D. by the University of Aberdeen.

The new members include:—Sir W. M. Abbot Anderson, Bart. (1927); Mr J. Y. Ainsworth; Miss E. L. Baumgartner; Prof. F. S. Beatty; Mr C. Bellamy; Mr J. H. Bowman (1927); Mr Horace J. Bradley, J.P.; Mr A. E. Bradshaw; Prof. Major K. W. Braid; Mr F. R. Browning; Mrs Burdon (1927); Dr Campbell; Major-General Cator, C.B., D.S.O.; Mr W. Feaver Clarke, J.P.; Mr A. Cobb; Miss Alice Cole; Mr J. Gordon Dalgleish; Mrs R. Davies (1927); Miss Ethel Edgar; Mr Johnston Edwards, Mrs A. B. Gillett; Mrs M. Hall (1927); Rev. D. M. Heath (1927); Sir A. Hort, Bart.; Mr J. W. Long; Mr J. E. Lousley; The Hon. Mrs Manners; Rev. W. Keble Martin; Mr Ashley Maude, F.L.S.; Mr S. P. Mercer (1927); Lieut. S. K. Mukerji, M.Sc., F.L.S.; The Bot. Dept., University, Oslo; Miss O. B. Owen; Pekin Metropolitan Library; Captain A. H. Batten Pool; Mr Granville Proby; Miss Rusher; Miss H. M. Salmon (1927); Miss N. Smith; Mr H. D. Stanley; Major-General F. C. Stern, O.B.E., M.C.; Mrs M. E. Stewart; Miss C. Stevens; Mr J. Sutherland (1927); Mr Eric Taverner; Mrs Theobald (1927); Mr C. A. Thorold; Mr A. Turner; Colonel G. Watts; Rev. John Webster (1927); Mr F. R. Elliston Wright (1927), and Mrs Yeldham.

We have been deprived of many valued members by death. The botanical world has lost Prof. W. Bateson and Dr Guppy, most able scientists, and in the death of Sir George Holford, horticulture has been deprived of one of its most brilliant devotees, our Society of a most kindly supporter, and myself of one of my kindest friends. It will be remembered that he allowed us to meet at Dorchester House, his palatial mansion, in 1926. Prince Frederic Duleep Singh, who entertained some of us on our Botanical visit to Norfolk in 1925 and showed us *Liparis* on his estate, died all too young, and his county has been robbed of a loyal helper in archaeological and historical investigation. The ranks of English Field workers have been broken by the death of John Cryer, an old Editor and Distributor of the Exchange Club, to whom British Botanists were indebted for his identification of *Hieracia*. On those of Yorkshire he was an acknowledged authority. We have also lost Prof. R. W. Phillips of Bangor, a worker at the Algae, and Dr Drinkwater, a clever de-

lineator of British Plants and an able worker at Genetics. Many of his paintings enliven the National Museum of Wales at Cardiff. The Society has lost in Emeritus-Professor E. Hackel of Attersea one of its most able experts and one who for many years was a tower of strength in assisting to name the Graminaceae, of which he was the acknowledged authority.

The weather was not particularly genial during the year, Scotland excepted, but the magnificent display of blossom on the Pear, Cherry, Plum, and Apple was remarkable. The yield, however, was not proportionate, a cold frosty night causing great damage throughout a large area of England. Scotland was an exception for nearly the whole of July was signalled by almost unbroken sunshine. Little rain fell even on the west coast, so that actually a shortage of water was experienced at Gairloch! This sunshine caused a copious flowering of *Hieracia* but the more delicate plants were soon over and grasses quickly dried up.

My earliest excursion was a motor run with Mrs Wedgwood to Tenby for the purpose of seeing *Limonium transwallianum*. It appears to be a well marked form. The journey down was rendered very pleasant by the extraordinary abundance of Pear and Plum blossom. On the sand dunes between Tenby and Penally two new Dandelions were found, each of them having been previously seen in Oxford, *i.e.*, *britannicum* and *alienum*. Our valued member, Mr Arnott, showed us the Tenby daffodil, both the single and double-flowering plants. *Hutchinsia* was in flower and a distinct looking form of *Viola canina* grew on the dunes. We saw young plants of *Centaureum scilloides* at Newport. Near Swansea on the sand dunes there was a great display of *Taraxaca*. At Kenfig one noticed that the Pool was changing its position, the water being pushed landwards by the encroachment of the sand on the leeward side. Byfleet was next visited with Lady Davy, where *Moenchia* was in good show on April 15th. On the 22nd, with General and Miss Cator, *Muscari* was seen in fine bloom near Ditchley. In May we found plenty of *Taraxacum faroense* in Berkshire, and on the 27th of that month saw two specimens of *Epipogon* in Oxfordshire, also *Euphorbia virgata*, *Bunias orientalis* near Henley, and *Ornithogalum umbellatum* seemingly native at Bix. On June 6th, *Orchis Simia* was in good flower, but the locality has become known to the Reading students who will, it is hoped, preserve it from the great risk of its extinction. On the 13th June some of us met under the genial hospitality of the Earl and Countess Buxton and worked Boxhill where *Ajuga Chamaepitys*, *Aceras* and *Herminium* were seen. In Ashdown Forest we got a Hawkweed which Dr Dahlstedt has named a new species, *H. megapodium*. On the 17th Richmond Park was visited in order to see the narrow-leaved form of *Carex divisa* to which we were directed by Mr Fraser. It is not the true *stenophylla*. Another party met on June 26th at Miss Grenfell's and motored to Lyndhurst where most of the New Forest rarities were seen, including several specimens of *Gladiolus*. July was spent in motoring to Scotland. The atrocious weather prevented any work being done on the way except to gather *Trifolium ochroleucon* at Alconbury in

Hunts. Our second night was spent at Durham, the third in Edinburgh, and the fourth in Arbroath. We gathered *Valeriana pyrenaica* in splendid flower south of Perth. We had a long day and a thorough drenching on the sands of Barry, vainly trying to show Mr Gambier Parry the Coral Root, but accompanied by Mr Corstorphine on a second day we saw a couple of specimens in fruit in a place where normally there are thousands. *Orchis incarnata*, var. *dunensis* Dr. was nearly over blossom. The usual plants were seen at Forfar and Restennet. We had a long day in Corrie Phee where *Carex Grahami* was in good condition. One doubts its being a hybrid. Neither of its putative parents is in the neighbourhood. We then motored over the Cairn o' Mount (1489 feet altitude) to Aboyne. On a glorious day a fine sight was to be seen in an orange-reddish ribbon by the burnside leading to Clatterin' Brig. It was caused by a luxuriant growth of a variety of *Mimulus guttatus*. With it was *Meconopsis cambrica*. The burn is in Kincardineshire. Shortly before reaching Banchory we found plenty of *Listera cordata* and *Goodyera*. That first-class hotel, the Tor-na-Coile, was made our headquarters and from there we diligently searched for nearly a week for *Botrychium matricariifolium*, but in vain. We found *Orchis maculata* × *Habenaria Gymnadenia*, *Orchis praetermissa*, var. *pulchella*, *O. purpurella*, *Teesdalea*, *Polygala dubia*, *Campanula persicifolia* and other aliens. We then motored by Alford, Huntly, Elgin and Forres to the Culbin Sands. Here *Goodyera* and *Pyrola minor* were seen, and *Orchis purpurella* and *praetermissa*, but past their best. There was no sign of *Corallorrhiza*. The Sands are well worth a visit owing to their extent and beauty. Their vegetation has been well described by Mr Stewart and Mr Patton in our 1923 *Report*. We then went on through Inverness, Beaully and Strathpeffer to Strathcarron. The strenuous work for a fortnight in W. Ross will be detailed in the Flora of W. Ross. We got home in time for a busy week at the British Association annual meeting. The Presidential address in the Sheldonian was a brilliant function. The Prince of Wales was clearly heard not only in the Sheldonian but in the Town Hall, and he had doubtless, owing to wireless, the largest audience ever experienced by the President of the B.A. Lord Balfour proposed the vote of thanks in a speech of some length. It brought back the memory of the last meeting when Lord Salisbury (Lord Balfour's uncle) was President, and when Huxley proposed the vote of thanks. One may say that, as Vice-President, I had the honour to preside at the popular lecture by Julian Huxley in the Town Hall the same week. Section K. was well attended under the Presidency of Prof. Bower. A glorious day was granted for the large Botanical excursion over the Berkshire Chalk Downs and Greenham Commons to Pangbourne and Abingdon. A Sunday afternoon was spent in Bagley Wood. The rest of August was spent in the Dauphiny, going from Paris to Grenoble, then motoring to Le Lautaret, the Col du Galibier, St Jean de Maurienne where there is a quantity of *Epipogon*, Chamounix and Geneva. There we met M. Buser, who had kept my *Alchemillas*

## PLANT NOTES, ETC., FOR 1926.

(Mostly New Plants to the British Isles or Notes on British Species  
inserted here for Convenience of Reference.)

ABBREVIATIONS.—† before a name signifies the plant is not native; × = a hybrid; ± more or less; ! after a locality, that the Secretary has seen the plant there; [ ] that the plant is not British or the record is doubtful; *Ann. Bot.* = *Annals of Botany*; *Bot. Abstr.* = *Botanical Abstracts*; *Gard. Chron.* = *Gardeners' Chronicle*; *Ir. Nat.* = *Irish Naturalist*; *Journ. Bot.* or *J. of B.* = *Journal of Botany*; *Nat.* = *The Naturalist*.

9. ANEMONE NEMOROSA L., var. CAERULEA DC. *Gard. Chron.* i., 151, 1926. It occurs in Wales, not in woodlands but in vast numbers on many a breezy, treeless, upland sheep-walk, especially, it would seem, in the slate producing districts. Last year I came across some fields and a railway-cutting which were literally blued by these pretty flowers. On closer examination, however, I noted that here again there was a wide variation in the colour—whites, then pinky lilacs, and both pale and lavender blues. The blue ones flower a good deal later than the rest.

21. RANUNCULUS AURICOMUS L., var. INCISIFOLIUS Reichb. Calow, Derbyshire. Lower leaves very deeply divided, upper leaves with broad, coarsely and irregularly toothed segments. It may be worth mentioning that the reniform lower leaves and narrow segments of the upper leaves of the common form may have a distinct downy coat (Southall, Middlesex; Hasland, Derbyshire.) Hayward's Pocket Book, Ed. 17, 1922, states that the radical leaves are glabrous. E. DRABBLE.

22. R. BULBOSUS L. Finchley, Middlesex, May 1913. Flowers apetalous but long stalked (unlike Mr St John Marriott's plants from Dartford Heath, *Rep. B.E.C.* 431, 1924); fruits fully formed; habit of plant normal. E. DRABBLE.

24. R. FLAMMULA L. It is worthy of notice that this species, like *R. lingua*, may have the leaves glabrous or hairy and this is true for both the entire leaved and serrate leaved (var. *serratus* DC.) forms. The amount of hairiness varies greatly, and different leaves on the same plant may have glabrous or a hairy epidermis. I have plants with quite glabrous leaves from Wingerworth, Derbyshire; Colne, Lancashire; Mitcham Common and Ockham, Surrey; Sychnant Pass, Carnarvon-

shire, and Ullswater, Cumberland. Plants with more or less hairy leaves I have gathered at Calow, Derbyshire; Flitwick, Bedfordshire; Grange Hill, Essex; Wimbledon Common, Surrey; Lizard, Cornwall; Sychnant Pass, Carnarvonshire, and Ullswater, Cumberland. E. DRABBLE.

28. R. SARDOUS Cr. Freshwater, Isle of Wight, 1924. See *Rep. B.E.C.* 431, 1924. The suggestion of hybridity was quite tentative and was not meant for publication. The plant was prostrate without an upright main stem, and covered an area about 20 inches in diameter. The leaves and stems were slightly hairy and the flowers large (4-5ths in.). The carpels, which grew to the normal size, all dried up and withered without forming a single fertile fruit. Tuberculation of the carpels was scanty, but distinct in dried specimens. I have gathered a small prostrate plant at Filey, Yorkshire, but the plant now under consideration is quite different, and unlike anything else that I have seen. Unfortunately all attempts to keep it growing through the winter failed. It may here be mentioned that the hairiness of *sardous* varies greatly. I have plants with stems and petioles almost glabrous whilst others are densely clothed with long and shaggy hairs. Both were gathered in Swanscombe Marshes, Kent. E. DRABBLE.

28. R. SARDOUS Cr., var. TUBERCULATUS Celak. Lewes, Sussex, J. W. WOODS in *South Lond. Bot. Inst. Herb.* C. E. BRITTON in *Journ. Bot.* 324, 1926. Plants in my herbarium from Newhaven, Sussex, 1909; Woking, Surrey, 1909, and from Cardigan, Dr Clarke, show the character. My Chichester plants, like all the adventives, belong to the type which has one row only of tubercles. One may add that the sub-species *trilobus* Desf., of which I have specimens from Kelso, *Brotherston*, and Mildenhall [335]; *W. C. Barton*, shows the tubercles over the whole face as in the var. *tuberculatus* Celak., and that the small form, *parvulus* L., as represented in my herbarium, has the tubercles in one row only.

30. R. SCLELERATUS L., var. PUBESCENS R. & F. Fl. Fr. i., 112. An unusually hairy plant of *sceleratus* was sent to me by Mr J. M. Brown, B.Sc., from Kiveton Park, S. Yorkshire. Hooker, *Student's Flora*, Ed. 3, says "leaves glabrous;" Babington, *Manual*, Ed. 9, says that the lower leaves are glabrous. The only really glabrous plant that I have noticed is one from near Exeter. Plants from Staveley, Derbyshire; West Kirkby, Cheshire, and Grange Hill, Essex, have stems and leaves more or less hairy, though the pubescence appears to wear off the older leaves to a greater or less extent. E. DRABBLE. In *Fl. Berks* 17, 1897, I said that *sceleratus* was usually glabrous especially as regards the lower leaves, but that a small-flowered plant which grew near Loddon Bridge had the lower leaves pubescent (forma *pubescens* Corb. in Magnier Sclernia, 1893). A large series in my herbarium fails to show an entirely glabrous plant. The majority show the lower leaves glabrous or with a few hairs only, the upper part of the stem, upper leaves and sepals

usually pubescent. The var. *pubescens* I have from Jersey (Samaris), Berks, Oxon, &c. My non-glabrous plants are from Beaconsfield, Bucks, and Skinburness, Cumberland, but even these show scattered hairs on the upper part of the stem. Rouy & Foucaud describe it as "presque glabre ou pubescente." Syme (*Eng. Bot.* i., 31), as usual, excellently describes our plant which looks, in the plate, more glabrous than it is. In the original *E.B.* plate, 2833, the hairs are shown on the stems, &c., but owing to the wearing of the copperplate, the fig. 27 in the third edition scarcely shows them.

52 (2). *HELLEBORUS ORIENTALIS* Lam. Enc. iii., 96, forma. Alien. Thrace, Macedonia, Turkey. Sent from a wood near Steventon, N. Hampshire, ex Mrs YELDHAM. This species differs from *H. niger* in its sepals being broader and much imbricated. Of course there it is an introduced species. The sepals are suffused with pale pink colouring. R. W. Butcher got it in Bramdean wood, but it was originally dumped there from a garden. G. C. DRUCE.

163. *EROPHILA OEDOCARPA* Drabble in Journ. Bot. 45, 1926. Ashover, Derbyshire; Wallasey, Cheshire. It has terete fruits 3-4 mm. long by 2.25-2.5 mm. broad. A smaller plant than the Ben Lawers *inflata*.

303. BRITISH PANSIES. In *Journ. Bot.* 263, 1926, Dr E. Drabble writes on British Pansies of the "arvensis" section. There are descriptions of ten species as follows: *agrestis* Jord., *segetalis* Jord., *obtusifolia* Jord., *ruralis* Boreau, *Déséglisei* Jord., *subtilis* Jord., *arvatica* Jord., *derehicta* Jord., and two new species, *V. latifolia* allied to *obtusifolia* and *V. anglica* allied to *Déséglisei*. This is only the first part of the paper and no artificial key is given. A further instalment (the "tricolor" section) has recently appeared in Vol. lxxv. of the same Journal.

304. *VIOLA ANGLICA* Drabble in Journ. Bot. 269, 1926. Cultivated ground on the downs, St Margaret's Bay, E. Kent.

.304. *V. LATIFOLIA* Drabble, *l.c.* 266.

430. *HYPERICUM MONTANUM* L., var. *TYPICUM* Beck, with leaves glabrous, and var. *SCABRUM* Koch, with leaves scurfy on the underside. See C. E. BRITTON in *Journ. Bot.* 325, 1926. Probably the glabrous plant from Abinger, C. E. SALMON in *Herb. Brit. Mus.* and my specimens from Lambridge Wood, Oxon, belong here. The var. *scabrum* is, as Mr Britton says, the common British plant, but the clothing varies much in quantity. Specimens from Marlow and Burnham Beeches, Bucks; Park Place, Berks; and Effingham, Surrey, are but very slightly scurfy. Obviously this is less shown in shade-grown specimens.

488. *GERANIUM ROBERTIANUM* L., forma. Purley, Berks. Sent by C. E. HODGKIN, who says there was only one large plant. The stem is much thicker than usual, the plant more succulent and, although the

first few flowers were very rosy with no white, as in the ordinary form, the petals daily became more like the type. The leaves are quite extraordinary, resembling those of *Chaerofolium sylvestre* (L.), var. *latisectum* Dr. It will be interesting to observe its behaviour under cultivation. Mr H. BRITTON forwarded a form the extreme opposite of the above, as the leaf is divided into very narrow, straight segments. It came from Boston Spa, Yorks.

488. *G. ROBERTIANUM* L. Plants with petals distinctly 3-lobed at the tip are not uncommon at Freshwater, Isle of Wight, E. DRABBLE.

488. *G. ROBERTIANUM* L., var. *ALBUM*. See *Gard. Chron.* i., 188, 1926, where Mr A. T. JOHNSON mentions a variety differing from ordinary white-flower *Robertianum* in being of a fresh, pale, grassy green colour in leaf and stem and in having a dead white corolla. It came from Sir Charles Isham's garden at Menai Bridge, to which most of the plants were brought from western Ireland. Possibly this is a white-flowered form of Ostenfeld's *G. celticum*.

509 (3). *OXALIS LATIFOLIA* H.B.K. *Nov. Gen.* v., 237, t. 167. Alien, Mexico. *Hortal.* In a field, Bellozone Valley, Jersey, L. ARSENE.

517. *EUONYMUS EUROPAEUS* L., var. *LEUCOCARPUS* DC. *Prod.* ii., 4. Near Colwall, Hereford, F. M. DAY.

529 (2). *LUPINUS HIRSUTUS* L. Alien, *Medit.* Splott, Glamorgan, R. L. SMITH.

544. *ONONIS SPINOSA* L., var. *PROCURRENS* (Wallr.). Llandrillo-yn-Rhos, Denbighshire, July 15, 1925 [2799], C. E. BRITTON. Det. PAUL DE RIENCOURT.

562. *MEDICAGO FALCATA* L., var. *DIFFUSA* Schur *Enum. Pl. Trans.* 151. Tiges diffuses, grêles, allongées, à rameaux courts subunilatéraux; folioles petites; fleurs d'un jaune doré, en grappes courtes pauciflores. Gravel pit, Crayford, Kent [2340], G. C. BROWN.

573. *M. LITTORALIS* Rhode, var. *LONGISETA* Rouy *Fl. Fr.* v., 30. (= *M. littoralis*, race *cylindracea* (DC.), var. *longiseta* Rouy.) Selkirk, 1926, G. C. DRUCE & Miss I. M. HAYWARD. Det. PAUL DE RIENCOURT.

579. *M. HISPIDA* Gaertn., var. *TEREBELLUM* (Willd.). (= *M. pentacycla* DC., var. *breviaculeata* Rouy). Splott, Glamorgan, Miss VACHELL. Det. PAUL DE RIENCOURT.

579 (2). *M. PENTACYCLA* DC., var. *LONGIACULEATA* Rouy. Barry, Glamorgan, 1925, G. C. DRUCE.

580. *M. ARABICA* Huds., var. *LONGISPINA* Rouy *Fl. Fr.* v., 35. Epines subulées, très arquées, égalant environ la largeur du légume.

Penzance, Cornwall, BAILEY in *Hb. Druce*, as *denticulata*; Aberdour, Fife, BELL in *Hb. Druce*. Det. PAUL DE RIENCOURT.

597. *MELILOTUS INDICA* All., var. *TOMMASINI* Rouy, modif. *SEPTENTRIONALIS* Riencourt. Burton-on-Trent, Staffs, 1926, G. C. DRUCE.

598. *TRIFOLIUM MEDIUM* L., modif. *PEDUNCULATUM* (Ser.). Tweed-side, Dryburgh, Roxburgh, C. BAILEY; Gimmingham, W. Norfolk, A. R. HORWOOD in *Hb. Druce*. Det. PAUL DE RIENCOURT.

599. *T. PRATENSE* L., var. *PARVIFLORUM* Bab. Freshwater, Isle of Wight; Wallasey, Cheshire, E. DRABBLE; Falmouth, Cornwall, Major ORME; [Ref. No. 2334] Buckwater, Weymouth, Dorset, ex G. C. BROWN, is var. *heterophyllum* (Rouy under *T. brachyanthum* Rouy). This has the habit of *T. pratense*, var. *heterophyllum* L. & C. In this place [Ref. No. 2335] it verged towards type *pratense*.

611. *T. ARVENSE* L. (*AGRESTINUM* Jord.), var. *LITTORALE* (Jord.) = *PERPUSILLUM* Ser. Littlestone, Kent, Miss E. ARMITAGE.

611 (2). *T. GRACILE* Thuill. Loddon Bridge, Berks; Llanberris, Carnarvon, G. C. DRUCE, as *T. arvense*, var. *strictius* Koch. These are now identified by Mr PAUL DE RIENCOURT as Thuillier's plant which is treated as one of the four "formes" into which Rouy (*Fl. Fr.* v., 164) divides *T. arvense*. It is a less hairy plant with shorter ciliate teeth than the other three forms.

627. *T. HYBRIDUM* L. (*FISTULOSUM*), modif. *PROSTRATUM* Riencourt. Limpsfield, Surrey, H. E. FOX.

641. *ANTHYLLIS VULNERARIA* L., var. *MARITIMA* Koch, modif. *POLYPHYLLOIDES* Riencourt. Isle of Wight, G. C. DRUCE.

646. *LOTUS ULIGINOSUS* Schk., modif. *DECURTATUS* (Peterm.). Melton Charles and Little Sands, W. Ross, G. C. DRUCE. Melmerby, Cumberland, Rev. W. W. MASON. Det., as sub-modif. *TRANSIENS*, PAUL DE RIENCOURT.

648. *L. TENUIS* Kit., modif. *CRASSIFOLIUS*. Beaconsfield, Bucks, Mrs WEDGWOOD. Det. PAUL DE RIENCOURT.

648. *L. TENUIS* Kit., var. *SABULICOLA* Rouy, modif. *GRANDIFLORUS* Riencourt. Kettering, Northants, G. C. DRUCE.

650. *L. ANGUSTISSIMUS* L., forma *ABERRANS* Riencourt. Burton-on-Trent, Staffs, G. C. DRUCE. Det. PAUL DE RIENCOURT.

650 (1). *L. CONIMBRICENSIS* Brot. Alien, Medit. Splott, Glamorgan, R. L. SMITH.

[654. *ASTRAGALUS ALPINUS* L. Caithness, Mr MANSON, ex J. A. WEBB. Confirmation needed.]

669. *ORNITHOPUS PERPUSILLUS* L., var. *GLABER* Corb. Fl. Normandie 169. Lancresse quarries, Guernsey. Collected by J. E. LOUSLEY. It is a rare form as I have it only from Farley Hill, Berks, 1892, and Malvern, Worcester, in my large set from Britain. The legumes and leaves are practically glabrous. G. C. DRUCE.

681. *VICIA VILLOSA* Roth, var. *GODRONI* (Rouy Fl. Fr. v., 237, as a Race). In an old pasture field near Kilbryde, Corbridge-on-Tyne, Northumberland, R. B. COOKE.

698. *V. ANGUSTIFOLIA* (L.) Reich., var. *NIGRA* (L.). Blackhead, Kent, *Hb. N. B. Ward*. Det. PAUL DE RIENCOURT.

698. *V. ANGUSTIFOLIA* (L.), var. *LUGANENSIS* (DC.). See Gaudin *Fl. Helv.* iv., 512, as *V. sativa luganensis*. *Glabriuscula, foliis sub-septemngis, foliolis elongatis, truncato-retusis, mucronatis; summis acutiusculis (tantum obtusis vel acutiusculis)*. Frilford, Berks, 1926 [DD741]. In the Berkshire plants the leaflets are obtuse mucronate and the flowers are 2-3 in number, modif. *racemosa* (Beck.), G. C. DRUCE. Det. PAUL DE RIENCOURT.

700. *V. LATHYROIDES* L., var. *CIRRHIFERA* P. de Riencourt (as *V. Lathyroides*, var. *parva*, nov. sub-var. *cirrhifera* P. de Riencourt). Field near the sea, West Rounton, E. Norfolk, E. WATKIN in *Hb. Druce*.

909. *ALCHEMILLA PUBESCENS* Lam. In 1892 I sent many *Alchemillas* to M. Buser, of Geneva, for identification. These have been mislaid by M. Buser, so that I have never had them back. This year I called upon the veteran botanist, and found that he had lost his eyesight and was very deaf. He told me that my specimens had been determined by him, but that they were lost in his collection, and it was impossible now for him to find them. He distinctly remembered that *A. pubescens* from Britain was among them, and that it was the first British specimen he had seen, but unfortunately its distinct habitat he could not remember. He was surprised to hear that *A. argentea* Don was really native in Britain.

909. *A. COLORATA* Buser in Bull. Soc. Dauph. Ech. Pl., ser. iii., 99, 1892. Cave Hill, Belfast, Antrim, S. A. STEWART & G. C. DRUCE. The above has been kindly identified by M. Jaquet, who says:—"c'est étonnant mais enfin c'est cela *A. colorata* Bus. Sn. Pubescentes Catal. Fl. Valais, p. 111."

909. *A. CORIACEA* Buser in Bull. Soc. Dauph., ser. 2, iii., 108, 1892. This is the plant which was sent to the Club (See *Rep. B.E.C.* 342, 1915) by R. and M. CORSTORPHINE, September 1918, from roadside near Frick-

heim, Forfarshire. It was suggested that it might be a hybrid of *alpestris* and *minor*. Bucknall and White thought it was *alpestris*, and Salmon did not think it was of hybrid origin. F. Jaquet has recently identified it as *coriacea* Buser. It has the stem and petioles glabrous as contrasted with most members of this vulgaris group. The leaves are usually large, more or less undulated, with 7-9 lobes, the pubescence almost confined to the nerves on the under surface and to the leaf teeth. The flowers are fairly large, and the pedicels equal or are longer than the urceoles.

909. A. SALMONIANA F. Jaquet in Journ. Bot. 280, 1926. Found by C. E. SALMON on calcareous rocks at 600 metres in Cumberland. It belongs to the group Heteropodae, although it resembles the Splendentes in habit and colour of the leaves which are of a dark bluish-green. The specific name is well deserved, since Mr Salmon has done such excellent work on this genus.

932. ROSA DUMETORUM Thuill., var. SAVERYI W.-Dod. Silverton, Devon, G. B. SAVERY.

950. R. SPINOSISSIMA L., var. CIPHIANA [Sibbald] mihi = R. CIPHIANA, etc., Sibbald, Scot. Illust., 46, 1684 = R. SPINOSISSIMA L., var. b, Sm. Fl. Brit. ii., 537, 1800. Sent by Miss Temperley from the side of the Coquet above Rothbury, Northumberland. There was only one patch, several feet across and one to two feet high, surrounded by other wild rose bushes in quite a wild spot. The foliage of this extraordinary plant is that of *spinosissima*, but the petals are overlapping and of a bright purplish-red colour. Colonel Wolley-Dod says it is the best example of Sibbald's rose which he has seen, and that it is much darker than *f. rosea*, which is not darker than ordinary *canina*. Sibbald's Rose is figured (plate 2) in his *Scotia Illustrata* of 1684, and on p. 46 he writes "Rosa Ciphiana, seu Pimpinellae foliis flore eleganter variegato. Catal. Horti Medici Edinburgensis. Rosam hanc, quod in Praedio meo Ciphiano sponte nascitur, Ciphianum appellavi. Ea cum non occurrat apud ullum ex Scriptoribus Botanicis, quos mihi videre contigit, digna visa est quae describatur." Having described the root, stem, and foliage, Sibbald goes on to say:—"Inter quae ex pediculo suo calyx propendet, quo aperto exerit se flos simplex tinctus rubedine varia, in quibusdam saturatiore, in aliis dilutiore, in omnibus virgulis albis pulchre distincta. Cui deciduo succedit pomum coloris atro-rubentis rotundius et minus Cynorrhodi vulgaris pomis, id lanugine quadam et seminibus oblongo-rotundis, et ex inferne parte magis compressis, et ex basi latiore, cordis effigie in conum definentibus repletum. Flos eximium odorem de se fundit, qua pollet tenuitate, penetrantem." Sibbald alludes to the galls which infect leaves, and says:—"Nascitur in colle quodam Praedii nostri Ciphiano Austro observo, declivi admodum cautibus squalido, nec alibi, quod sciam, conspicitur. Perennis est planta. In hortos translata tum floris variegationem, tum suaviasimum odorem conservat. Eam

Sapphicus Versibus suse descripsi et vires ejus enarravi in Ode quadam, quae ad hujus libri valcem habetur." Although indexed in *Index Kewensis* as of *Sm. Fl. Brit.* ii., 537, 1800, there is no valid publication of the name in that work as no binomial is used. Under *R. spinosissima*, the var. b has the synonym, "*R. Ciphiana* seu *R. pimpinellae*," etc., cited but there is no additional information. In Smith's *English Flora* ii., 376, it is merely alluded to as var b. *Ciphiana*, he says, Sibbald gathered on his own estate in Scotland, and adds that the variegated rose is frequently cultivated in gardens. It is not referred to in the *Flora Scotica*, nor by Syme in *English Botany*, and hitherto there seems no valid publication of its name. Strictly speaking, this Coquet Rose is not typical *Ciphiana*, which is a variegated, not a concolorous, Burnet rose.

965. CRATAEGUS ARONIA Bosc. [2869]. Alien, Europe. On the border of an arable field above Leatherhead, Surrey, C. E. BRITTON. Allied to *C. Azarolus* L.

1061. OENOTHERA BIENNIS L., OE. GRANDIFLORA Sol. and OE. LAMARCKIANA De Vries in England, by Bradley Moore Davis in *Proc. of the American Phil. Soc.* lxx., 349, 1926. The author has given valuable details of the plants mentioned. The distinguishing features of *biennis* and *Lamarckiana* are said to be:—

	OE. BIENNIS.	OE. LAMARCKIANA.
Mature Buds <sup>♂</sup>	5.5-6 cm. long.	8.9 cm. long.
Sepal Tips.	3-4 mm. long.	6-8 mm. long.
Petals.	2-2.5 cm. long.	4-4.5 cm. long.
Stigma.	About 3 mm. <i>below</i> the tips of the anthers.	5-7 mm. <i>above</i> the tips of the anthers.
Stems.	Green above, the papillae never red.	With large red papillae over the green portions of stem.

He holds that *Oe. biennis* Smith Eng. Bot. and Smith Herb. is the same as that of the Sp. Plantarum. J. Shepherd collected it on sandhills a few miles north of Liverpool in 1805, the date when Sowerby drew his figure, which is not satisfactory, and which Dr Gates believes to represent *Lamarckiana*. A long list of localities of *biennis* is given. I am sorry I was away from Oxford when Dr Davis came so that my own collection was not seen by him.

Regarding *Oe. grandiflora* Sol. Davis holds that it has not established itself in Britain. He gives the contrasting features of it and *Lamarckiana* as follows:—

	OE. GRANDIFLORA.	OE. LAMARCKIANA.
Stems—	Pubescent, green above, reddish below, papillae never red, over green portions of stem.	Heavy pilose and puberulent pubescence, numerous red papillae over green portions of stem.
Leaves—	Smaller, lanceolate, distinctly petioled, plane, with less pubescence.	Larger, broader, short petioled or almost sessile, the larger crinkled, more evident pubescence.

Flowering Shoots—Clustered, approximate branching.	Frequently single long branches.
Inflorescence—More open, narrower bracts.	Dense spike, crowded, flat-topped, broader bracts.
Buds—Long slender hypanthium and slender cone.	Stronger hypanthium and much wider cone.
Sepals—Glabrous or almost glabrous.	With heavy pilose and puberulent pubescence.
Sepal-Tips—8-10 mm. long, attenuate, with relatively little pubescence.	6-8 mm. long, thicker and with heavy pilose pubescence.
Ovary—Glabrous.	Strongly pilose and puberulent.
Capsules—2.5-3 cm. long, glabrous.	2-2.5 cm. long, strongly pilose and puberulent.

*Oe. biennis* differs from *grandiflora* in its smaller flowers, in the stigma being below the anther tips, and in its being hairy. Solander named *grandiflora* from material grown at Kew. It was said to be introduced by John Fothergill in 1778 to whom John Bartram, its discoverer in Alabama in 1776, sent seeds. There is a specimen from Colchester (St Botolph Station, J. D. Gray, 1881) at Cambridge. Davis holds that *Lamarckiana* De Vries (not Seringe) was not introduced into Britain before 1870, the earliest specimen known being collected by Churchill Babington in a cornfield, not truly wild, at Corkfield [Cockfield], Suffolk, in 1871, and by A. French near the L.N.W. Railway Station in 1872. This habitat is in Northants not Oxford, as stated. He thinks it was introduced by Carter & Co., of London, who placed it as a novelty in 1860.

In addition to these three there are several narrow-leaved plants near to *Lamarckiana* which require further study. Some of these were sent out by Charles Bailey in his St Anne's gatherings. *Lamarckiana* itself is, Davis suggests, an impure species, behaving like a hybrid, and possibly owing its origin to a cross between *biennis* and some narrow-leaved large-flowered *Oenothera*.

1072. *CIRCAEA LUTETIANA* L. An albino form was sent by Miss COTTES from Hove.

222 (2). *LAGENARIA* Seringe in Mém. Soc. Phys. Génév. iii., p. 1, 25, 1825.

1074 (10). *LAGENARIA LAGENARIA* (L.). *L. VULGARIS* Seringe. *CUCURBITA LAGENARIA* L. Alien, Tropics. Dagenham, S. Essex, 1926, R. MELVILLE.

206 (4). *CUCURBITA* [Tourn.] L.

1075. *CUCURBITA PEPO* L. Alien, Orient., &c. Dagenham, E. Essex, R. MELVILLE.

1075. *CITRULLUS VULGARIS* Schrad, Alien, Africa. Dagenham, S. Essex, 1926, R. MELVILLE.

1101. *AMMI MAJUS* L., var. *GLAUCIFOLIUM* (L.) Noul. Waste ground, Bristol, W. Gloster, C. & N. SANDWICH.

1155. *TORBYLIUM MAXIMUM* L. Colonel Wolley-Dod writes that he heard that this plant was at Eton after his father took up residence there in 1850, and that it might possibly have continued to grow there for some years longer.

1160. *DAUCUS CAROTA* L., *lusus*. [2338] A form with green corolla, having purple tips, Portland, Dorset, J. COOPER, ex G. C. BROWN.

253 (2). *ARALIA* [TOURN.] L.

1171 (5). *ARALIA RACEMOSA* L. Alien, North America. Hortal. Newlands, Lanark, 1926, R. GRIERSON.

1172. *HEDERA HELIX* L. It may be propagated by its leaves which develop roots. See *Gard. Chron.* i., 82, 1926, with a plate showing a leaf which had been buried for thirteen months producing roots. R. T. PEARL & W. M. WARE.

1175. *CORNUS MAS* L. Alien, Europe. Hortal. Near Little Cheverell House, Devizes, Wilts. Several bushes in a hedge, but not near habitations, M. D. LUCE, ex Lady DAVY.

1278. *HELICHRYSUM BRACTEATUM* Andrews Bot. Repos., under t. 428. Willd. En. Hort. Berol. 869. Nicholson Gard. Dict., t. 201. Alien, Australia. Hortal. Giffnock, Renfrew, R. GRIERSON.

1285. *PULICARIA DYSENTERICA* S. F. Gray, *lusus ANGUSTIFOLIA*. An extraordinary form gathered by Major ORME in a marshy cover at Burghfield by the lane from Sheffield Bottom to Burghfield Mill, Berks. One large plant growing with the ordinary form. The plant has narrow linear leaves, one-eighth of an inch broad by two inches long. At their base there is a growth of whitish hair. Its appearance suggested some injury from insects, but Mr Swainton tells me the peculiarity is not due to galls, therefore it is probably owing to some physiological cause. The plant is much branched, and has a very distinct appearance. G. C. DRUCE.

1408 (30). *SENECIO TANGUTICUS* Maxim. Alien, China. Hortal. A well known tall, ornamental, yellow-flowered species found by the Cart. Newlands, Lanark, R. GRIERSON.

1458. *CENTAUREA GYMNOCARPA* Moris. Alien, Ins. Capraja. Hortal. Garden escape. Sand of St Brelade's Bay, Jersey, L. ARSENE. Named by Mr FRASER.

1468. *C. ASPERA* Willd., var. *AURICULARIA* DC. Quenvais, Jersey, J. W. WHITE. Det C. E. BRITTON, in *Wats. B.E.C.*, 1924-5.

1491. *PICRIS SPRENGERIANA* Poir. Enc. v., 310. Alien, S. Europe, Medit. Fowl-run, Bristol, W. Gloster, C. & N. SANDWITH.

1510 (2). *HIERACIUM BAUHINII* Bess. Alien, Europe. On an iron railway bridge, Great Bedwyn, Wilts, C. P. HURST.

1544. *H. STENOTUM* Dahlst. Modification. Glen Fiagh, Forfar, G. C. DRUCE. See Zahn 253, n. 19. One of the Oreades under *extensum*. Rev. J. Roffey refers it to *argenteum-nitidum*.

1547. *H. BASICRINUM* Zahn. (*H. SOMMERFELTII*, var. *TACTUM* LINTON). To this the Rev. J. Roffey refers a plant gathered on the path from the base of Topley Pike to Chelmerton, near the Churn Hole, Derbyshire, which Dahlstedt says is nearly allied to his *H. plumuligerum*. See Zahn 234.

1547. *H. SOMMERFELTII* Lindeb., var. *SPLENDENS* F. J. H. Clova, Forfar. I brought a root from Clova which Linton so named. It seeded freely, and has spread on to the adjacent walls. Specimens are distributed this year. It has now received three different names, the Rev. J. Roffey names DD794 *H. rubicundiforme* Zahn, *rubicundum* of F. J. H., not of N. P. See Zahn 204, where it is grouped with the Cerinthoidea, while *Sommerfeltii* is put (*l.c.* 272) among the Oreades. Dahlstedt thought it was one of the silvatica allied to *serratifrons*.

1561. *H. LEUCOGRAPTUM* Dahlst. Plants which I gathered in Glen Fiagh, Clova, Forfar, in 1926 were said to be allied to this Hawkweed by Dahlstedt. Zahn places *H. kalsoeense* Dahlst. (*l.c.* 188) under which it comes, in the Cerinthoidea. The Rev. J. Roffey refers the Clova plants to *H. clovense* Linton.

1568. *H. EXOTERICUM* Jord., forma *MACRODON* Zahn. Abergavenny, Monmouth. So named by Rev. J. Roffey. Dahlstedt says it is allied to *H. Koehleri* Dahlst. See Zahn 315. The Surrey *pellucidum* of Linton's set (n. 37) is identified with it by Zahn. *Koehleri* is put three species away from Jordan's plant in Zahn's Monograph.

1568. *H. LUCIDULUM* Ley. The Lambridge plant [Oxon DD95] Dahlstedt says is allied to *melanolepis* Almq., but differs especially in its narrower heads, with narrower and more acute phyllaries. Zahn puts it under *pellucidum* with which it was at one time identified. Another plant placed by Roffey under *lucidulum* from railway-cutting near Symond's Yat Dahlstedt says is allied to *lacerifolium* Almq. See Zahn 390, where it is placed among the Euvulgata-caesia = *H. triangulare* Zahn. It is quite unlike the Lambridge plant in facies.

1570. *H. INTEGRATUM* Dahlst. Steeple Aston, Oxford. Plants "nearly related to this," teste DAHLSTEDT. See Zahn 321, where it is placed near *varicolor*.

1603. *H. ORARIUM* Lindb. New Brighton, Cheshire. See Zahn 467, but Dahlstedt thinks it is near *H. polycomum* Dahlst., not of N.P., which Zahn (p. 901) puts in the true *Hieracia* as *H. polycomatum* Zahn.

1604. *H. SUBIMPRESSUM* Dahlst., nov. sp. Ab *Hieracio impresso* Norrl., cui est valde similis, haec species praecipue foliis minus dentatis, subintegris nec non pedicellis inter pilos dense—sat dense glandulosis pileique involucri dimidiatae glandulosi longioribus est distincta. From *H. impressum* this species differs by the scarcely dentate leaves and the very numerous glandules on the pedicels and the involucre. *H. impressum* is nearly destitute of glandules on the pedicels and heads. Glen Fiagh, Clova, Forfar, July 1926, G. C. DRUCE. *H. impressum* Norrlin is put by Zahn as a sub-species, n. 38, of *H. subramosum* Lönnroth.

1614. *H. MEGAPODIUM* Dahlst., nova sp. Caulis altus, 2-3 foliatus, inferne dense superne sparsius pilosus, supra medium ± stellatus ramos floriferos saepe ex axillis fol. summorum edens. Folia rosularia, longe petiolata, sub anthesi partim emarcescunt, ovalia-obovata, sparsim brevia et late dentata, caulina 2-3 inferiora, longe petiolata, ± ovalia—ovata-ovalia, basi ± descendente truncata late et sparsim dentata superiora ad basin grossius dentata, obtusiuscula, folium summum breve petiolatum—sessile basi truncata grossius dentatum, omnia supra sat laete viridia, subtus pallidiora. Anthela longa paniculata, polycephala, ramis ramulisque acacladium 10-15 mm. longum, longe—longissime superantibus, ± stellatis sparsim superne et praesertim in pedicellis densius glandulosa, sat pilosa. Involucrum parvum, basi ovata, ± atrovirens. *H. Dahlstedt in lit.* Ashdown Forest, Sussex, July 1926, G. C. DRUCE, with Countess BUXTON. Rev. J. Roffey speaks of it as "quite ordinary *H. diaphanoides*." Dr Zahn says it is a sub-species of *diaphanoides*, but it is different from the type. "Involucris obscuris basi tantum parco floccosis; pedicellis parce vel dispersis breviter pilosis; squamis pilis paucis brevibus obscuris orbitis; glandulis minus numerosis brevibus ± obscuris, etc." The plant is undoubtedly identical with *H. diaphanoides*, var. *apiculatum* Linton Brit. Hierac. n. 70, but differs sufficiently to be a good sub-species (*megapodium*) of *H. diaphanoides* Lindb. Dr Zahn sent a head of the true *diaphanoides* from Thuringia and the distinctness of the two plants is obvious. On the principle of the permanence of the trivial this would stand as *H. apiculatum* (Lint.) nov. comb. G. C. DRUCE.

1630. *H. SCYTOPHYLLUM* Omang. (See *Rep. B.E.C.* 997, 1925.) Named by Dahlstedt, from Ysphyty Cynfyn, Cardigan, it is identified as *scanicum* by Roffey, for which Zahn 367 does not give Britain. *H. scytophyllum* is described on p. 451, but no British locality is mentioned.

1640. *HYPOCHAERIS RADICATA* L., *lusus FASCIATA*. Flower-head fasciated with three divisions. Poltescue, Cornwall, Miss TODD.

1642. *LEONTODON HISPIDUS* L., var. vel *lusus CUCULLATUS* Dr. Ligules tubular. Melkinthorpe, Westmorland. Sent by H. BRITTON.

1645. *TARAXACUM ADIANTIFRONS* Ekm. *Vulgaria*. Stonesfield, Oxon, G. C. DRUCE.

1645. *T. ALIENUM* Dahlst., nova sp. *Vulgaria*. Folia laete viridiae, linearis-lanceolata, lobes in fol. deltoidea retroversis, subhamatis, ± dentatis, superioribus integris, acute, lobo terminali hastato parvo-mediocri, margine convexo, ± integro, obtusiusculo, lobis interioribus magis et acute dentatis acutioribus, lobo terminali magno inferne saepe denticulato, petioles et nervo mediano ± pallides. Scapi folia aequantes in parte superiore, saepe ± colorati. Involucrum parvum olivaceo-virescens, basi ovata. Squamae exteriores erecto-patentes-subrecurvae, ang. ovato-lanceolata—lanceolatae, anguste marginatae et ± violascentes, int. lineares omnes, apice ± purpurascentes. Calathium c. 70-75 mm. dia. Ligulae sat obscure luteae, marginales extus striae purpureo-violacea notatae. Antherae polliniferae. Stylus et stigma ± fuscescentes. The plant has a very close resemblance to *T. hamatum* as regards the outer leaves but differs in the paler colour and the leaves have less recurved lobes and narrower outer phyllaries, which are only a very little marginated. Sandy places, Penally, Pembroke; Swansea Bay, Glamorgan; Sandhurst, Berks [DD62]; Byfleet, Surrey; Bletchingdon, Charlbury, Studley [DD30], Coombe Wood, Oxon; Newport, Monmouth; Highnam, W. Gloster, G. C. DRUCE.

1645. *T. BRITANNICUM* Dahlst., nova sp. *Spectabilia*. Folia sat laete viridia, longa linearia—lineari-lanceolata, aequaliter lobata, lobis brevibus sat latis deltoideus—hamatis integris—parce dentatis sat approximatim lobo terminali triangulari—sagittato obtuso—breve acuminato, petiolis et nervo mediano sat lucide violascentibus. Scapi elongati, ± colorati. Involucrum breve crassum atroviride, basi—ovata. Squamae exteriores ± adpressae, ovatae—ovali-lanceolatae, ± albo marginatae. Calathium c. 40-45 mm. diam. Ligulae sat obscure luteae, marginatae subtus stria, fusco-purpureae notatae. Antherae polliniferae. Stylus c. stigm. virescens, siccus nigrescens. Achenium ± stramineum apice spinulorem caeterum fere laeve in pyramid. c. 0.7 mm. longam, breve conicam sensim abiens. Rostrum 7 mm. longum. Nearly allied to *devians* and *spectabile*. Oxford; damp places in sand-dunes, Penally, Pembroke, G. C. DRUCE.

1645. *T. CONVEXUM* Dahlst. Studley, Adderbury [DD49], Oxon; Kingston Hill, Berks, 1926, G. C. DRUCE.

1645. *T. EXPALLESCENS* Dahlst. *Vulgaria*. Byfleet, Surrey, G. C. DRUCE.

1645. *T. FAEROENSE* Dahlst., forma *ANGUSTIFOLIUM* Dahlst. Links of Boardhouse, Birsay, Orkney, June 1925 [2957B], H. H. JOHNSTON.

1645. *T. HAMATIFRONS* Dahlst. in *Trans. Bot. Soc. Edin.* 302, 1926. In its spotted leaves it has a resemblance to the *Spectabilia*, but its fruits remind us of *Vulgaria* to which group it probably belongs. In the form of its leaves and their lobes it is very like *hamatum*, but differs especially from it in its narrow recurved, not marginated, outer phyllaries. Clouster Brae, Stromness, Orkney, May 1925 [2902], H. H. JOHNSTON.

1645. *T. LAETIFORME* Dahlst. *Erythrospermae*. Sund dunes, Tenby, Pembroke, 1926, G. C. DRUCE.

1645. *T. LIMBATUM* Dahlst. *Erythrospermae*. Lindm. *Svensk Fl.* 575. Penally, Pembroke; Kenfig, Glamorgan; Weston-super-Mare, N. Somerset, G. C. DRUCE. Allied to this, teste DAHLSTEDT.

1645. *T. MACROLOBUM* Dahlst. Byfleet, Surrey, G. C. DRUCE.

1645. *T. NAEVOSIFORME* Dahlst., forma *MEDIANS* Dahlst. Frumland, Romsay, Orkney, 1925 [2919], H. H. JOHNSTON.

1645. *T. NAEVOSUM* Dahlst, forma *CROCATUM* Dahlst. South end, Stromness Town, Orkney, 1925 [2950], H. H. JOHNSTON.

1645. *T. ORCADENSE* Dahlst., n. sp. *Vulgaria*. Folia saturate viridia, subtus pallidiora, supra immaculata, ± lata, obovato-oblonga—oblonga, exteriora angustiora lingulato-lanceolata lobis brevibus deltoideis integris—denticulatis praedita, interiora magis magisque lata lobis crebris superne latioribus deltoides—subhamatis in margine superiore ± convexo denticulatis—integris, ± acutis, lobo terminali plerumque magus—maximo ovato—sagittato integro v. interdum ad basim ± dentato, breve acuto, mucronato, petiolis et nervo mediano ± violascentibus. Scapi plures, folia aequantes—superantes, glabri, ± colorati. Involucrum breve, crassum, atrovirens, basi ± ovato-truncata. Squamae exteriores ± reflexo-patentes anguste ovato-lanceolatae in pag. exteriori atrovirides, in pag. interiore pallidiores et saepe ± violascentes, interiores e basi latiore ± lineares apice obtusiusculo ± coloratae. Calathium 40-45 mm. dia. Ligulae luteae, marginales extus stria brauneo-violacea ornatae. Antherae polliniferae. Stylus et stigmata flavescentes. Grassy ditch at roadside, 150 feet above sea-level, Tiffyhall, Deerness, Mainland, 21st April 1922, and 12th May 1925; rocky crags on hillside, 700 feet above sea-level, north-east side of Ward Hill, Hoy, Orkney, 12th June 1925, H. H. JOHNSTON in *Trans. Bot. Soc. Edin.* 304-305, 1926.

1645. *T. PICEATUM* Dahlst. *Vulgaria*. Lindm. *l.c.* 583. Sunningwell, Berks, G. C. DRUCE. Allied to this, teste DAHLSTEDT.

1645. *T. PRAESTANS* Lindb. f. *Spectabilia*. Lindm. *Svensk Fl.* 578. High Force, Durham; Bletchingdon, Oxon; Tenby, Penally, Pembroke, G. C. DRUCE.

1645. *T. REFLEXIFOLIUM* Lindb. f. in Soc. Faun. et Fenn. 35, 1908. Fasc. Dahlst. 37, 1911. Dahlst. Nord Tarax. 105, 1912. Adderbury, Oxon, May 1926, G. C. DRUCE.

1645. *T. SCANDICUM* Dahlst. Erythrospermae. Lindm. Svensk Fl. 574. Seaton Carew, Durham, H. E. Fox; Hunstanton, Norfolk, G. C. DRUCE. Allied to this, teste DAHLSTEDT.

1645. *T. SUBLUTESCENS* Dahlst., nova sp. Folia longa anguste oblongo-lanceolata, obscure viridia, multiloba, lobis deorsum durescentibus subapproximatis, interlobiis brevibus laetiusculis, ± dentatis sejunctis, ± deltoideis, inferioribus angustioribus, apicibus patentibus-resupinatis, inaequaliter, acute et sat longe dentatis, superioribus latioribus grosse dentati, summis subintegris-retroversis lobi terminali ± ovato-sagittato, subintegro, in fol. intimes, magno et saepe magis dentati ± obscuro, petioles et nervo mediano saepius valde violascentibus. Scapi folia ± superantes basi apiceque ± colorati. Involucrum mediocre, ± atrovirens basi ovato-truncata. Calathium 45-50 mm. diam. Ligulae sat obscure luteae marginalis, extus stria obscure cano-purpurea, notatae. Antherae polliniferae. Stylus cum stigma ± fuscescens. Achenium brunno-stramineum, c. 3-3.5 mm. longum c. 1 mm. latum, apice acute spinulorum caeterum crebre tuberculatum, pyramide c. 0.7 longa, conica. Rostrum 8.5-9 longum. Gairloch, West Ross; Oxford, G. C. DRUCE.

1645. *T. SUBSIMILE* Dahlst., ad interim. Plants in fruit and sparingly in flower. Style and its two recurved branches yellow. Fruit-receptacle flattish-convex. Achenes pale brown. Dr Dahlstedt, in a letter to Col. H. H. Johnston, says:—"Ab *T. naevoso* Dahlst., cui verosimiliter est affine, foliis longius et acutius lobatis, lobis plerumque longioribus acutis interlobiis angustioribus, lobo terminali acuto majore triangulari vel triangulari-hastato, colore petiolorum et nervi mediano pallidiore nec non squamis exterioribus magis angustis sat diversum videtur." Native. Common. Roadside, fifteen feet above sea-level, Carrick House, Eday, Orkney, 7th July 1923, H. H. JOHNSTON in *Trans. Bot. Soc. Edin.* 89-90, 1924.

1645. *T. TANYLEPIOIDES* Dahlst., n. sp. A *T. tanylepide*, cui est sat affine, haec species foliis latioribus lobis plurimis longis potentibus—hamatis crebris, lobo terminali latiore et majore brevi, squamis exterioribus angustioribus haud marginatis saepius valde reflexis, interioribus sub apice callosis-leviter corniculatis nec non antheris ut videtur polliniferis satis esse distinctum videtur. This form seems to be very nearly allied to *T. tanylepis*, but seems to differ from it especially through its broader leaves with longer lobes, short broad end lobes and polliniferous anthers. Native. Common. Shell-sandy banks at seashore, ten feet above sea-level, Links of Boardhouse, Birsay, Mainland, Orkney, 8th June 1925, H. H. JOHNSTON in *Trans. Bot. Soc. Edin.* 303-304, 1926.

1663. *TRAGOPOGON MINUS* Mill, lusus *COMPOSITUS*. Flower-head compound as in the Hen-and-Chicken Daisy, the ligules very narrow, and the plant barren. Rock Ferry, Cheshire. Sent by Mr H. E. GREEN.

1743. *ANAGALLIS ARVENSIS* L., var. *SERPYLLIFOLIA* (Lej. & Court.). In a damp dune-bottom, Newborough, Anglesey, Col. M. J. GODFREY, ex W. G. TRAVIS.

1804 (7). *ANCHUSA MYOSOTIDIFLORA* Lehm. Asp. 234. Alien, Siberia. Near Moreton Hampstead, Devon, in profusion for one to two hundred yards by the roadside, 1926, Colonel HAIG.

1813. *MYOSOTIS PALUSTRIS* Hill, var. *LAXIFLORA* DC. Arisaig, W. Inverness, 1903; Hertford; Bulstrode, Bucks, G. C. DRUCE, teste A. E. WADE.

Var. *COMMUTATA* R. & S. Bladon, Oxon, 1915, see *Rep. B.E.C.* Cothill, Berks [AA301], 1923, G. C. DRUCE, teste A. E. WADE.

1815 (2). *M. BREVIFOLIA* C. E. Salmon in Journ. Bot. 294, 1926. Ullswater, Heltondale, near Hawes Water, Cross Fell, Westmorland; Thirlmere, Borrodale, Melmerby, Cumberland; Moffat, Dumfries, are cited as localities. It has smaller calyces and shorter fruiting pedicels than *repens* or *caespitosa*. It has shorter and blunter leaves, longer calyx segments and larger flowers than *caespitosa*. Its appressed pubescence, smaller leaves on stolons, longer pedicels, and calyx segments distinguish it from *repens* and from *palustris* it is known by its longer calyx segments, shorter styles, and smaller flowers.

1821. *M. VERSICOLOR* Sm., var. *MULTICAULIS* Bosch. Benham, Berks, 1892, G. C. DRUCE, teste A. E. WADE.

Var. *DUBIA* R. & F. Menmarsh, Oxon; Filby, Norfolk, G. C. DRUCE.

1850. *SOLANUM CAPSICASTRUM* Link. Alien, Brazil. Dagenham, S. Essex, 1926, R. MELVILLE.

1850. *S. ACULEATISSIMUM* Jacq. Alien, S. America. Dagenham, S. Essex, 1926, R. MELVILLE.

1850. *S. SISYMBRIFOLIUM* Lam. Alien, N. America, Mexico. Southwick, Sussex, Miss COTTES. Det. A. THELLUNG.

1858. *HYOSCYAMUS MUTICUS* L. Mantissa i., 45. Alien, Egypt, etc. Dagenham, S. Essex, R. MELVILLE.

1873. *LINARIA LINARIA* (L.) Karst., *lusus ECALCARATA* Dr. Near Ilfracombe, N. Devon. Sent by Mr W. T. BOYDON RIDGE, who says he found a similar specimen there eight years ago. It has the mouth of the corolla wide open and is without a spur.

1880. *L. PELISSERIANA* Mill. Alien. Found, Dr Dukinfield Scott tells me, by Mrs E. YELDHAM, in rough ground attached to the old farm house, a cottage adjoining Dr Scott's garden at Great Oakley, N. Hants. Although the ground is now uncultivated, it is so close to the cottage

that it may well have once been part of the garden. The plant has appeared for several years in succession. Dr Scott has no record of its being cultivated in his garden or that of the cottage, nor has he seen it in the neighbourhood. Still it is cultivated, and once, he says, he saw it in a garden near Wytham, Berks. Recorded by Mr J. Rayner from the Hampshire locality.

1908. *VERONICA CHAMAEDRYS* L., var. *LAMIIFOLIA* Beck Fl. Nord-Oest. ii., 72, 1052, 1893. See C. E. BRITTON in Journ. Bot. 326, 1926. Several localities in Surrey and elsewhere in Britain. To this belongs a long-petioled, broad-leaved plant from Raehill, Dumfries.

1914. *V. SERPYLLIFOLIA* L., var. *ROTUNDIFOLIA* Beck. Between Hindhead and Frensham, Surrey, BEEBY, 1882. See C. E. Britton in Journ. Bot. 326, 1926. It may be the *V. rotundifolia* of Schrank. A plant from Cowden, Kent, seems to come under this. The leaves are three-quarters of an inch long by nearly five-eighths broad, with nearly entire margins, the inflorescence  $2\frac{1}{2}$  inches long. A plant from St Helier's approaches this.

1924. *V. AGRESTIS* L., var. *MICRANTHA* Drabble in Journ. Bot. 25, 1926. On boulder-clay at Finchley, Middlesex. It has a minute and pale-coloured corolla.

1960. *MELAMPYRUM PRATENSE* L. (sub-sp. *VULGATUM*), var. *VULGATUM* Beck, sub-var. *LAURIFOLIUM* Beauv., forma nova *SUBVALIDUM* Beauv., ined. Caulis  $\pm$  debilis, circa 1 mm. diam.; folia caulina  $\pm$  anguste lanceolata, cetera ut in sub-var. *typica*. Wellington College, Berks [R5111], July 1918, G. C. DRUCE. A variety from Hambledon, Hants, requires further study, G. C. DRUCE.

1960. *M. PRATENSE* L. (EU-PRATENSE), var. *SCOTIANUM* Beauv., forma nova *PYGMAEUM* Beauv. Tuba pygmaea; inflorescentia ad 11 nodum situm. At 3000 feet, Ben Bhrotain, Aberdeen, H. E. FOX; Cairngorm, G. C. DRUCE. Dr Beauverd now considers *scotianum* deserves varietal rank.

1960. *M. PRATENSE* L. (sub-sp. *VULGATUM*), var. *INTEGERRIMUM* Döll, sub-var. *PSEUDOSYLVATICUM* Beauv. Hareshaw Burn, Northumberland; Braemar, S. Aberdeen [AA.322], G. C. DRUCE.

1961. *M. SYLVATICUM* L., var. *EDENTATUM* Schur Enum. Pl. Transs. 506, 1866. Crow Glen, Belfast. G. C. DRUCE.

1990. *MENTHA LONGIFOLIA*  $\times$  *SPICATA* = ? *M. NOULETIANA* Timb.-Lagr. Near Berrow, Somerset, Rev. E. S. MARSHALL; Belfast, escape from cultivation. See Journ. Bot. 282, 1926, J. W. WHITE.

2056. *STACHYS SYLVATICA* L. A teratological form with the corolla nearly regular. Sent by Mr ARNOLD COBB, in September, from Tilehurst, Berks.

[2093. *PLANTAGO MONOSPERMA* POURT. See *Journ. Bot.* 15, 1926. This plant exists in the herbarium of that untrustworthy botanist, Mr W. Andrews, labelled *P. argentea*, Great Aran Isle, 1849. Search should be made as, until verified, the record cannot be accepted as evidence of its occurrence in the Irish Aran.]

580 (2). *TELANTHERA* R. Br. in Tuckey Congo 477, 1818.

2116 (31). *T. FICOIDEA* Moq. *ALTERNANTHERA FICOIDEA* R. Br. Alien. Tropical America. Avonmouth, W. Gloster, C. & N. SANDWITH.

2117. *CHENOPODIUM RUBRUM* L., forma *ANGUSTIFOLIA* Murr. in litt. Tiverton, Devon, Lt.-Col. G. WATTS.

2123. *C. OPULIFOLIUM* × *STRIATUM*. Barry, Glamorgan, October 1926, with R. SMITH, R. MELVILLE, and Miss VACHELL. To Miss Vachell we dedicate the hybrid as *C. Vachelliae*.

2124. *C. ALBUM* × *ZCHACKEI* = *C. SUBCUNEATUM* Murr. Colchester, Essex [2360], G. C. BROWN; Burton-on-Trent, Staffs, G. C. DRUCE. The latter has mucronate leaves.

2124. *C. ALBUM* × *FICIFOLIUM* = *C. ZAHNII* Murr. Burton-on-Trent, Staffs, G. C. DRUCE and Sir R. CURTIS.

2124. *C. ALBUM* × *OPULIFOLIUM*, var. *MUCRONATUM* = *C. PREISMANIANUM* Murr. Barry, Glamorgan, G. C. DRUCE.

2143. *ATRIplex LITTORALIS* L., var. *DENTATA* Hornem. Newport, Monmouth, on waste ground, R. MELVILLE. Det. A. THELLUNG. A more slender plant than our var. *serrata*.

2151. *A. PALAESTINA* Boiss. Alien, Syria, etc. To this probably belong flowerless plants from Galashiels, G. C. DRUCE & Miss I. M. HAYWARD, and Splott, Glamorgan, G. C. DRUCE & R. L. SMITH.

2177. *POLYGONUM HYDROPIPER* L., var. *DENSIFLORUM* Braun. Brox, Surrey, C. E. BRITTON in *Journ. Bot.* 328, 1926. Distinguished from the type by its taller stem, many spreading branches, broad leaves, and very compact green inclined spikes. Mr Britton has sent specimens to the Club.

2188. *P. PULCHELLUM* Lois. Alien, Medit. Burton-on-Trent, Staffs, G. C. DRUCE. Allied to *arenarium* and *Bellardi*. Det. R. DANSER.

2252. *URTICA URENS* L., var. *PARVIFOLIA* Weddell in DC. Prod. xvi., pars i, 48 = *U. PARVULA* Blume. See Rouy & Fouc. Fl. Fr. xii., 274. Benington, Lincoln, Rev. W. WRIGHT MASON. Leaf blades  $\frac{3}{4}$  in. long,  $\frac{1}{4}$  in. broad, deeply and acutely toothed, on leaf stalks  $\frac{1}{4}$  in. long. An extremely pretty plant.

2290. *POPULUS TREMULA* L., var. *BROWNII* Dr. Leaves five-eighths to seven-eighths in. long by half to three-quarter in. broad, glabrous. A pretty form, and one not previously noticed by me. Gathered by G. C. BROWN [2263] on Tiptree Heath, N. Essex, June 1926.

2487. *POTAMOGETON DRUCEI* Fryer. Towards the end of a note on this Dr Druce mentions *P. nerviger* Wolfg. and *P. Griffithii* A. Benn., remarking that Hagström says of the Welsh plant "its hybrid origin, however, is beyond all doubt, and may now-a-days be disputed in earnest by nobody." Well, I did so in *Journ. Bot.* 15, 1919. I have Wolfgang's plant from himself, and grew *Griffithii* with *praelongus* and *alpinus* for six years, and *Griffithii* has nothing to do with *nerviger*, which is essentially an *alpinus* ally. *Griffithii* is an isolation species like *Salmo nigropinnis* (the black-finned Trout) of these isolated Welsh Lakes. They are found nowhere else in the world. A. BENNETT.

2508. *P. FOLIOSUS* Raf. On page 787 of the Secretary's Report of the Botanical Society and Exchange Club for 1925 it is stated that Prof. Fernald (U.S.A.) in a letter to Mr D'Urban writes that *P. foliosus* "is a generally distributed species from tropical America northwards, reaching its north-eastern limits in Nova Scotia, Prince Edward Island, and in Quebec, south of the St Lawrence." This is not so. It reaches its northern limits at Hudson's Bay, 57 degs. north latitude; Cumberland House, 55 degs. north latitude, and Lake Mistassim, 50 degs. 25 min. north latitude, A. BENNETT.

2514 (2). *P. PENNSYLVANICUS* Willd. herb. ! (C. et S.). In the *Potamogetons of the British Isles* the statement is made that this species was "most likely introduced with cotton, as it is one of the common species in the United States, being abundant in the States where cotton is grown." Prof. M. L. Fernald writes that the above statement amazes him since "*P. pensylvanicus* is, as far as we know, quite unknown from the cotton belt, the latter region being a fairly well defined area of the Southern United States; the pondweed being an essentially northern species occurring in two areas—one extending from southern Labrador to the mountains of northernmost Georgia, the other along the Pacific slope from Alaska to California." I am amazed at his statement. The species grows in Georgia, Glasgow herb. ! Beyrich sp. 1834; Carolina, Nugel sp. 1842; Louisiana, Melvill herb. !; Virginia, Vienna herb. !, and Tennessee, Gattinger sp., 1878. Here we have five of the States in which it occurs, and where cotton is grown. So long ago as 1795 these States exported 5,250,000 lbs. of cotton which was greatly increased when Whitney invented his Cotton-jig. Prof. Fernald seems to have forgotten his letter of June 15, 1908, printed in the *Naturalist* for October 1908, p. 378, when he writes that the species may be a native of Great Britain. I sent his letter to the lady, Miss Vigin, who found the plant in Yorkshire. She replied:—"The plant grows exactly at the spot where the water from the cotton mill enters the canal. That is an absolute fact, which I can vouch for. So if you write to the American

I hope you will tell him that he is mistaken (!) about its 'polar origin'. For further notes on the species, as introduced to Great Britain, see *Naturalist* 1908, p. 10 and p. 373, and *Trans. Bot. Soc. Edin.* 1908, p. 311. A. BENNETT.

2639. *SETARIA VIRIDIS* Beauv. var. *WEINMANNI* (R. & S.) Dr. = *Panicum WEINMANNI* Roem. & Schult. Syst. ii., 490, 1817 = *S. PURPURASCENS* Opiz. Spikelets and bristles more or less purplish or violet. Ware, Herts, Miss TROWER and G. C. DRUCE; Grimsbury, Northants; Abingdon, Berks, G. C. DRUCE.

2666. *ALOPECURUS GENICULATUS* L., var. *TUBEROSUS* A. & G. Salt marsh by Colne, Wivenhoe, N. Essex, June 26, 1926 [2343], G. C. BROWN. The earlier trivial var. *BULBOSUS* (Sonder Fl. Hamb. 32, 1851) was rejected by Ascherson & Graebner to avoid confusion. G. C. DRUCE.

2737 (2). *CYNOSURUS ELEGANS* Desf. Alien, Medit. Splott, Glamorgan, 1926, R. MELVILLE and R. L. SMITH.

2737. *C. ECHINATUS* L., var. *PURPURASCENS* Ten. Burton-on-Trent, Staffs, G. C. DRUCE & Sir R. CURTIS.

2748 (2). *ERAGROSTIS BARRELIERI* Daveau. Alien, Medit. Avonmouth, W. Gloster, C. & N. SANDWITH.

2748 (3). *E. PILOSA* Beauv. Alien, Tropics. Avonmouth, W. Gloster, C. & N. SANDWITH; Grays, Essex, R. MELVILLE.

2830. *AGROPYRON REPENS* Beauv., var. *CAESIUM* (Presl) Beck. See C. E. BRITTON in *Journ. Bot.* 328, 1926. Beck separates this from ordinary *repens* in having the leaf-sheaths hairy not glabrous. It is a strong glaucous form which Ascherson and Graebner says remains constant in culture. This also exists as a form with clear green leaves (var. *viride* Marsson), which Mr Britton says occurs in Surrey as well as the var. *caesium*. In the *Flora of Oxfordshire* (long printed off) *caesium* is included from Banbury, my No. 7116, and Binsey Lane, but a specimen from Milverton, Warwick (H. Bromwich in *Rep. B.E.C.* 1887), which Hackel called *A. repens*, var. *arvense* Reichb., has a few scattered hairs on the leaf sheaths, but it is not caesian. Other plants show a series of hyaline dots, but the hairy sheathed plant is evidently rare.

2844 (4). *TRITICUM (AEGILOPS) BICORNE* Jaub. & Spach. Alien. Bristol, Somerset, C. & N. SANDWITH.

2876. *EUPTERIS AQUILINA* (L.) NEWM., var. *MULTIFIDA* (Wollaston). Burnley, Lancs, C. R. RICHINGS, ex H. BRITTEN.

2878 (2). *BLECHNUM ALPINUM* = *LOMARIA ALPINA*. Alien, Brazil. See Nicholson in *Gard. Dict.* iv., 293, t. 415. Growing freely in cracks of flags and on old walls, Dunmore, Donegal, F. R. BROWNING.

## NOTES ON PUBLICATIONS, NEW BOOKS, ETC., 1926.

(Owing to exigencies of space and the erratic receipt of foreign works this is necessarily incomplete.)

ALMQUIST, ERNST. Zur Artbildung in der freien Natur. In this valuable contribution to the Acti Hort. Berg. 37-76, 1926, 12 hybrids of *Bursa pastoris* are figured, and a long account of that most interesting plant, *B. Hegeri*, is given. References are also made to *Lychnis alba* × *dioica* and *Geum intermedium*.

ANNALS OF APPLIED BIOLOGY. Edited by W. B. Brierly & D. Ward Cutler. Camb. Univ. Press, 2 parts, 1926; 24/-.

ANNALS OF BOTANY. Editors, V. H. Blackman, Sc.D., F.R.S.; R. Thaxter, M.A., Ph.D., and others. Oxford University Press—Quarterly, 15/-; Yearly, 45/-.

ARBER, AGNES. MONOCOTYLEDONS: A MORPHOLOGICAL STUDY. pp. 258, fig. 160. Cambridge University Press, 1925; 21/-. Dedicated to the memory of Ethel Sargent, this handsome volume is one of the series of Cambridge Botanical Handbooks, of which works on Ferns, Lichens and Fungi have appeared already. This was to have been produced by the pen of the talented Miss Sargent but her lamented decease brought it to nought. No adequate material had been left for the work so Miss Arber had to take up the torch which had been kindled and yet it had to be illuminated in a different manner from that which had been used by Miss Sargent. This change would not have been resented because as Miss Arber in her graceful dedication says "She was keenly alive to the fact that scientific hypotheses have in their nature no pretension to permanence, and they should be judged by their capacity for bringing light to further generations, to which, in turn, they yield their place. To work with Ethel Sargent was to realise the pursuit of science as an unending adventure of the mind: in dedicating this book to her memory, I dedicate it to the very spirit of research." This important volume has been reviewed by Dr Rendle at considerable length and with great ability. One fact emerges—that the Monocotyledons have not necessarily arisen from the Dicotyledons as the result of adaptation to a special mode of life. There is no logical necessity for two cotyledons, and the prolonged search for the missing leaf is because botanists have been hypnotised by their own terminology. The author says we must, at least for the moment, give up the hope of bridging the gulf which separates the great Angiospermic groups. The contents of this very thorough and scholarly work include The Principles of Morphology; The Root; The Axis; Description of the Foliage Leaf and its Interpretation; The Prophyll; here the view is adopted that the phylloclades are

leaves—in Rusceae the activity of the axillary bud may be confined to the production of the single leaf, the prophyll; The Seedling and its Significance; The Reproductive Phase; Taxonomy and its Interpretation; Parallelism in Evolution; and a copious Bibliography. Miss Arber in her concluding sentence seems to have become converted to a calvinistic theory of the universe since the conception, foreshadowed nearly a century ago by Theodor Schwann, is quoted with commendation "That not only the eternal harmony of the stars, and the changing phases of the inorganic world, but even the course of the streams of life in its passage down the ages, were determined once and for ever when the reign of law began in the dawn of all things."

BAILEY, L. H. Enumeration of the Eubati native in North America. *Gentes Herb. i.*, 200-300, tt. 91-139, 1925. They are arranged in 11 groups of which a key is given. About 15 new species are described.

BLATTER, ETHELBERG S. J., Ph.D., Professor of Botany at St Xavier's College, Bombay. *THE PALMS OF BRITISH INDIA AND CEYLON.* pp. xxviii. 600, tt. cvi., text figs. 49, maps 2. Oxford University Press, 1926; 45/-. In these pages we have already reviewed important works and monographs such as Percival's "Wheat Plant," Goulding and Bigwood on "Cotton," Gambier's "Timbers of India," Copeland's "Rice," and Weatherwax on "Maize," as well as more specialised monographs such as Millais' "Rhododendrons." Now we have from a botanist who has written a flora of that "cinder-heap," Aden, this handsome volume, copiously illustrated and splendidly produced, dealing with the Palms of our great dependency. That distinguished botanist, Professor Drude, the author of "The Vegetation of the World," also monographed the Palms. I remember, on being introduced to him, he said he had once been advised to write his name quite clearly as there was a British botanist whose name only differed by a single letter. I said "Yes, Professor Drude, but you took the Palm in more senses than one." The subject of Palms also had Professor Beccari as a brilliant exponent. In this monograph Professor Blatter pays tribute to the arrangement used by Drude in "Die Natürliche Pflanzenfamilien" which he chooses to adopt rather than the one used in "The Flora of British India." In herbaria the study of this group is well-nigh hopeless as they are such an intractable lot to bring on to a herbarium sheet. Professor Blatter says that even the most elaborate description and detailed analysis will never give such an idea of the plant as a good photograph, and he has very generously illustrated the book by many vivid photographs. It may be recalled that Linnaeus only described 15 species. To these Ruiz & Pavon (Ruiz was professor of Botany at Madrid) added 8 and Humboldt and Bonpland 20. Kunth in his "Enumeratio" of 1841 included 356 species. These were increased to 440 with the additions made by Griffith in India. Prof. Blatter says that about 1100 species are now recognised. So far as the East is concerned in Roxburgh's "Flora of India" (he died in 1837) 41 species are mentioned. Griffith, an assistant surgeon, was the

botanist to whom the discovery of a large number of plants, including Palms, is due. He travelled very widely, accompanying Wallich to Assam. His posthumous work on "The Palms of the British East Indies" was published in 1850. Professor Blatter, in his Introduction, gives a general description of Palms and their geographical distribution. The only European species is the Mediterranean *Chamaerops humilis*. The family consists of about 130 genera. In British India and Ceylon about 100 species are known, the most conspicuous being *Phoenix sylvestris*. *Borassus flabellifer*, the Coco-nut, and the stately Talipot, *Corypha umbraculifera*. A convenient list of authors is given with the abbreviations of their names. Then follows a detailed description of the indigenous species beginning with the Wild Date Palm, *Phoenix sylvestris*. The generic name was given not from "rising from the ashes" but from purple-coloured, an allusion to the colour of the fruit. Of this tree two whole page illustrations are given. From the sap of it a coarse sugar is obtained. *R. zeylanica*, the Ceylon Date Palm, was described by Trimen. The ordinary Date is *Phoenix dactylifera*, and seedlings of this occur on rubbish heaps, especially near large towns in Britain, to which the vigilant watch of the Sanitary Inspector has condemned some unwholesome material that has been exposed for sale. The excellent account given by De Candolle in his "Origin of Cultivated Plants" is quoted. A sap is obtained by cutting off the head of the tree. It contains sugar and may be drunk as a beverage, but it speedily ferments. From this the spirit, Arrack, is obtained. The cause of date mark or Baghdad boils was for a long time attributed to the produce of the date, but it is now recognised to be due to mosquitoes which convey a small protozoon to mankind in their venomous bites. The Talipot Palm grows to 80 feet high and a magnificent sight is presented as one saw it near Kandy. There is a wonderful avenue of them at Peradeniya. In this garden too there is the striking *Licuala grandis*. Another remarkable illustration is that of the Palmyra Palm, *Borassus flabellifer* in Northern Ceylon, the juice of which affords Toddy. A great deal of ginger beer there is made of Toddy. Jaggery Sugar is another product, as is Ceylon vinegar. The mesocarp, known as Palmyra pulp, is soft, mellow and luscious. Lengthy details of the preparation of these products are given. It may be added that the leaves are largely used for thatching or even as writing material. An excellent account of the Seychelle Island Palm is included as well as a photograph of it in fruit in its classic home on Praslin Island. Camoens mentions the Coco de la mer in his epic of the 16th century. The tree reaches a height of 100 feet. *Raphia vinifera*, as the name suggests, also yields a wine which is obtained by cutting off the terminal inflorescence when the "wine" is procured in large quantities. The Sago Palm, *Metroxylon Sagus*, yields sago which is obtained by splitting the tree into logs from which the soft farinaceous material, after proper elutriation, forms the well-known food substance. A tree of 15 years will yield from 600-800 pounds. Fifty-two species of *Calamus* are described. Some of them afford the rattan of commerce. *Calypota urens* also produces fibrous cords. It, too, yields a kind of Toddy.

The specific name is due to the irritating juice of the fruit. *Arenga saccharifera* is also another Toddy-yielding species, and it has many other important economic uses though the juice of its fruit is irritating. The magnificent avenue of *Oreodoxa oleracea* at Peradeniya is shown. The young tops, like those of many other species, are eaten as cabbage. In beauty *oleracea* is excelled by its congener, *O. regia*, a native of the West Indies. It is to be seen in its glory in the great avenues at Rio. The last species we can find room to allude to is *Areca Catechu* from which the Betel Nut is obtained. Round it much Eastern literature centres. It is a splendid tree up to 100 feet high, but its native home is uncertain. It is wild enough in the Attabadi Valley in Malabar at about 300 feet as Mr Fisher, who is cited here, told me. The Betel has been used as a masticatory since very remote times. The sliced seed is wrapped in a leaf of *Piper Betel* and a little lime is added. The inspissated extract forms the Catechu or Cutch of commerce, a very astringent substance full of tannin. The Oil Palm of Tropical Africa is not indigenous in India. The kernels yield a white fat much used in soap making. Space forbids an account of the Coco-nut, which needs a book to itself, except to point out that Cocoa-nut is a misspelling. The word Coco is derived from the likeness of the Nut to the head of a monkey coco. Botanists must be grateful for the production of such a readable and accurate account of a family not less remarkable for its beauty than for its economic importance. The claims made on the wrapper are not in the least exaggerated and in order that they may be put in a more permanent form, they are reprinted here. "Many monographs have been written on particular groups of palms; this volume is the first comprehensive survey of the whole range of palms found in British India and Ceylon, including foreign species which are grown only under cultivation or for ornamental purposes. Indeed it is the great number of these introduced foreign palms, and of separate monographs dealing with them, that makes a survey of this type so necessary. The botanist will find the treatment of the subject scientific and exhaustive; but the needs of the amateur of palms, of the economist, and even of the anthropologist have not been over-looked, and there are full notes on the gardening, the commercial products, and the folklore of palms. There are 106 full-page plates and numerous figures in the text; also a comprehensive bibliography and index."

BOTANICAL ABSTRACTS. Vol. xv. Entries 1-5778. January-June 1926. Published by Williams & Wilkins Co., Baltimore. Editor-in-Chief, J. R. Schramm; Taxonomy Editor, J. M. Greenham.

BOWER, F. O., Sc.D., LL.D., F.R.S. THE FERNS (FILICALES). Vol. ii. THE EUSPORANGIATAE AND OTHER RELATIVELY PRIMITIVE FERNS. pp. 344, figs. 311-580. Cambridge University Press, 1926; 30/-. Emeritus-Professor Bower, with his well-known literary skill, quotes the sup-  
pliants of Euripides—

" On a far-looking tower I stood to watch  
And three tribes I beheld, of war bands three."

He claims that in the first volume he established and detailed twelve criteria of comparison which enabled us to take our place on a tower of vision. Thence we may witness the phyletic advance. As the armies in the play were seen to be formed in three distinct columns, each moving independently, so also the three main phyla of Ferns, which our comparative study will disclose, may be held to have progressed independently in their evolutionary march, their separate movements being discernible by the observer from his point of vantage—each phylum taking its course; in fact the evolutionary movements are polyphyletic. The present volume deals with the evolutionary progression of earlier geological times. Nine pages are devoted to the Introduction. The Coenopteridaceae, first treated of, are all fossils of the Palaeozoic type and are distinct from any living Fern. Following them is the chapter on the Ophioglossaceae, which have living representatives including *Botrychium* with 34 species, the monotypic *Helminthostachys* and *Ophioglossum* with 43 species, as given in Christ's "Index" [This is a slip for Christensen's "Index Filicum"]. A very careful study of the anatomy and life-history, comparison, and phyletic arrangement is given. Then come the Marattiaceae, a still living family, then the Osmundaceae numbering 17 species, and next the Schizaeaceae, with 4 living genera and 118 species which are not represented in Britain. Marsiliaceae with 3 genera and 63 species, of which *Pilularia* is our British representative, follow. Gleicheniaceae, with 80 living species, is then similarly treated, followed by the tropical Matoniaceae with 3 existing species which complete the Simplices, of which a General Review is given in his usually masterly manner. The Hymenophyllaceae follow, each of its two genera being represented in Britain. *Hymenophyllum* has 231 and *Trichomanes* 228 species. The Loesomaceae, with two genera, are followed by Dicksoniaceae, the Plagiogyriaceae, Protocycathaceae, and the Cyatheaceae, from which Dicksonieae have been separated. These include the great tree-ferns, *Alsophila excelsa* and *Cyathea medullata*, which attain a height of 60 to 80 feet. To these succeed the Dipteridaceae and then there is given a general review of the Primitive Ferns with maps showing their distributions and a phyletic scheme for the more primitive Filicales. It is a volume worthy of its distinguished author and of the University Press by which it has been issued.

BRITISH ASSOCIATION. Report of meeting at Oxford. pp. 473, 1926. President of Section K., Prof. F. O. Bower. Address, pp. 230-245. Unilateral Inheritance in *Ranunculus auricomus*. Prof. J. Percival on *Aegilops* × Wheat Hybrids. Wild Emmer (*Triticum dicoccoides*), Emmer (*T. dicoccum*), Macaroni Wheat (*T. durum*), and Bread Wheat (*T. vulgare*) with *Aegilops ovata* have been obtained. The offspring were intermediate. Prof. Dame Helen Gwynne Vaughan, D.B.E., and Dr Heslop Harrison on a discussion on Sex-determination in Plants, etc. A botanical excursion was made to Swinford Bridge, and another, conducted by Dr G. Claridge Druce, to the Berkshire Chalk Downs, the Commons of Greenham and Crookham, and the Kennet water meadows.

These afforded an opportunity of seeing some of the most interesting plants of the district. Another, and a joint, excursion conducted by Dr Druce, was to Bagley Wood near Oxford. The botanical papers were chiefly on physiological Botany. Lord Clinton presided over the Sub-section, Forestry. There was a large audience when Prof. J. W. Bews lectured on the Ecological Evolution of Angiospermous Woody Plants. The attendance at the Association was large and the address of the President, H.R.H. the Prince of Wales, which was given in the Sheldonian, was broadcasted through Britain as well as to the Town Hall and the Union Society's Hall.

BRITTON, N. LORD. Studies of West Indian Plants. 21 undescribed species from Cuba, 11 from Trinidad, and 1 from Porto Rico are noted. *Metastelma Freemani* N.E.Br. is from Balandra Bay, Trinidad.

BROWNE, Lady ISABEL M. P. Note on *Calamostachys tuberculata*, in New Phyt. 24, 305, 1925.

CALIFORNIA, UNIVERSITY OF. Publications, Vol. 13, Nos. 7, 8, 9, 10. In addition to those mentioned under the authors' names W. A. Setchell gives a Biography of T. S. and Mary Katherine Brandegee, notes on *Microdictyon*, and very able phytogeographical notes on Tahiti.

CAMBRIDGE. Delectus Seminum ex horto Cantabrigiensis Academiae. pp. 15, December 1926.

CAMPBELL, DOUGLAS HOUGHTON. AN OUTLINE OF PLANT GEOGRAPHY. pp. ix., 392. Macmillan & Co., London, 1926; 17/-. Even to those fortunate individuals who possess Drude's "Vegetation of the World" or Warming's "Oecology of Plants" this delightful volume from the pen of an American professor will be warmly welcomed. It is most clearly printed and profusely illustrated, and is produced with the excellency characteristic of the well-known publishers. Naturally stress is laid upon the American areas, but the author really gives a most able and comprehensive survey of the vegetation of the world and of its history. He frankly states that our knowledge of the vegetation of the earliest geological periods is almost nil. What evolves is that the earth's climate was formerly much more uniform than it is at present or how could magnolias, figs, walnuts and sequoias have been able to live in the latitude of Spitzbergen and Greenland as they did in the Eocene. This too was eminently true of the Carboniferous era when identical assemblies of plants were widespread over Western Europe, Central and Eastern Asia, South Africa, Eastern North America, and probably South America. Similar groups of floras were even more widely spread in Jurassic times and were known to range from Franz Josef Land, 82° N. to Graham Land, 63° S., the climate then being sub-tropical with heavy rainfall. But the reader is warned not to assume because tropical genera in a fossil state may be found, that a tropical or sub-tropical climate necessarily existed. He thinks we may assume that the an-

cesters of existing vegetation were very simple fresh-water algae. Even in the early Devonian formations the land plants have already attained a structure which implies a long series of intermediate forms between them and the ancestral algae. Then through the Cretaceous and Pliocene came a cooling-down which culminated in the great glaciation which has had so powerful an influence upon plant distribution, many species being frozen out, as for example, the magnolias and hickories in Europe, and thus Pleistocene glaciation was the greatest factor in the establishment of the temperate floras of the present day. The author goes on to discuss the existing factors in plant distribution, the subject of man and the plant world receiving adequate attention. Climatic Zones give the occasion for a luminous explanation and for introducing some excellent illustrations. The description of the North Temperate Zone is very readable, and brief allusions are made to the typical floras. Our British flora is rather summarily dismissed in a single page "but it can hardly be described as rich." The Mediteranean flora naturally requires greater space. There are pleasant photographs of Olives, Carobs, and Hollies in Majorca, of the Atlas Cedars and Date Palms in Algeria, of the wondrous view of Tree-ferns at Darjiling with the showy Kinchinjinga in the background, the gorge on the Yangtse river, the temple groves at Nikko; the American Elm on the Unadilla River, New York; a Cypress swamp in Florida, an alluvial swamp in Alabama, the forest of the Glacial Park, the desert vegetation of Mati, the Erythronium on Mount Ranier, the Redwood forest of Humboldt country in California, the Desert Mountain forest and Cactus of Arizona. These give some idea of the variation and of the beauty of vegetation. The Palaeotropics are also detailed with great fidelity, and we have views of the Baobab in Mombasa, the extraordinary *Welwitschia mirabilis* in Swakopmund, the rain forest of the Victoria Falls, the Banyan in the Botanical Garden at Calcutta, the Bamboos and Talipot Palm at Peradeniya, the Toddy Palm (*Borussa*) at Rangoon, the Rattan and Banyans at Buitenzorg, Java, the rain-forest in Sumatra, the edge of the Forest Mt. Salak, Java, the Alexandra Palm and Cedreae Toona (Cedar) in North Queensland, the forest and lake of Samoa, the magnificent gorge with *Aleurites* and *Gunnera* and the Tree-fern swamp in Hawaii. The Neo-tropical Regions include Mexico with views of its epiphytes (chiefly Bromeliads), the remarkable Sonoran desert vegetation in Western Mexico with *Idria columnaris*, the Tree Cactus of Libertad. South America is represented by views of a Brazilian tropical forest, the riparian forest in Surinam, the Groogroo Palm and jungle of Trinidad with the grand silk-cotton trees on the Savannah there, and the tree ferns and forest of the Jamaican Blue Mountains. What a vista they open out. In the South Temperate Zone as in South Africa there are views of the Karroo vegetation, which includes the Aloes on the Kopje near Beaufort West, the *Mesembryanthemum*, the aborescent *Euphorbia* near Durban, and the xerophytic vegetation near Ladysmith and the High Veldt of the Transvaal. Australia is illustrated by the splendid Bunya Pine (*Araucaria Bidwellii*), the Eucalyptus forest in Victoria, the coastal

vegetation of Perth, the curious grass-trees (*Xanthorrhoea*) and coastal scenes of West Australia; New Zealand by a Kauri (*Agathis*) forest, Cordyline, Todea and Tree Ferns. The Tussock grass land of the South Island, the Giant Moss, *Dawsonia*, and the sub-alpine shrubs of that island are also shown, and there is a delightful picture of *Gentiana corymbifera* growing on a hill-side at 4500 feet. Then come the Argentine Pampas, the *Libocedrus* and Beech Woods of Chile, and a meadow-land of Patagonia. One may turn to any page and always find some note of interest or reference to some striking feature of plant occurrence. Would that one could ride on the magic carpet to see *in situ* what has been so vividly put before the reader in this volume.

CANE, PERCY S. MODERN GARDENS. Edited by Geoffrey Holme and Shirley B. Wainwright. Special Winter Number of the Studio, 1923-7, pp. 24, with 166 pages of illustrations, eight being in colour. This charming volume, with such excellent illustrations of delightful gardens, will be a welcome gift to any recipient. The introduction gives much instruction in small space, the advice being practical and such as not to involve unnecessary expense. Necessarily such gardens as that at Westonbirt, of which illustrations are given, or the wonderful tour de force of Mr Hanbury's at Brockhurst, which is delightfully portrayed, are only available by the very rich, but there are many beautiful examples shown which are within the reach of a large number of horticulturists, and their formation would be a welcome relief from the many dull gardens which still exist. The examples shown, however, are not confined to Britain. There are some very pleasing pictures from America, France, Germany, Austria, Italy, Sweden, Denmark and Japan. The book is replete with delightful representations of these garden scenes, and their reproduction has been very skilfully carried out. The coloured views of the Brockhurst garden and that at Pangbourne are entrancing.

CHAMBERLAIN, CH. J. Two new species of *Zamia*—*Z. monticola* and *Z. sylvatica* from Mexico in *Bot. Gazette* 218, 1926. Hybrids in Cycads, *Z. latifoliolata* × *pumila*, *l.c.* 410, 1926.

CLUSIUS. DE L'ESCLUSE. The four hundredth anniversary of his birth was celebrated on October 19th at the Pieterkirk at Leyden when Dr de Luit placed a wreath of flowers and pronounced the orison. De L'Escluse is said to have produced the first garden tulip. He visited England and recorded *Calluna vulgaris* and *Erica cinerea* from near Windsor.

CLARKE, J., MARGARY, IVAN D., and MARSHALL, RICHARD. Report of the Phenological Observation in the British Isles, December 1923 to November 1924. *Quart. Journ. of the Royal Meteorological Soc.* Vol. v., n. 216, October 1925. The Notes on Trees and Shrubs (Tab. 8, p. 331) were made at St Michael's, Tenbury, Worcestershire, by Frederick on 90 species. The first day of the Elm flowering was—for *U. montana*

the 88th, for *campestris* the 79th, for *suberosa* the 97th, and for *stricta* the 102nd. Owing to the uncertainty of the Elm nomenclature we are uncertain what "*campestris*" and "*suberosa*" really mean. Most English authors consider them synonymous (See *Camb. Brit. Fl.* ii., 94), but here there is a greater divergence in flowering, *i.e.*, 18 days, than there is between *montana* and "*campestris*" and *montana* and *stricta*. In *Camb. Brit. Fl.*, *campestris*—the English Elm, and *montana* are said to open their flowers in February or early March, *i.e.*, the 66th day. The year must have been abnormal, for the average of ten years given for the first flowering of *campestris* is the 54th. Apparently it is the latest Elm to ripen its fruits—the 132nd day against the other species, for which the 125th day is given. There is a discrepancy between these results and those given in the *Camb. Brit. Fl.*, which needs elucidating, and especially the correct identification of *suberosa*. I have records of flowers appearing on the Wych Elm in January and on the English Elm in February.

COLLINS, S. HOARE, M.Sc., and REDINGTON, GEORGE, M.Sc. PLANT PRODUCTS. Edition ii., pp. xiii., 262. Baillière, Tindall & Cox, London, 1926. As Mr Collins said in his preface to the first edition in 1918, the raw materials of agriculture are often the waste products of other industries, and the produce of agriculture again forms the raw material for other industries. In these pages an attempt is made "to pick up the story of those industrial waste products which are useful as fertilisers and carry it on through the soil and crops, until new products are available for industrial use. Among the many plant products which are obtained from the soil, food takes a high position as an industrial raw product since neither men nor horses could work without it." Starting with "The sun as the source of power" to obtain plant products—(1) radiation from the sun, (2) a water supply, (3) a supply of air, (4) fertilisers, and (5) correct condition of heat, chemical reaction, and bacterial development are needed, and these factors are well explained in the chapters treating of fertilisers. Among these sulphate of ammonia, which is now being extensively prepared in synthetic factories, is shown to increase the yield of wheat and other agricultural produce. Potatoes have an increased yield, due to the use of a cwt. of sulphate of ammonia costing 14/-, of £3, or £2 6/- profit per acre. Other fertilisers are mentioned. These include Wool-waste, Feather-waste, &c. Their use has led to the occurrence of a large number of alien plants in the fields dressed with shoddy waste near Byfleet and Pyrford in Surrey. These belong to the Nitrogenous series, but much help is given by the Phosphorus group—Basic Slag—which may contain as much as 40% of tricalcium phosphate with about 40% of lime. The influence of this on sour soils is very marked, and clover springs up in the tract where it has been used in a magical manner. The mineral phosphates include coprolites, which formerly were obtained in some quantity from Bedfordshire. Now a considerable supply comes from Florida. Coprolite contains about 75 to 80% of tricalcium phosphate. There are also the arti-

ficial super-phosphates, bone manure, and guano. The last is not only phosphatic but of a nitrogenous character. Then come the Potassium series, of which wood-ash may be taken as a type. That from Beech may contain as much as 16% of potash, Larch yielding 15%, and Oak 10%. In practice, it is farmyard manure which forms the most ready source of supply. The diminution of the number of horses kept in England explains the scarcity of Mushrooms, and ere long we shall have, in the main, to depend upon their artificial culture. But this is a diversion. Farmyard manures are of a complex nature. They are full of bacterial life. A micrococcus assists in reducing urea into ammonia carbonate, and by a series of very complex actions this is converted into many curious compounds. Very interesting details and useful advice are given on this subject and also on the treatment of sewage. Part II. is devoted to The Soil, and here is an immense amount of information of the highest value. The use of electricity in plant stimulation is not overlooked. As I once journeyed from Niagara to Toronto with the overhead electric wires along the tract, carrying the voltage from the generating station at the Falls to the city, one could not but notice the luxuriance of the grasses. One had to look twice at *Poa pratensis* or *trivialis* to be sure that they were correctly identified. Whether this luxuriance was due to the soil or to the wastage of volt-power is a question to be solved. A section is devoted to Photosynthesis and another to the Carbohydrates produced in crops, such as sugar, starch, and cereals. Of oil-bearing plants—Linseed, Cotton, Soya Bean, Coco-nuts, Rapeseed, and Castor Oil are treated. There is a chapter on miscellaneous plant products. These embrace Tea, Coffee, Cocoa, Tannin, Rubber, Tobacco, Indigo and Fruit. The final sections are devoted to Manuring Grass for Meat Production, the Foods fed to Beasts, and the Calorific Value of Foods. This volume, which is one of the Industrial Chemistry Series, is of real practical use and contains a large amount of valuable material. It deserves a wide circulation.

CONQUEST. A Monthly Magazine of Progress, Invention, and Discovery. Edited by T. Barton Kelly. Vol. vii., 1926. Yearly, 14/- post free. The March number contains an account of "The most remarkable plant I ever saw." Capt. Kingdon Ward, the distinguished and intrepid traveller in China and Burmah, chooses a *Rumex* eight feet high, of which hundreds grew together, visible a mile away like yellow candle flames against the dark moor. It grew at an altitude of 15,000 feet. Dr D. Thoday figures the Mangrove, *Brugiera gymnorrhiza*, in the mud of Salisbury Island, near Durban. Mr Alex. Hill mentions *Eucalyptus marginata*, the roots of which had penetrated through a cave till they had reached 120 feet below the earth's surface. Prof. Weiss figures an extraordinary Euphorbia—*multiceps*, from the Karroo Desert. Dr Dukinfield Scott considers the fossil *Asteroxylon* as the most remarkable from its age, it being among the oldest plants of which the structure is known. Although it is like the Lycopods, Psilotaceae and Ferns, it is distinct from each and unites in itself three genera, each at

one time supposed to be distinct. Dr Rendle chooses the Climbing Sundew of Australia. On the British Association Meeting there we saw some beautiful examples of the Rainbow Plant, as it is called. The clear viscid drops of secretion on the leaves break up the sunlight so that miniature rainbows are seen in the shrubs up which it climbs. Prof. Yapp instanced the great Malayan Fern, *Lecanopteris carnosum*. In the mass of branches colonies of ants form a complicated system of galleries. *Epipogon* was chosen by the writer as the most remarkable British Plant. Prof. Maughan shows a remarkable fasciation of the stem of *Ranunculus sceleratus*, which was ten inches wide and bore hundreds of flowers. It came from the banks of the Itchen at Bitterne, S. Hants.

CURTIS'S BOTANICAL MAGAZINE. Edited by O. Stapf, Ph.D., F.R.S., published for the Royal Horticultural Society by B. Quaritch, London. Annual subscription, 63/- net. This volume is dedicated to that eminent horticulturist, Mr E. A. Bowles. We congratulate W. E. Trevithick and L. Snelling on their excellent drawings. Plate 9088 is of *Aconitum anglicum* Stapf who describes it as a species distinct from *A. Napellus*.

DANSER, B. H. *Lamium hybridum* Vill. and *Lamium intermedium* Fr. ? Hybrids. Nederl. Kruid. Arch. Jaarg 407-413, 1925. Beitrag zur Kenntnis der Gattung Rumex. Nederl. Kruid. Arch. Jaarg 414, 1925. This includes notices of *R. salicifolius* with new sub-sps. *triangulivalvis* and *angustivalvis* with figures. The *salicifolius* of Britton & Brown is *triangulivalvis*. A variety of it, *nudivalvis*, is in the Edinburgh Botanic Gardens as *R. pauciflorus* Nutt. An account of *R. obtusifolius* and its varieties is given. The suggestion that priority of place means the replacement of *R. maritimus* by the name *R. persicarioides* L. is dealt with. Under *R. obovatus* Danser the British localities of Bristol (*Sandwith*), Hull (*Miss Cobbe*), and Glasgow (*Grierson*) are cited. *R. paraguayensis* Parodi has been found in Holland and Germany, and a hybrid of it with *maritimus* (*Jansenii*) is described. Others noted are *discriminans* (*obovatus* × *paraguayensis*), *Wachterianus* (*dentatus* × *paraguayensis*), *Goethartii* (*paraguayensis* × *salicifolius*), *Bontei* (*crispus* × *obovatus*), *adscendens* (*dumosus* × *salicifolius*) and *leptophyllus* (*fennicus* × *obtusifolius*). Prof. Danser has been at Buitenzorg, Java, for the greater part of the year.

DARNELL, A. W. WINTER BLOSSOMS FROM THE OUTDOOR GARDEN. A descriptive list of Exotic Trees, Shrubs and Herbaceous Plants that flower in the outdoor garden in the British Isles during the months of December, January and February. For the use of amateur gardeners. Alphabetically arranged. pp. xxiv., 335, 1926. L. Reeve & Co., London; 21/-. 24 plates, 8 of which are coloured. The Foreword is usefully devoted to the Propagation of Hardy Winter Flowering Plants, and some valuable advice is given on this subject. The nomenclature of the *Index*

*Kewensis* has been chosen, as it is "the one most frequently used in this country." He says "the rule of priority in generic and specific names is being rigidly enforced," but he does not seem to know of what are called "nomina conservanda" or the unwise attempt to increase the exceptions to that rule. The author believes the synonyms he cites are fairly complete, and he wisely follows the pre-war political divisions on the ground of its being more easy to locate the habitat of a species than if an atlas based on the decisions of the Treaty of Paris had been adopted. Three species of *Acacia* are given, *A. Baileyana* being figured; two species of *Adonis*, one the popular *A. verna*; two species of *Akebia*; *Alnus oregonia* and five Anemones. *A. apennina* is said to be naturalised fairly plentifully in Surrey, Beds, Berks, &c., a statement which hardly holds true of Berks. It might have been added that Middlesex has it very locally at Ken Wood. *A. vernalis* is well figured and *Arbutus Unedo* and *Andrachne* are described but the latter species grows also in Greece where it hybridises with *Unedo*. Among others, two species of *Buddleia* are mentioned, *B. crispa* being quite as hardy as *globosa*. *Cerastostigma Willmottianum*, which commemorates one of the best horticulturists, and the sweet-scented *Chimonanthes* are not forgotten. The very attractive *Chionodoxa* deservedly finds a place. The gorgeous *Clianthus puniceus* may be grown in the open in the south-west counties. Nine species of *Colchicum* are given, and eight species of *Corydalis* find a place (the oldest generic name, *Capnoides*, being tabooed by the Englerites). An account of the Glastonbury Thorn is given. Forty-eight species of *Crocus* are mentioned. To see them in their beauty and variety one ought to make friends with Mr Bowles and see them in his Middlesex garden. One wishes that Mr Darnell had placed the authors' names after the species. Eight Cyclamens help to swell the number, and what attractive plants they are! *Pyrus* (or *Cydonia* as it is here called) *japonica* is honoured with a good coloured plate. *Daphne Mezereum* has its meed of deserved praise. There are six Heaths, three Forsythias, and seven Snowdrops with a figure of *G. Elwesii*. The author considers *nivalis* to be native in Devon, Gloucester, and Warwick, but the evidence in its favour does not appear conclusive. Twelve Gentians are alluded to, also the Umbellifer, *Haquetia*. There are four species of *Hamamelis* and twelve Hellebores, of course including the splendid *H. corsicus*. The thirteen species of *Iris* include *I. Danfordiae*, described by Boissier for Cilicia. The striking *Kniphofia aloides* is strongly recommended as is *Lapageria rosea*. What a sight this plant is on a southern wall in Cornwall! *Leucojum vernum* (to which might be added *pulchellum*), the two blue species of *Lithospermum*, three Magnolias, seven Daffodils, two species of *Picris*, *Polygala Chamaebuxus*, ten Primulas, eleven species of *Prunus*, four Lungworts, seventeen species of *Rhododendron*, two *Ribes*, fifteen Saxifrages, five Squills, the attractive *Sternbergia lutea*, five Tulips (one of them has a misprint from which the book is commendably free), three species of *Viburnum*, three Violets and *Zephyranthes versicolor* are among the plants which make up a wonderful winter garland, on the account of which we may warmly congratulate

the author. Doubtless the book will come as a welcome gift to many a flower-lover in the dull winter time.

DAVY, JOSEPH BURTT, Ph.D. Handbook of Conifers grown in the Arboretum, Bagley Wood, Oxford. pp. 45. Holywell Press, Oxford. Issued by the Department of Forestry, University of Oxford. The whole collection numbers 122 species and varieties. No capitals are used for the specific names. The Laws of Nomenclature are not invariably followed, nor is the Law of Priority. For example, *Larix europea* is employed instead of *L. decidua*, but *Larix Larix* would have cut the Gordian Knot. The Catalogue is well printed, and there is some very useful information given under each species. A map on a scale of thirty feet to an inch is given. Incidentally the planting of that area in Bagley has destroyed several interesting native species.

DAVY, JOSEPH BURTT, Ph.D. A Manual of Flowering Plants and Ferns of the Transvaal with Swaziland, South Africa. With illustrations by W. E. Trevithick and Alice Bollon Davy. Part I. Pteridophyta to Bombaceae. pp. 272. Longmans, Green & Co., London, 1926; 15/-. Warm congratulations are offered to Dr Burt Davy for the production of this very compact instalment of the Flora of a portion of South Africa which offers many points of special interest. In his preface the author alludes to the five years of unremunerative labour which it has involved. This emphasises the difficulties under which systematists at the present day labour. The demand for the publication is small, since there is no large number of people who care for this. In past centuries much help was given by the aristocracy and the clerical profession. In this way great works such as Morison's "Plantarum" and Plot's "Historias" were produced—but recently the classes in question have to retrench, and the easiest thing to retrench in is literary luxuries. To give up mustard in Lent calls for no great sacrifice. The new-rich rarely have the sense of responsibility or the wish to encourage science for its own sake. Even such a small thing as a yearly subscription to our Society, which does not represent the price of a theatre stall, is thought to be a thing one can easily do without. So one can very fully sympathise with Dr Burt Davy in the not unnatural grumble he makes. However, the reader of this very compact book, which being printed on thin paper will, when completed, be easily carried in the pocket, will have no cause to grumble even though the price is necessarily high since it deals in a very thorough manner with the flora of a most interesting country. The area involved is only very slightly less than that of the British Isles—117,128 against 121,633 square miles. He divides it for botanical purposes into five provinces. It contains about 4500 species, double that of the British Isles. The sequence (and this is the only point in which one differs from the author) is not that of Bentham and Hooker. It would seem to have been better to follow the arrangement at the Kew herbarium and that of the already published colonial floras. In saying this one recognises that the natural sequence is at present in the melt-

ing pot. There is a very useful introductory chapter with excellent hints on plant collecting, and a copious glossary of 22 pages. A description of the new species and varieties, which number 131, is also included in a separate chapter. The arrangement, of which we have already spoken, begins with the Filicales, of which 146 are included. There are 11 Gymnosperms, and 780 Angiosperms, a total of 937, of which 102 are alien. These are comprised in 224 genera. Useful analytical keys to the groups and families are given. These occupy 16 pages. For the Ferns Engler's sequence in the "Syllabus" is followed. We are glad to see *Dryopteris* is used instead of *Lastrea*, &c. *Pteridium* is employed but it has been recently shown that Newman's *Eupteris* is the more correct name. Then directly following the Equisetaceae comes Ranunculaceae of which only four Buttercups appear to grow in the area. *Drouetii* is the only British one mentioned. *Nasturtium* is used, and in that has official sanction, but *Radicula* is unmistakably the older name. Gardeners still use *Nasturtium* for the *Tropaeolum*, the latter a Linnean invention which early excited opposition. We notice that there are 22 species of *Polygala*, not one of them British. *Agrostemma* is kept up. The family name Ficoidaceae, following N. E. Brown, is used. Others prefer Aizoaceae. It seems extraordinary to find Polygonaceae following so closely in the wake. One is tempted to ask what is *tomentosum* Willd.? It is satisfactory to find that the correct dates for *Rumex conglomeratus* 1770 and *glomeratus* 1771 are given. They were misquoted in "The Cambridge British Flora." The Index is to the Families only. Parts II. and III. (to be issued) will complete the Dicotyledons, and Part IV. the Monocotyledons. The latter will have a general index to the four parts. We anxiously await the completion of this important contribution to the flora of the Transvaal, and we are sure that it will be warmly welcomed by South African botanists. Its merits will soon be recognised by a much wider circle, and we trust it will sell in sufficient numbers to avoid a serious pecuniary loss falling upon its industrious author.

DEVONSHIRE. Seventeenth Botany Report, by Miss C. E. Larter. Trans. Dev. Ass., Vol. lvii., 75-89, 1925. Includes *Geranium nodosum* and *Fragaria moschata* from E. Buckland, several varieties of *Rosa systyla* and other interesting forms including a nov. var. of *R. dumetorum* = var. *Saveryi* Wolley-Dod. *Pinguicula vulgaris* appeared at Ilington in 1925. It is greatly to be hoped that some one will be found who will complete a flora of this large and interesting county.

DRUCE, G. CLARIDGE. THE FLORA OF BUCKINGHAMSHIRE. pp. cxxviii., 437. T. Buncle & Co., Arbroath, 1926; 25/-. The reviewer's task is by no means an enviable one, in any case. If he avoids the Charybdis of fulsome flattery on the one hand, he may be wrecked on the Scylla of hyper-criticism on the other hand, and vice versa. In the present instance, however, he fears that even should he steer clear of both these dangers, he may yet listen to the "call of the wild," deviate from his intended course of reviewing a book, and run aground in attempting to

revel in its Botany! Before attempting to deal with the text, I cannot refrain from congratulating the publishers on the excellent manner in which it is presented. The clearness, delicacy and beauty of the type are so admirably correlated with almost ideal spacing, arrangement, and wide margins, that to read the book is a sheer delight. Diligent search only succeeded in discovering one error in pagination (lxxvli.), and that appealed more to my sense of humour—most saving grace—than to that of criticism. Turning to the text, I was at once impressed by the monumental character of the work accomplished by Dr Druce, in completing this third volume of the Flora of the Upper Thames. The laborious nature of the work involved in collecting, verifying and arranging such an enormous mass of data, will at once be recognised by every reader of this charming work. We are lost in wonder at the author's indomitable energy, amazing versatility, and profound scientific acumen—especially when we remember his extensive commitments in other directions. In compiling the Flora of Buckinghamshire, Dr Druce has avoided two of the most common faults found in some existing floras. The volume is not a mere list of plant species, nor does it include any of the vacuous verbiage which disfigures some previous works, and has prevented the publication of at least one otherwise valuable modern flora. In a county so rich in historical associations as Buckinghamshire we expect some reference to these, in any account of its vegetation, and Dr Druce is particularly happy, both as to the character and the extent, of his historical allusions. The Introduction is admirably conceived and very concisely and clearly expressed. The Geology of the county receives excellent and adequate treatment, while the various drainage systems into which the county is divided are clearly defined and separately described in a delightfully picturesque manner. Particularly interesting and informative—in the writer's view—is the large amount of valuable ecological observation which permeates the whole of the Introduction. If all British systematists would recognise that, apart from correlation with ecology, their work is relatively of little value, we should make a much greater, and far more valuable contribution to the sum of human knowledge. Incidentally, the absence of Saltmarsh, Sand Dune, Seashore, Mountain, Sub-alpine Moor, Peat-bog and Lake from the county, naturally limits the list of species, and is at once noticed by the botanist to whom these delectable habitats are "household words." More to the point, however, is the omission of any special reference to Rainfall, Sunshine, prevalent Winds and all that is embraced in the term Climatology. This, of course, may be obtained from other sources, but for future and comparative reference would have been an added attraction to the work under notice. With regard to the omission of the Bryophyta, Lichenes, Fungi, and Fresh-water Algae, I am in entire agreement with the author. Any attempt to deal adequately with these would have indefinitely delayed the publication of the volume and doubled its cost of production. In my own judgment they should not in any case be included unless each is in the hands of an acknowledged authority, and these are few in number. Not every county possesses a West, a Wheldon,

a Wilson, or a Watson! This review is necessarily brief, as I am inordinately busy in other directions, but I felt that it would be unpardonable for the Members of the Society to allow the current *Report* to be issued without some special reference to so outstanding an achievement as that of Dr Druce in completing a third county flora of such exceptional excellence. While I may have succeeded to some extent in avoiding prolixity and hyper-criticism in this short review, I am conscious that in my unfortunate choice of language, I have quite failed to adequately express my high appreciation of the work before me.—W. H. PEARSALL.

DRUCE, G. CLARIDGE. The Botany of the Upper Thames in "The Natural History of the Oxford District." Edited by J. J. Walker. pp. 336. Prepared for the Members of the British Association of which Dr Druce was a Vice-President. Oxford University Press, 1926. Botany, pp. 72-127. In this book the author has given the most prominent features of the Botany of the Upper Thames and has prepared an estimate of the flora of the three counties of which it consists, viz., Natives, 997; Denizens, 52; Colonists, 79; and Aliens, 426 species, a total of 1554, besides about 600 varieties and 100 hybrids. The list of the rarer species includes *Ajuga genevensis* and *Stachys germanica* in practically their only British habitats (the former is alien in Cornwall), *Campanula persicifolia*, *Potamogeton Drucei*, *Apium repens*, *Epipogon*, *Orchis Simia*, *Danaea cornubiensis*, *Carum Bulbocastanum*, *Muscari* and *Althaea hirsuta*, *Aconitum anglicum*, *Thlaspi perfoliatum*, *Iberis amara*, *Viola stagnina*, *V. lactea*, *V. epipsila*, *Silene conica*, *Cerastium pumilum*, *Elatine hexandra*, *E. Hydro Piper*, *Hypericum Desetangii*, *Epilobium Lamyi*, *Hieracium surrejanum*, *H. praealtum*, *Sonchus palustris*, *Campanula patula*, *Gentiana germanica*, *G. praecox*, *Nymphoides*, *Cynoglossum montanum*, *Salvia pratensis*, *Prunella laciniata*, *Teucrium Scordium*, *Illecebrum*, *Asarum*, *Aristolochia*, *Daphne Mezereum*, *Ulmus Plotii*, *Stratiotes*, *Orchis hircina*, *O. militaris*, *Herminium*, *Crocus albiflorus*, *Lilium Martagon*, *Damasonium*, *Carex elongata*, *C. paradoxa*, *C. tomentosa*, *C. montana*, *Ornithogalum pyrenaicum*, *Apera interrupta*, *Poa irrigata*, *Festuca heterophylla*, and *Bromus interruptus* also occur. The author groups his remarks under heads (1) the Aquatic or Lacustral species and their homes; (2) the Paludals; (3) the Pascuals; (4) the Rupestrals (very poorly represented); (5) the Sylvestrals, whose abundance is an evidence of the woodland areas that once existed and are still fairly well represented; (6) the Agrestals; and (7) the Adventives. A slight sketch of Botany in Oxford since the foundation of the Botanic Gardens in 1621 by Henry Danvers and of the Herbarium, as well as a Bibliography, are supplied. The Handbook was so much appreciated by the Members of the British Association, especially Section K, that the Clarendon Press have now issued it for the general public.

DRUCE, G. CLARIDGE. THE VICTORIA COUNTY HISTORY OF HUNTINGDONSHIRE. Edited by W. Page & Granville Proby, M.A. Part II. Botany, by G. Claridge Druce. pp. 29-80, 1926. The St Catherine Press,

Stamford Street, Waterloo, S.E. The Botany separates, 10/- each. In this compact treatment of the Botany of the small county of Huntingdon Dr Druce has endeavoured to show the salient features and to give the localities of the plants recorded for the county. It is not half as large as Northants or Cambridgeshire. The number of species, so far as at present ascertained, are:—

	Northants.	Cambridge.	Bedford.	Huntingdon.
Acreage, .....	641,992	549,723	298,494	234,218
Native Species, .....	892	892	763	757
Denizens and Colonists, .....	85	85	85	133
Dubious, .....	(12)	...	...	(14)
	977	977	848	890

Northants has also 42 adventive species and Bedfordshire many which are not included in the above numbers, whereas Cambridge and Hunts are credited with all that have been reported. The standard of species in these county lists is not uniform. A large number in the Cambridge list are extinct species. Bearing this in mind there is no doubt that Cambridge has not only more rare and interesting species but the larger flora, in part due to the presence of the Chalk. The river drainage of Huntingdon is wholly in the Ouse basin, but the county is divided for botanical purposes into the Nene and the Ouse districts. The geology and Fenland are shortly described, and of the latter a vivid picture of the old fenland is given before drainage had converted so much of it into rich arable land. A botanical history of the county is given beginning with John Ray and sketches of the lives of the Rev. Miles J. Berkeley, Rev. W. W. Newbould, Canon Paley, and Alfred Fryer are given. To the last-mentioned the county is specially indebted for his study of the fenland flora to which he added many species. In later times the Revs. E. F. and W. R. Linton added some species, and Mr Edward W. Hunnybun drew many of its plants for the unfinished "Cambridge Flora." The Marchioness of Huntly also painted many of its plants when she lived at Orton Longueville, where her herbarium is still preserved. A detailed comparison of the ingredients of the four counties mentioned is given, and then follows a list of its species with localities. The county has *Juncoides pallescens*, a plant practically confined to it, and other rarities include *Viola montana*, *V. stagnina* and many hybrids, *Melampyrum cristatum*, *Euphorbia Lathyrus* (native), *Trifolium ochroleucum*, *Potamogeton fruitans*, *P. Billupsii*, *P. varians*, *P. falcatus*, *P. coriaceus*, *P. involutus*, *P. decipiens*, *P. panormitanus*, *P. trichoides*, *Narciscus*, *Myrica Gale*, *Calamagrostis canescens*, *Gastridium*, *Nitella flexilis*, var. *Fryeri*, *Tolypella intricata*, &c. This is the first time in which the Botany of the County has been treated as a whole. Much still remains to be done in working out the distribution of the various plants. The author's own investigations started in 1874, and he has been enabled to make many additions to its flora.

DUNCAN, J. B. A Census Catalogue of British Mosses. 2nd Edition. pp. 66, 1926. Martin's Printing Works, Ltd., Berwick-on-Tweed; 2/-; 2/6 Interleaved, of W. R. Sherrin, A.L.S., South London Botanical Institute, 323 Norwood Road, London, S.E.24. Arranged according to Dixon & Jameson's "Student's Handbook of British Mosses," 1924. 622 species, included in 115 genera, are dealt with in a neatly printed and carefully compiled Catalogue in which colour forms, forms and sub-forms are wisely omitted.

ELLISTON-WRIGHT, F. R. Braunton: a few Nature Notes with Lists of the Flora, Macro-Lepidoptera and Birds known to occur in the District. A. Barnes, Barnstaple, 1926. This forms a very pleasing description of a rich and charming country, cheerfully written and brightened with many well drawn figures. It will form a useful pocket companion for those nature-lovers who may explore that rich area. There are precise descriptions of the Sands and of the plants which occur there. As he says, the Bog Pimpernel produces sheets of colour which may be seen at a distance. A clear description of one of Braunton's treasures, *Teucrium Scordium* L., is given, as well as figures showing the early and later flowers. The author says of its clothing of downy hairs that they form a great protection for loss of moisture. The Latin names are not always the same in the text and in the more detailed list—*Chlora* is used in one and *Blackstonia* in the other. We are sorry to see the untenable *Erythraea* is chosen. The pollination of *Helieborine palustris* (*Epipactis*) is well illustrated and, of course, there is a figure of *Scirpus Holoschoenus*. There is a map given on the scale of 1 mile to the inch.

FIORI, ADRIANO. NUOVA FLORA ANALITICA D'ITALIA. Vol. i., pp. 944, tt. 12, 1923-5. This, following Engler, contains the Filices, Coniferae, &c., as far as the Leguminiferous genus, *Vigna*. The Male Fern is (contrary to Christensen) made a *Polystichum*. *Arundo* is chosen for *Phragmites*. *Bromus unioloides* is called *Ceratochloa* and there are many other changes. Vol. ii., fasc. i., pp. 1-160, continues to the Malvaceae.

GARDENERS' CHRONICLE, 1926. 6d weekly. Capt. Kingdon Ward continues his article on his eighth expedition in Asia. His winter quarters in the high altitudes look anything but attractive. There were 50° of frost, and only yak dung for fuel at 15,000 feet elevation. His account is vivid and graphic and it is illustrated with excellent photographs. Mr N. E. Brown continues his exhaustive study of Mesembryanthemum, and he describes the numerous new genera which he has carved out of the Linnean genus. The Early History of the Potato, by T. P. M'Intosh. It is stated that the first mention of the Potato in literature is that given by Cicca in "Cronica de Peru," published in Seville in 1553. An account of the Rev. Hilderic Friend, with a portrait, is given on p. 57. He is the authority on British Annelids, but has written on Flowers and Flower Lore and a Glossary of Devonshire Plant

Names. At one time he lived close to the border of Oxfordshire whence he sent me a hybrid *Hypericum*. On p. 65 he contributes a series of well written papers on Classical and Legendary Gardens. Capt. Kingdon Ward, p. 252, describes the genus *Meconopsis*. The Botanic Gardens at Tjibodas, Java, are described and illustrated on p. 270. They are situated at an elevation of 4500 feet, and are about 60 miles from Buitenzorg. They have a large variety of tropical treasures and possess a fine natural waterfall. Native Plants as a Guide to Soil and Tree Planting, p. 382. The Conception of a Species, by G. C. Hurst, ii., p. 172. *Viola gracilis*, by Lieut.-Col. E. Todd. This was first found by Sibthorp on Mount Olympus. David Douglas, the great explorer of N.W. America. A delightful account is given of him, ii., p. 250, by Neville Cooper. Lilies in the United States. There is an illustration of a field of 10,000 *Lilium regale* at Greenbrae, Seattle. The British Herbal of 1743. There is a note on this rare work by S. Savage, ii., p. 270. Cintra, Montserrat, ii., p. 330. The Hill Cherry of Japan, *Prunus mutabilis*, ii., 331. *Quercus Cerris* L., seeding at Busbridge, Surrey, ii., p. 332. An Appreciation, with portraits, of Mr W. H. Stansfield, a prominent horticulturist, is given on p. 342. *Rubus nutkanus* in Alaska, with a good picture of a fine flowering bush, ii., p. 371. *Phormium tenax*, with figures, ii. p. 387. Twenty days in a Botanist's Paradise—the Klinghardt Mountains in Africa, by Prof. K. Kuitert, ii., pp. 431 and 452. Several important new species were discovered. Autumnal Colour, by H. E. Armstrong, F.R.S.

GENÈVE, BULLETIN SOC. BOTANIQUE DE. Editor: R. Chodat. Vol. xvii., pp. 390, tt. 187, 1925; 15 frs. Includes, among others, papers by G. Beauverd, on Comptes rendus des Séances; Polymorphism of *Nigritella nigra* and *Listera*. *Listera ovata*, var. or sub-sp. *eburneo-rosea*, f. *brachyglossa* Peterm., f. *platyglossa* Peterm., *lusus alternifolia*, *trifoliata*, var. *longifolia* Beauv. and *L. cordata*, var. *chlorantha* Beauv. are described with Key for the species of this genus. He also describes a new *Silene* from Le Lauteret, viz., *S. delphinensis*. R. Chodat & Miss K. Massey. Hybrids of *Sempervivum*, *Galium Mollugo* × *verum* with figures of leaf sections, *Medicago sativa* × *Falcata*, *Viola*, *Pedicularis*, *Dianthus* and *Colchicum*. M. N. Porta, On the possible hybridity of *Sedum sexangulare*—*S. acre* × *reflexum*. This awaits further research—and so far one feels reluctant to accept this conclusion which, as Prof. Chodat suggests, requires chromosome examination. H. Romieux & K. H. Zahn, *Hieracium* nouveaux de Suisse et de France. Calvert Wilson, Pollination of *Lilium Martagon* by Lepidoptera. R. Chodat & L. Relifont, La Végétation du Paraguay et Plantes Nouvelles ou peu connues de L'Entremont (Valais), with many illustrations. *Orchis Simia* × *Aceras anthropophora* = × *O. Bergoni* in France and Switzerland, with figure. Vol. xviii., fasc. i; 9 frs. G. Bonati, Madagascar Scrophulariaceae. 11 new species of *Ilysanthes*, 3 new *Radainae*, as well as *Leucosalpa Perrieri*, 2 species of *Halleria* and 3 new *Torenia*. G. Beauverd, Plants of Chambéry. F. Chodat, Recherches Expérimentales

sur la Mutation chez les Champignons. The son of the distinguished Botanist is to be highly congratulated on this able paper of over 100 pages. K. H. Zahn & H. Romieux, *Festuca Camuscana* St Y.

GILBERT WHITE FELLOWSHIP. Subscription, 7/6. Secretaries, Miss W. M. Dunton, 14 Albert Mansions, Battersea Park, S.W.11, and G. B. Fox, 45 Stanwick Mansions, W. Kensington, W.14. President, Sir Daniel Hall, K.C.B. Many excursions and meetings were held during the year.

HALL, SIR DANIEL. The Literature of the Country-side in the School. A paper read at a meeting of the Gilbert White Fellowship on November 1, 1924. Pamphlet No. 4, pp. 16, 1926.

HITCHCOCK, A. S. North American Species of *Stipa*. Contrib. U.S. Nat. Herb. 24. pp. 251-262, 1925. Describes 40 species, 5 of which are new. Synopsis of South American species of *Stipa*. *l.c.* 263-289, 1925. Describes 89 species, of which 19 are new.

HOLMAN, RICHARD M., & BRUBAKER, FLORENCE. On the Longevity of Pollen. Univ. California Publ. pp. 178-204, 1926. The pollen of the Primulaceae has the longest life. Then come the Leguminosae, Rosaceae and Saxifragaceae. In Graminaceae the pollen in either dry air or humid air lasts one day only. Hay fever victims will scarcely credit this. That of Salicaceae lives for 21 days. By artificial means the longevity of pollen of *Listera cordata* has been lengthened to 164 days, and that of *Typha latifolia* to almost a year. This was stored over fused calcium chloride.

HONDURAS, THE HANDBOOK OF. Comprising Historical, Statistical and General Information concerning the Colony. Compiled by Monrad Sigfrid Metzgen and Henry Edney Conrad Cain, under the Directorship of H.E. Sir Eyre Hutson, K.C.M.G. Published by the Crown Agency for the Colonies. pp. 461, with map, and 31 illustrations. London, 1925. There is an excellent Chronological Table. Honduras was discovered by Columbus on July 10, 1447. It is celebrated for its Logwood—*Haematoxylon campechianum*. Even as far back as 1671 Belize (a name now restricted to its capital) was a prosperous settlement. It was ceded to the British in 1670 by the Spanish. The colony has streams of great beauty, and its highest part, Victoria Peak, is over 3700 feet above sea level. There are a large number of islands. The vegetation is such as a tropical and sub-tropical area afford. The Breadfruit tree fruits in great luxuriance, and the native flora shows superb colouring. Epiphytal and terrestrial orchids are well represented. A large number of economic plants are cultivated. The evergreen rain forests have Mahogany (*Swietenia macrophylla*) which is the best in the world, and Ironwood (*Laplacea Haematoxylon*). The Grugru Palm occurs in the Broken Belts. Sapodilla, which gives employment to such a large number of our American cousins, as it affords "chewing gum," Castillea rubber, Cacao and

Vanilla are indigenous. The Honduras *Cedrus* and its wood are avoided by insects. Logwood, already alluded to, and Rose Wood (*Dalbergia latifolia*) are beautiful woods. The Calabash (*Calophyllum Calaba*) gives a good and durable timber, and its curious fruits have seeds yielding a good fixed oil. The woodlands are extensive and very varied. Silk-grass promises well for affording a strong silky fibre. This is an excellent handbook of a colony which is none too accessible.

HORTICULTURAL SOCIETY, THE JOURNAL OF THE ROYAL. Edited by F. J. Chittenden. Vol. 51, pl. 2, pp. 177-352. Vincent Square, Westminster, S.W.1. Annual Subscription, 7/6; Fellows, one guinea. Memoir of the late Secretary, William Rickatson Dykes, with portrait and an appreciation of his work on Irises by George Yeld, M.A., V.M.H. (see *Rep. B.E.C.* 846, 1925). An account of The New Hall, by J. Murray Easton, A.R.I.B.A., with illustrations. Taxaceae at Aldenham and Kew, by the Hon. Vivian Gibbs. Despite the popular belief that our soldiers were armed with Bows made from English Yew, he quotes Drayton's poem on the battle of Agincourt where the English Archers are described as "armed with Spanish Yew so strong," the Yew being imported from the Pyrenees. Even in Queen Elizabeth's time nearly 6/8 was the price paid for foreign Yew of the best sort as compared with 2/- for the coarser sort, that being English Yew. So another illusion is dispelled. Mr Gibbs does not for one moment connect the presence of the Yew in churchyards with any association of Druidical stones or altars. That their presence there is of very ancient date is evidenced by the Geraldus Cambrensis in 1184, which records they were very frequent in Irish cemeteries. He discusses the duration of life of the Yew and thinks that its longevity has been greatly exaggerated, but he believes it may last longer than the oak. Its use in topiary work is mentioned, and the well-known examples at Levens, Packwood House and Elvaston Castle are mentioned. He recommends its use in woodlands. The Yew is dioecious, but once in a way a female branch will be found on a male tree. He alludes to a very old tree in Buckland Churchyard which was moved for 80 yards in 1880 to admit of the enlargement of the church. It bore its removal well, although the tree was reported to be the one mentioned in Domesday Book. He alludes to the wonderful old Yews growing on Mickleham Downs near Leatherhead and also those at Kingley Vale near Goodwood. Some exceed 15 ft. 4 in. in girth and are possibly about 500 years old. There is an example of yew panelling at Batsford in Gloucestershire which was put up by the late Lord Redesdale. Many varieties are mentioned, including *Dovastoni* Carrière. Of this and of several others, figures are given. There is a very good one of *fastigiata*, of which the female plant only is known. The whole article is excellent and forms a most valuable article. G. Fox Wilson gives a contribution from the Wisley Laboratory on Pollination in Orchids with many beautiful illustrations. Major A. A. Smith Dorrien contributes a paper on Flower-growing for Market in the Isles of Scilly since the Great War. Mr C. Eley writes on Roadside Plant-

ing. Sir W. Lawrence, Bart., discusses Virtuosity in Vegetables, and a wide range is described. A schoolboy's illusion is shattered when we are told that Sir Walter Raleigh, who was believed to have introduced the potato, never visited Virginia. That country did not even grow the potato in the 16th century. Some little-known vegetables are descanted on by Mr E. Beckett. They include, among many others, *Aralia cordata* (when blanched the stems are said to have a delicate piny flavour), *Stachys tuberifera* or *Sieboldii*, the Aubergine, Bamboo Tips, Celeriac, the bulbous root Chervil, edible *Hibiscus* and *Oxalis tuberosa*. Genetics of the Wisley Blue Primrose by B. Buxton, and New Zealand Veronicas by H. W. Lawton are other readable articles. We are glad to see that Miss C. G. Trower has for the third time received the Grenfell Medal for her beautiful paintings of British plants.

HUME, HAROLD. THE CULTIVATION OF CITRUS FRUITS. pp. xx., 561, tt. 237, 1926. Macmillan & Co., Ltd., London; 21/-. This volume is one of the eminently valuable Rural Science Series which is edited by the great American authority on Horticulture, Dr L. H. Bailey. No one more qualified for the task of treating of *Citrus* culture than Mr Hume, the author of a similar work published in 1904, could be found as his long and varied experience are of the utmost value. As he says, the last twenty years have seen the industry standardised in every department. *Citrus* culture has become a great specialised commercial industry and holdings of hundreds of thousands of acres are common. Gone are the numerous varieties that made up the planting-lists of that period; in their stead a brief list of fruits remains, sufficient to cover the harvest season. Gone are the individually operated and crudely equipped packing houses. They have been replaced by community packing-plants in which fruits are handled in large quantities. This has made for greater uniformity in the product marketed and better returns to the grower. There is no fruit industry in which a husbandman may engage that calls for greater special technical knowledge if success is to be assured. And so this volume has been prepared to replace the older one issued in 1904. Nature has ordained that *Citrus* culture in the British Isles is negligible, but to our colonies and dependencies the subject has a great commercial interest. We, in these islands, as simply consumers, should, however, have some knowledge of the sources of supply and of the varieties of *Citrus* which come in. For instance, the recent use and growing popularity of Grape Fruit or the Dutch Pomelo, the name used by the United States Department of Agriculture, owes its English popular name from the fruit not being borne singly but in grape-like clusters of from three or four to eighteen. The botanical name used by Mr Hume is *Citrus paradisi* Macf., a native probably of South Eastern China, though it may have originated as a seedling-sport in the West Indies. The Grape Fruit is allied to the Shaddock or Pummelo. The Pummelo, which is yielded by *Citrus maxima* Merrill (the *C. decumana* of some authors), is a native of Malay and Polynesia. In the United States the popularity of the Grape Fruit is also of recent

origin: indeed it is only since 1885 that it has become a commercial fruit. About the beginning of the last century Don Phillipe, a Spanish nobleman, settled in Florida and planted some Grape Fruits. One of these is still living, and a photograph of it and one of its seedlings in the Davy Grove, Pinellas County, Florida, is given. It has a branch-spread of more than 60 feet. Cuba and California also supply Grape Fruit. A hybrid with the Tangerine (Tangelos) has been produced, and there are many varieties of which good figures are supplied. The book has thirty-one chapters and 237 figures. The History of the *Citrus* is given. China or Cochin China is the natural home of the Orange, whence it reached India, Japan, Europe, Africa, America, and Australia. America, till recent times, depended upon Italy for its Lemons. The *Citrus* crops of California alone afforded in 1923-24 the enormous quantity of 24,292,800 boxes, of which 6,100,000 boxes were Lemons, Florida coming in a good second with its 20,399,614 cases, but it is stated that the prices realised did not, in many instances, cover the cost of production. With a tree of such a long history of cultivation as the Orange, the wild stock of which, like that of the Barley, has never been discovered, there is an immense variation. More recently the Linnean genus, *Citrus*, has been split into three (1) the true *Citrus*, with one leaflet and an eight-celled ovary; (2) *Fortunella*, with a 3-6 celled ovary, which includes the Kumquat brought to England by Fortune in 1846, and (3) the prickly orange, *Poncirus*, a genus first separated by Rafinesque, which has three deciduous leaflets, the *Citrus trifoliata* of Linnaeus—*P. trifoliata* Raf., also a native of China. The King Orange is *Citrus nobilis* Lour., and of this the well-known Tangerine is variety *deliciosa*. The Seville sour orange or Bijarradi is *C. Aurantium*. An excellent and exhaustive account of the numerous commercial varieties is given. The Citrons (*C. medica*) are also fully treated of as well as the Limes (*C. aurantifolia*). The methods of Breeding New Varieties receive due attention. Other chapters deal with Judging, Propagation of *Citrus*-tree Stocks, Soils for *Citrus* groves, Location of *Citrus* groves, Preparation for Planting and Cultivation of *Citrus* groves and their Cover Crops (which include *Desmodium tortuosum* and *Stizolobium*, species of *Crotalaria* and *Vigna sinensis*), Fertilisers, Irrigation of *Citrus* groves, Pruning, Packing and Handling, Injurious Insects and Diseases and their Treatment complete a handbook that is a *vade mecum* of information and an absolutely necessary work to any one who wishes to cultivate the Apples of the Hesperides. As is the custom of the great firm of publishers who have produced this work, it is eminently attractive in its type, illustrations and arrangement.

HUTCHINSON, J., F.L.S. THE FAMILIES OF FLOWERING PLANTS. I. Dicotyledons. Arranged according to a new system based on their probable Phylogeny. Illustrations by W. E. Trevithick and the Author. pp. viii., 328, 1926. Macmillan & Co., London; 20/-. This very able contribution to Systematic Botany is appropriately dedicated to the memory of the authors of the "Genera Plantarum," George Bentham

and Joseph Dalton Hooker, the dedication being framed with beautifully drawn flowers of some of the more important Natural Families divided into the two groups—herbaceous and arborescent. The Foreword is written by the Director of Kew, Dr A. W. Hill, who says the author "has returned wisely, as I think, to the position adopted by the authors of the 'Genera Plantarum' since he regards the Ranales on the one hand and the Magnoliales on the other as starting points of his phylogenetic arrangement." The author, in his very useful preface, regrets that the classical "Genera Plantarum" of Bentham and Hooker has never been made available to English readers in a popular form. The general sequence, however, appeared in a translation from the French work of Le Maout & Decaisne, edited by Hooker, now long out of print. Had these distinguished authors seen fit to issue an English translation, illustrated by the gifted botanical artist, Walter Fitch, it is probable that that work would have held the field. As it is, it has largely been superseded by "Die Natürliche Pflanzenfamilien" of Engler and Prantl, published in German and copiously illustrated. Hutchinson gives a brief account of the systems of Classification—dwelling especially on those just mentioned and on the general principles adopted for the classification of Flowering Plants. In tabular form the summaries are ably shown and the fundamental differences between the systems of Bentham and Hooker, of Engler and Prantl, and of his own are clearly contrasted. A very useful Key to the Families of Dicotyledons is appended. A Key to the "Genera Plantarum" was made by F. Thonner in 1895, but it has been long out of print. This one is entirely independent of that, and is made on somewhat different lines. By its aid and the use of an ordinary pocket lens it will not be impossible for an intelligent person with only a slight knowledge of botany to allocate to their families most of the plants he may meet with. Hutchinson commences with the Magnoliales. The diagnoses of the Families are clear and precise and are beautifully illustrated by himself and Trevithick. Maps of the distribution are also supplied. Following this group come the Ranales, which include Ceratophyllaceae, followed by Nympheaceae and Berberidaceae. Then, preceding the Poppies, which is the English order, come the Aristolochiaceae (one is only alluding to the British Families). We may add that the Labiatae Family, No. 264, is the last family to be dealt with, Salicaceae being 217. This arrangement, while showing wide discrepancies from either Bentham and Hooker or Engler and Prantl, has a much closer tendency towards the former. This highly technical and important work deserves very careful criticism and attention from high authority. Dr Parkin, therefore, has been induced to give his views in a separate article which will be found in this *Report*. It only remains to be said how excellently the publishers have produced this highly original work. Botanists throughout the world should be very grateful for having it supplied in so compact and agreeable a form at a reasonable price. The author will receive not only criticism, which he invites, but, we hope, due recognition for his clever, laborious and original research.

INDEX KEWENSIS PLANTARUM PHANEROGAMARUM. Supplementum Sextum. Nomina et Synonyma omnium Generum et Specierum ab initio anni MDCCCXV. ad finem MDCCCXX. nonnulla etiam antea edita complectens ductu et consilio A. W. Hill confecerunt Herbarii Horti Regii Botanici Kewensis Curatores. Oxonii e prelo Clarendoniano MDCCCXXV.; 70/-. In the *Report* 342, 1921, the Fifth Supplement of this very important work was reviewed at considerable length. Now we have the Sixth Supplement dealing with the plants of the next five years, of which not all are necessarily new species since, for instance, the numerous reductions of L. Krause are each counted. The number of separate entries is well nigh thirty thousand. Having some close acquaintance with this last supplement one is greatly impressed by the accuracy with which it is compiled. It used to be said that works such as this were lucky to escape with five per cent of errors, but there is nothing like that percentage here, so the highest meed of praise may be accorded to those who worked at its compilation. The method adopted in this and the later supplements is not primarily to give cross references but the place where the new name is described. Occasionally a synonym is added and, at first sight, this would seem to suggest that it is to be considered as the valid name. That is not so. Let an instance be cited. On p. 14, vol. i., the New Zealand *Acaena Sanguisorbae* Vahl is kept as the valid name (to it *A. decumbens* is referred as a synonym) but *Sanguisorbae* is not the oldest trivial as it only dates from Vahl's *Symb. i.*, 294, 1804. An older one is to be found in *Ancistrum anserinifolium* of Forster's *Char. Gen.* 4, 1776, therefore a new combination had to be made (*Rep. B.E.C.* 601, 1916) as *Acaena anserinifolia* (Forst.) Dr., in which the original trivial is put under the correct generic name. The compilers shrank, and probably wisely, especially as it would break their new custom, from adding "vice *A. Sanguisorbae*" because they would be taking over the responsibility of the correct identification. In one case at least it seems that the cross reference is not correct. *Habenaria Gymnadenia* Dr. has the cross reference to *Gymnadenia conopsea*, but if we refer to Vol. ii., 1074, we find that *Gymnadenia conopsea* is itself referred to *Habenaria conopsea* Benth., to which the cross reference should be made. One may add that *Habenaria Gymnadenia* was coined by me because *Habenaria conopsea* of Reichb. f. in *Bonplandia* ii., 10, 1854, takes precedence of the combination *H. conopsea* Benth. which dates from 1880 (*Journ. Linn. Soc.* xviii., 354), as one cannot have two different plants bearing the same name, and since the permanence of the original trivial is not obligatory when it has been seized and attached to a plant in the same genus, as for instance, in the case of *Festuca uniglumis* Sol. The oldest trivial is *membranacea* (Sp. Pl. 1753 under *Stipa*) but in Linnaea in 1863 *Festuca membranacea* was established so that *F. membranacea* Kit. (according to the rule mentioned, with which I disagree) replaces the oldest trivial given by Linnaeus. Had the trivial *conopsea* or rather [*Orchis*] *conopea* L. been conserved then *Habenaria conopea* would be used in the sense meant by Linnaeus. Englerites use *Gymnadenia conopsea* (L.), and as there is no competitor in that genus the earliest trivial

can be retained. We are glad to see that many hybrids are now indexed, the word hybrid being put after the name. Probably it is now too late to make a change, but would not the sign  $\times$  before the name catch the eye quicker and save space? So, too, with regard to sub-species. Should those be indexed and how? It would be a great boon if they were. Would not a minus sign before the name be sufficient to so designate them? We are glad to see that some omissions from the previous volumes have been inserted. Is it too much to hope that some time the proper authors of names should be given which in earlier volumes were attributed to Bentham and Hooker, although they actually never made those combinations. Strictly speaking, one supposes that if they had not previously been made they should stand as ? Jackson, Hooker, or Dyer in Index Kewensis. For a glaring instance see under the genus *Carum*, where in the reduction of *Petroselinum* and *Bunium* the various species of those genera were not individually mentioned in the "Genera Plantarum." Of course, this has nothing to do with the present compilers for whose efforts to obtain such a high standard of perfection one cannot give too high commendation. One may add that the Clarendon Press has kept up its reputation in producing these volumes, and that the price of the first four volumes, bound in two, and the first five supplements is £21 in cloth, or morocco backed, £25 4/-.

IRISH NATURALISTS' JOURNAL, THE. Bi-monthly; 6/- subscription to J. Orr, Esq., 17 Garfield Street, Belfast. Editor-in-Chief, J. A. S. Stendall, Esq. Sectional Editors, S. A. Bennett, Esq., Rev. W. R. Megaw, and Prof. James Small, D.Sc. *Scirpus nanus*—as *parvulus*—has a notice with figure by Mr A. W. Stelfox. In its former station on the estuary of the Avoca River at Arklow it has not been seen since 1896 till this year when he found it growing plentifully at Kynoch's Dock. Mr R. A. Phillips and Mr A. W. Stelfox found *Colchicum* near New Ross, Co. Wexford, and with it *Allium oleraceum*, the second locality in Ireland. Here, too, grew *Serratula tinctoria*, var. *integrifolia* Koch. Mr Stelfox (p. 96) notes *Mathiola sinuata* on the coast of Wexford at Kil-michael Point. Mr R. L. Praeger contributes a paper on Irish Plant Geography, pp. 118 and 139, and our member, Mr Colin G. Trapnell, gives an account of the flora of Kincasslagh Head, Co. Donegal (p. 73). The presence of *Solidago cambrica* needs confirmation; it is a much misunderstood plant which is practically limited to Snowdonia.

JACKSON, DR B. DAYDON. Visit of Carl Linnaeus to England in 1736. A vivid account is given by Dr Jackson of his journeying to London which he reached at the end of July. His first visit was to Sir Hans Sloane, the President of the Royal Society. Dr Jackson dispels the illusion of Linnaeus going on his knees when he saw a field of gorse on Putney Heath. *Ulex europaeus* is a spring plant and Linnaeus could have seen it only in August or September. But why not *U. nanus*? His visit to England was not fruitless for he carried back a store of plants to embellish the garden of his patron, Clif-

fort, to whom Linnaeus gave Boerhaave's letter of introduction, which says "Linnaeus, who brings you this letter, is particularly worthy of seeing you and of being seen by you. He who sees you together will look upon a pair of men whose like can hardly be found in the world." He visited Miller at the Chelsea Garden, but the question of nomenclature—then as now—was a ticklish subject and Linnaeus's improving on the Tournefortian names did not suit Miller. His well-known visit to Oxford is described and how he conquered the aversion which Dillenius at first felt for the young botanist, who was going to bring confusion into the science, and how reluctant he was to part with him, offering, indeed, to share his stipend if he would stay. He also gave him a copy of the "Hortus Elthamensis," which had cost him so much time and money, and also his third edition of Ray's "Synopsis."

JOHNSON, W. H. COTTON AND ITS PRODUCTION. With an introduction by Sir Wyndham Dunstan and a foreword by Sir W. Himbury. pp. 536, and 26 maps. Macmillan & Co., London, 1926; 30/-. It will be remembered that Dr Goulding's "Cotton and Vegetable Fibres, their Production and Utilisation," was reviewed in our *Report* 75, 1917, and George Bigwood's "Cotton" in the *Report* 586, 1919. Now we have this highly important work, worthy of the great industry it is concerned with, produced in the thorough manner we expect of its author and the publishers. Sir W. Dunstan points out that our own Empire's contribution to the supply of Cotton is less than 10% of a total of which the United States afford 75%; of which 60% is used in manufactures in their own country and that this ratio is increasing although the growth of cotton there is not likely to be much further expanded. Therefore, he thinks, every effort should be made to increase the production of it within our Empire. There is great opportunity in India and the Sudan. Towards stimulating the industry the British Cotton Growing Association has, for nearly a quarter of a century, done much to augment Empire Production. In 1912 the approximate estimate of Cotton grown in new fields in the Empire amounted to 71,490 bales; in 1921 it had increased to 165,200, and in 1924 to 261,900 bales. Large grants were made to East and West Africa and, despite the barren years of the Great War, the increase has grown from 1900 bales in 1903 to 261,900 bales in 1924. The author's experiences of 20 years, not only in Africa but in wide travel, are drawn upon to produce this monumental work. The first chapter is headed Historical. Cotton was known in India in 800 B.C., and Theophrastus (350 B.C.) describes it. The name is derived from the Arabic Kutn, Katan, or Kutun, but it is extraordinary that up to the Eighteenth Century the western world was almost ignorant of its existence. It came into England in 1298 when it was used for lamp-wicks. In 1772 Arkwright and Strutt successfully made goods with cotton warp. Five times more cotton than wool are now used in making clothing. In Britain three million people are entirely dependent on cotton for their means of livelihood, and ten million are affected by it. Its history forms most attractive reading. The second chapter—Botani-

cal— gives a description of the species of *Gossypium*, derived from Gossypion, the name by which Pliny says it was known in the island of Tylos. The various sections of the genus are described. The length of the lint-fibres varies greatly—from a fraction of an inch to over two inches, the West Indian having a long fibre. The diameter, too, differs considerably—from Indian, 0.00084 of an inch to the Sea Island, 0.00064, one of the finest fibres. Then come exhaustive details of Cotton growing in the various countries of the world. The United States heads the list where, within the Cotton Belt, it is by far the most important crop exceeding that of all the others combined. Then comes India where over 22 million acres are under its cultivation. Egypt has about six million acres, cultivated necessarily under irrigation. Brazil, where it has been grown since 1570, has about one and a half million acres. China is the third largest cotton producing country in the world, 1,862,000 bales being produced in 1924. Russia has its principal cotton areas in Turkestan and Transcaucasia. The British Empire Cotton producing colonies are then treated of at length. Sudan has about 43,000 acres under Cotton and its potentialities are enormous. The minor Cotton growing countries are detailed. Other chapters deal with Cotton Cultivation, Handling and Marketing, and Cotton as viewed from the manufacturers' standpoint, including the extending uses for Cotton. It has largely replaced leather for belting and "grips," and portmanteaus are now made of it so as to closely imitate leather. My friend, Mr Fuller Calloway of Georgia, one of the largest cotton manufacturers in the States, showed me hand-bags which had withstood wear and tear in a remarkable manner. In the manufacturing of motor tyres and high explosives large quantities are used: indeed its uses are legion. Suggestions for the Improvement of Cotton, and an account of the Diseases to which it is subject, its Insect Pests, and its Bye-Products are included. The world's production is roughly eleven million tons, which can yield two million tons of oil and eight million tons of food (cotton-cake). It is suggested that 20 per cent. of its meal added to wheat makes a highly nutritious flour. Much of it was so used during the Great War in the United States. What we had to try and assimilate in Britain no tongue can tell. Even now it is not easy to obtain a pure wheat flour. The waste fibres from cotton are not lost. Among other substances which can be made from them is artificial silk. Cotton manufacturers are as ingenious as the Chicago butchers.

JOURNAL OF BOTANY, THE, British and Foreign, 1926. Edited by A. B. Rendle, F.R.S. Monthly, 2/-. The new British plants are noticed in our Plant Notes. *Epipactis*. Col. M. J. Godfery (p. 65) discusses the relationships of *Epipactis leptochila*, var. *dunensis*. For various reasons he concludes this should be considered a full species which he calls *Epipactis dunensis* Godfery. *Orchids*. On p. 106, T. A. Sprague discusses the nomenclature of three Orchid genera—*Epipactis* or *Helleborine*, *Serapias* and *Goodyera*. He points out that *Serapias* was first used by Linné in 1735 where he cited *Helleborine* as a synonym, and later (1740)

he added a second species which was *Serapias lingua*. Hence the first genus, which in Druce's "List" is called *Helleborine* (stated to be a nomen abortivum), must be called *Serapias*. *Serapias lingua* then becomes *Serapiastrum* of Kuntze. *Epipactis* was used by Zinn in 1757 for the combined genera of *Ophrys* and *Serapias*, and is here a nomen abortivum. In 1762 it was used by Boehmer for *Goodyera repens* R.Br., hence *Epipactis* Boehmer should replace *Goodyera* which was not published till 1813. As such changes would be disadvantageous the author proposes conserving *Epipactis* (type-species *E. Helleborine* (L.)), *Goodyera* (type-species *G. repens* R.Br.) and *Serapias* (type-species *S. lingua*).—Abstract by R. W. BUTCHER. British Orobanches. H. W. Pugsley (p. 16) compares the Orobanches as listed in the London Catalogue, 11th edition, with those of Beck's Monograph. He comes to the following conclusions. *Orobanche arenaria* Borkh. is an erroneous record. *O. Ritro*, var. *hypochaeroides* Beck is treated by Beck as a variety of *O. major* L. = *O. elatior* Sutton. *O. rubra* is considered by Beck as a form of *O. alba*. *O. amethystea* of British botanists is not identical with that of Beck's Monograph. The latter has much larger flowers, long subulate calyx-teeth, less glandular corolla, and *Eryngium campestre* is its chief host. The stations are mostly inland. The Isle of Wight plant is considered to be *O. minor*, but no suggestion is made as to the identity of other plants. Some of the more recent records of *O. picridis* on *Orepsis virens* may possibly be *O. minor*, which grows on a variety of hosts.—Abstract by R. W. BUTCHER. Dr Church continues, in several contributions, his "Reproductive Mechanism in Land-flora. Some excellent observations (p. 48) are made on British Lemnaceae by J. Gordon Dalgleish. R. Grierson gives a note (p. 61) on *Ledum palustre*. Since the Yorkshire plant proves to be an American species, it will be interesting to hear what the Flanders Moss species may be. Dr A. K. Schindler (p. 145) treats of the Leguminosae-Desmodiinae quoted in Ray's "Historia Plantarum," Vol. iii. Report on the Longevity of the fruit of *Nelumbium*, by Ichiro Ohga (p. 155). In 1850 Robert Brown succeeded in germinating some seeds of *Nelumbium* collected by Sir Hans Sloane 150 years before. 85% retained their germinating powers. Ohga repeated the experiments with seeds which had been attacked by mould but found that they had lost their vitality. Some seed which he obtained from peat-deposits in Japan had 100% vitality. Their exact age has not been ascertained, but probably they are as old as those of Sir Hans Sloane. The British Association meeting at Oxford (p. 240). A poem (?) on *Orchis praetermissa* (p. 256). Notes on the British Pansies, by Dr Drabble (p. 263). Index to Bibliographical Notes in the *Journal of Botany* 1893-1924, by J. Ardagh (p. 274). Fourth International Botanical Congress, by Dr Rendle (pp. 296 and 317). Notes on the Genus *Potamogeton* of the "London Catalogue," by A. Bennett (p. 329). A supplement is devoted to John Gossweiler's Plants from Angola and Portuguese Congo, by A. W. Exell and R. D'O. Good. As usual there are some interesting biographies of botanists.

**JOURNAL OF ECOLOGY.** Edited by A. G. Tansley, M.A., F.R.S. Cambridge University Press; 45/- post free. Includes, among other papers, "Studies on the Ecology of the English Heaths," V. S. Summerhayes and P. H. Williams, p. 203; "Vegetation of the English Chalk, Sussex Downs," A. G. Tansley and R. S. Adamson, p. 10; "A Soil Survey of Hindhead Common," F. M. Haines, p. 33; "Soil-sourness and Soil Acidity," W. H. Pearsall, p. 188; "Salt Marsh Vegetation of Little Island, Co. Cork," R. H. M'Creagh, p. 317; "Yew Communities of the South Downs," A. S. Watt, p. 282.

**KEEBLE, Sir FREDERICK,** Professor of Botany in the University of Oxford. **LIFE OF PLANTS.** pp. viii., 256. The Oxford University Press, 1926; 5/-. Clarendon Science Series. Gen. Editors, Julian Huxley and D. L. Hammick. This charming volume comes to me with pleasure mixed with pain for the year which saw its birth also witnessed the severance of the official connection, as Sherardian Professor, of Sir Frederick Keeble with the Oxford Botanic Garden where it was prepared. One may take this opportunity of acknowledging the unvarying kindness and courtesy that I met with at his hands since his election to that chair. The book has been widely reviewed, and there is an unbroken consensus of opinion regarding the delightfully skilful manner and the great literary style which it evidences. The Introductory is a splendid example of a vivid and terse account of the part which plants play in the world and in exquisitely chosen language the author says—"The sun shone in far-off times on the leaves of prehistoric green plants which grew, it may be by estuarine waters. Of the radiant energy which fell on a leaf, some was absorbed by the green tissues and served for the manufacture of sugars. Much of the sugar was consumed by the plant in the course of its life, but some, undergoing relatively little chemical change, became part of the woody skeleton. Presently the tree died and fell into muddy ooze. Before decay could complete its work of destruction the plant was embalmed and carbon, hydrogen and oxygen, united originally by the sun's energy and the plant's activity, remained united still, though as time went on some of the hydrogen and oxygen was lost, and the plant remains became more and more carbonised. Therein the energy derived from the sun remained dormant until in the furnace of the steam-engine the coal unites with oxygen, reforms water and carbon dioxide, and liberates the long-stored energy: and so in the singing of the escaping steam there is an echo of the incidence of a ray of sunlight on a green leaf ages before the beginning of recorded time." In this graphic manner facts are told which impress the memory and, instead of a dry skeleton of bare detail, a life-like image is presented. The student is led on to consider the Vegetable Kingdom and its members, Fungi and Bacteria, the wheat grain, its composition and its germination, and what the wheat harvests mean. These cover some 400,000 square miles, about three times the area of the British Isles. Much as we decry British agriculture it is gratifying to find that we rival Germany in our standard of cultivation, and are only, and there only in

small areas, beaten by Belgium and Holland. As Sir Frederick graphically says, "If man could live by bread alone the world's harvest of 98½ million tons would provide sustenance for well nigh 300,000,000 men." In a charming manner we are taken over the whole range of plant life, and are given a clear account of the Mendelian theory, of phytosynthesis, of carbohydrates, of chromosomes as the material basis of heredity and of hormones, on which the last word has not been said. The illustrations are very helpful in elucidating the various problems dealt with. The price is very small in these days of dear printing, and the little work, written as it is by a man with a facile pen who knows what to say and how to say it in the fewest possible, yet well chosen, words, which has enabled the matter to be compressed into a very small space, should have a wide range of readers who will be grateful for its production.

KEW BULLETIN OF MISCELLANEOUS INFORMATION. Published by H.M. Stationery Office. This increasingly interesting, well produced and very cheap publication contains many papers of taxonomic interest. The first number for 1926 contains an account of the Gamble Herbarium which includes about 50,000 sheets mostly of Indian species. F. J. Chittenden and W. B. Turrill give Taxonomic and Genetical Notes on some species of *Nemophila*—a genus with a basic chromosome number 9. T. A. Sprague discusses "Standard Species," and gives examples. W. B. Turrill, "On the Flora of the Nearer East." H. K. A. Shaw and W. B. Turrill, "Revision of Sibthorp's Plants at Kew." It may be said that these plants were removed by Alexander Prior from the Oxford Collection with or without authority. He may possibly have considered them as duplicates, but the proceeding cannot be defended as they were definitely the possession of Oxford University. Prior was acting as an assistant to Dr Daubeny at the time, and that was doubtless the period when they were removed as he attempted to do something at the collection. T. A. Sprague and M. L. Green, "Alphabetical List of Nomina Rejicienda." While the date for the accepted genus is given, that for the rejected one is not. Sir George Watt on *Gossypium*. Additions to the *Index Kewensis* from K. Koch's *Hortus Dendrologicus*. W. G. Craib, "Contributions to the Flora of Siam." "Exhibit of Historical Pictures of Kew." T. A. Sprague, "An account of Sessé and Moçino's *Plantae Novae Hispaniae* and *Flora Mexicana*." C. E. C. Fischer, "Contributions to the Flora of Burmah." M. L. Green, *Crantz Classis Umbelliferarum Emendata*, 1767. Shows that in *Caucalis nodosa* Crantz has precedence over Scopoli. An Appendix (I/-) gives a List of Seeds of Hardy Herbaceous Plants which ripened at Kew in 1926.

LAING, R. M., and BLACKWELL, E. W. PLANTS OF NEW ZEALAND. Demy 8vo., pp. 475, tt. 175. Ed. 3, revised and rewritten. Whitcombe & Tombs, Auckland, and 9 and 10 St Andrew's Hill, London, E.C.4, 1926; 15/-.

LAWSON, Prof. A. ANSTRUTHER, lectured in January before the Royal Society of Edinburgh on "Endemism and Evolution as observed in the

Australian Flora." Although the flora is large, 70 per cent. of its species and about 30 per cent. of its genera are endemic. The genus *Eucalyptus*, with its 300 species, stands out as the most conspicuous feature, being distributed over the whole continent except the barren deserts. The Leguminosae are second, and the Proteaceae third in numbers. Hybridisation, followed by natural selection, have been the main factor in the evolution of the Australian flora.

LEWIS, FRANCIS J., D.Sc., and DOWDING, E. S., M.Sc. The Vegetation and Retrogressive Changes of Peat Areas (Muskegs) in Central America. Journ. Ecol. 317, 1926. The area described lies within thirty miles of Edmonton, the altitude being between 2180 and 2500 feet. In an area of 400 square miles there are several hundred lakes varying from Cooking Lake, 9 miles long to small pools 300 feet across. Almost all of them are quite shallow. They are frequently bordered with Carices and Scirpi, backed by zones of Willow or Spruce. The vegetation is described in detail, and there are some pleasing illustrations. Sphagnum, which until recently had dominated the muskegs, is tending to disappear and to be replaced by vegetation indicating drier conditions.

LINNEAN SOCIETY, PROCEEDINGS OF THE. Burlington House, Piccadilly, London. Annual Subscription, £4. November 1925, June 1926, December 1926, pp. 135; 8/-. Meetings. November 19, 1925. Dr H. S. Holden and S. H. Clarke, "On the Seedling Structure of *Tilia europaea*. *Tilia vulgaris* in 1923 seeded well and 70 seedlings were noticed at Nottingham in 1926. December 17. Prof. R. R. Gates gave an extremely interesting lecture, with lantern slides, on "The Vegetation of the Amazon Basin." The area has the largest amount of unexplored country in the world and its drainage area far surpasses that of any other river. January 7, 1926. E. M. Marsden Jones, "The Fertilisation of *Primula vulgaris*, illustrated with lantern slides. The conclusions drawn were that the Primrose is fertilised by diurnal insects and that nocturnal Lepidoptera play no part in it. Prof. F. Wood-Jones gave a brief account of the Fauna and Flora Preserve in Kangaroo Island, South Australia. February 4. Dr C. C. Hurst read a paper on "The Nature and Origin of Species in *Rosa*." February 18. Prof. F. O. Bower expounded, and illustrated with a series of lantern slides, "A Scheme of Phyletic Grouping of Ferns." H. W. Pugsley, "Further Notes on *Fumaria* and *Rupicapnos* with their Species." March 18. J. L. Sager, "Primula with phyllody of corolla." Specimens were shown from Maidstone and Lympstone, N. Devon, and a caulescent form from Mullion gathered by Walter Barratt. April 15. Prof. Carl Schroeter delivered the Hooker Lecture on "The Swiss National Park." May 6. It was announced that Dr B. Daydon Jackson had been appointed Curator of the Linnean Collections. Dr A. W. Hill read a paper on the Genus *Lilaeopsis*, and Mr R. D'O. Good a paper on the Genus *Empetrum*. May 27. Dr E. J. Allen was awarded the Linnean Gold Medal, and Sir David Prain formally presented the subscribed portrait of Dr B. Daydon

Jackson to the Society. The President's Address was given by Dr A. B. Rendle. It included obituary notices of Professor Bateson, Francis Darwin, Dr Henry Drinkwater, J. C. Gamble, Prof. George Henslow, W. P. Hiern, J. H. Maiden, Jean Massart, Sir Wm. Schlich and G. Schweinfurth. June 10. I. H. Burkill gave a lecture on the Vegetation found by him on lava surfaces of various ages in the crater of Kilauea, Hawaii. T. A. Sprague, "The Taxonomic Position of the Adoxaceae." He places them in Rosales beside *Saxifraga* and nearest *Chryso-splenium*. S. J. Mukerji lectured on the Aquatic and Marsh Vegetation of the Dal Lake, Kashmir.

LUTZ, DR FRANK. Nat. Research Council, U.S.A. Dr Lutz has done much statistical work on the colours of flowers in particular regions. Out of some 4000 North American flowers 31% were set down as green, 24% white, 20% yellow, 11% purple, 8% blue, and 6% red. Deducting anemophilous species the percentages remained much the same but green fell from 31% to 8%. To our eyes there are fewer red than of any other colour, but spectroscopically not 8 but 80% of conspicuous flowers are strongly red. Not only blue, but very many, if not most, yellow flowers are as red as red flowers. The reason why they seem white or yellow to us instead of red, is that they reflect other colours which overpower the red. About 50% of conspicuous flowers are strongly blue. From observations on about 100 flowers, Dr Lutz came to the conclusion that most of the yellow, many red and blue flowers are strongly ultra-violet, but that few or no white flowers are so. In all some 30% of conspicuous flowers are strongly ultra-violet. As regards the results of his experiments regarding the visits of insects being induced by colour he thinks the case weighs against the generally accepted theory that the colours of flowers have been developed by natural selection in relation to the visits of insects. Insects, he says, as a class are noted for poor vision, but for a high development of the sense of smell. He is far from asserting that his results are final.

MACSELF, A. J. PLANTS FROM SEED. pp. 239, with 4 coloured, 8 half-tone, and 12 text figures. Thornton, Butterworth, Ltd., London. 1926. This is one of the excellent series of "Home Garden Books" of which Mr Macself, a well-known practical gardener, has already issued seven volumes. In this, the eighth of the series, the author urges the use of seeds wherever possible for the propagation of plants in preference to any other method as seedlings are almost invariably more robust than young plants which are obtained by other means. If this advice be followed a well-stocked garden may be obtained at the least possible outlay, and there is the added charm of being able to watch over the young plant from its earliest appearance. Miss Winifred Walker has done much to add to the attractiveness of the volume by her charming illustrations. The author divides his plants into three groups—Hardy, Half-hardy, and Tender. The second class cover those which cannot withstand the rigours of a British winter, and the third class are un-

fitted for outdoor culture. The arrangement is alphabetical, but one wishes that capital letters were not used for the species in all cases. The first sub-group is a list of plants which may be sown in places where they may remain; the second consists of those which may be transplanted. Unfortunately a capital P., A. or B., designating Perennial, Annual, or Biennial, is placed before the specific name, thus—"P. Aconitum Monks Hood," or "P. Actaea"—the latter, of course, being *Actaea spicata*. *B. Scabiosa* is used which is quite misleading. The letters should have been put at the end of the paragraphs. There is, among others, a beautiful photograph of the fruiting head of *Anemone Pulsatilla*. A chapter is devoted to Brief Notes Regarding Special Requirements of a few Hardy Perennials. Tricky Alpines have a helpful chapter and Aquatics are not neglected. Vegetable Seeds and Hybrids have separate chapters full of good practical advice. A calendar, with its monthly sowings, is thoughtfully appended. Even with a plethora of gardening books, there is ample room for this handy volume.

MARLBOROUGH, REPORT OF THE NATURAL HISTORY SOCIETY OF. This was founded in 1864. 529 species were recorded for the year 1925. The assistance of our member, Mr C. P. Hurst, is acknowledged. He found *Hieracium Baulinii* on the railway bridge at Gt. Bedwyn. Miss Todd added twelve Brambles and four Violets to the List. A *Utricularia* and an escape, *Doronicum Pardalianches*, are also included.

MARTIN, ISA H., M.A., F.L.S. The Field Club Flora of the Lothians by the Botanical Committee of the Edinburgh Natural History Society, Edited by Miss Martin. With Map of the Lothians, Illustrated Glossary, and Ecological Lists. W. Blackwood & Sons, Ltd., pp. 142, 1927; 3/6. In this very compact and excellently printed book a great amount of local knowledge is included. The records are carefully compiled and there is a commendable freedom from misprints. The Ecological Lists will prove very useful. There is a copious and illustrated glossary so that the path of the learner may be smoothed. An asterisk before the name denotes that the plant is not native but more or less well established in the area. One might suggest that a dagger before the name might have been used to mark alien plants instead of "Cas." after the name, as more likely to catch the eye. We note that many of Mr Fraser's aliens recorded in our *Report* are omitted and one would have liked a more up-to-date treatment of the Orchids, as, for example, *Orchis latifolia*, Marshes, &c., Frequent, where eight habitats are given. Some, if not all, of these are *O. praetermissa* or its var. *pulchella*, or *O. purpurella*. Again *O. maculata* L., common, would scarcely apply to *O. Fuchsii*, while four habitats are given for *O. ericetorum* which has two or three older names, and is the *O. maculata* of the *Sp. Pl.* and *Herb. Linn.* There is no allusion to *Dianthus glaucus*, *Lychnis Preslii*, or *Polygonum calcatum* which were first reported from this area, nor for *Thymus Drucei* from North Berwick. *Lonicera Xylosteum* is given as native. Varieties are mostly omitted or sometimes without justifica-

tion raised to specific rank, i.e., *Senecio discoideus*. *Hieracium murosorum* is alone given to cover the *sylvaticum* and *vulgatum* series. *Symphytum patens* Sibth. is only a variety of *S. officinale*, the type not being given, and *Phleum stoloniferum* is by no manner of means a species. Only *Euphrasia officinalis* is listed and one *Thymus*. *Euphorbia Esula* is probably *E. virgata*. Certain erroneous names persist. "*Carex canescens* Auct. non Linn." This dates from the "Species Plantarum" and precedes *C. curta* Good.; *Melica montana* (= *M. nutans*) and *Alnus rotundifolia*, which is *A. Alnus* = *A. glutinosa*. The *Populus nigra* is chiefly, if not wholly, *P. serotina*. We doubt if *Asparagus maritimus* (sens. strict.) occurs in Scotland, \**Agropyron repens* (hybrid with *A. junceum*) is my  $\times$  *A. Hackelii*. It is native. Does no *Nitella* grow in the area? Such are running commentaries and are given in no carping manner. Instead we offer a warm meed of praise to the compilers of this very useful volume which we are sure will have a large sale and do much to stimulate the study of the local flora.

MARRET, L., BEAUVERD, G., and CORREVON, H. *Icones florae alpinae plantarum*. 3rd Ser., tt. 69. P. Lechevalier, Paris.

MATTHEWS, J. R. *Distribution of Certain Members of the British Flora (III.): Irish and Anglo-Irish Plants*. Ann. Bot. 773, 1926, with 5 diagrams in text. This is a valuable contribution to the vexed question of plant distribution. He says sixteen species of flowering plants are restricted in the British Isles, as native plants, to Ireland:—*Arabis ciliata* [*A. ciliata*, var. *hibernica*], *Arenaria ciliata* [*A. Brownii* Jord.], *Saxifraga umbrosa*, *S. Geum*, *Inula salicina*, *Arbutus Unedo*, *Erica Mac-kaii*, *E. mediterranea* [var. *hibernica*], *Daboecia polifolia* [*Boretta cantabrica*], *Euphrasia salisburgensis*, *Pinguicula grandiflora*, *Habenaria intacta*, *Spiranthes Romanzoffiana*, *Sisyrinchium angustifolium*, *Potamogeton Kirkii*, *Glyceria festuciformis* [sic]. Of these nine are Iberian and two of American origin (the *Spiranthes* and the *Sisyrinchium*), but it is doubtful if the latter is native although so completely naturalised, but not more so than *Matricaria suaveolens*. Mr Matthews says:—"While the hibernian species are essentially western, *Glyceria festuciformis* has established itself in N.E. Ireland. Doubts have been expressed regarding its indigenuity, but Dr Praeger regards it as native." There is no doubt that the *Glyceria* is native there, but there is grave doubt of its identity with the Adriatic species. Hackel refused it, and I have named it *Glyceria maritima*, var. *hibernica*. It also occurs in Cornwall, Hants and Sussex, and so it should not have been included in the species found in Ireland and not in Britain. There are 68 Anglo-Irish species and the distribution of these is thoughtfully discussed. In the southern half (divisions 1-20) all but 3 of the 68 species are found while 43 occur in the northern half. One might suggest that *Potamogeton varians* is not of much value for comparison since its grade is uncertain and it is highly critical. *Viola stagnina* is also in the Thames drainage. Discussing the question Mr Matthews pictures the British

Flora as the resultant of numerous invasions from the Mainland, coming from different directions. At least five can be distinguished (1) East Anglian, (2) Kentish, (3) Channel, (4) Peninsula, (5) Cornacian. These have shared in the building of our flora over a long period subsequent to the time of maximum glaciation. Personally I have doubted the indigenuity of *Simethis* at Bournemouth and have thought its seeds may have come in with the Maritime Pine. In Ireland it appears native. *Diotis* is by no means extinct in Britain. I have seen it from three counties in recent years. In the summary Mr Matthews notes that the range of the rarer species points to a close connection between S.E. Ireland and S.W. England. A prolonged invasion from the south-east became the dominant one and accounts for the preponderance of the Central European element in our flora.

MATTHEWS, J. R. Fife and Kinross Roses, in Trans. Bot. Soc. Edin., vol. 29, 219, 1926. All the main species are recorded except the southern plants, *R. agrestis*, *stylosa* and *tomentella*. *R. arvensis* is recorded as a probable introduction. The distribution appears to be *R. glauca* and *R. coriifolia* dominant in Kinross and at higher altitudes, and *R. canina* and *R. dumetorum* dominant along the south coast of Fife. *R. spinosissima* is chiefly near the seashore and occasionally inland on dry soils. *R. mollis* and *R. tomentosa* are more evenly distributed in the counties. —Abstract by R. W. BUTCHER. Note on the Flora of Salisbury Crags, l.c. 226. With G. Taylor. The Structure and Development of the Stamen in *Erica hirtifolia*, l.c. 235.

MESLIN, ROGER. Bull. Soc. Linn. Normandie. Ser. vii., Edition viii., 14 (1925), 1926. *Bryum neodamense* Itz., &c. This Bryum occurs on the Sands of Barry and at Southport. Mr Meslin found it at Muneville-le-Bingard, Manche. × *Erica Watsoni*, dans les Landes de Sessay, p. 71.

NATURALIST, THE. A monthly illustrated Journal, principally for the North of England. Edited by T. Sheppard, M.Sc., and T. W. Woodhead, Ph.D., M.Sc. 1/6 monthly; 15/- yearly, post free. This popular periodical is, as usual, full of interest. Among other papers are:—*Impatiens glandulifera* and other alien plants, G. C. Druce. *Ledum* on Blackstone Edge. The plant recorded in *Journ. Bot.* 178, 1925, as *palustre* proves to be the American *latifolium* and was, of course, planted there. Notes on the Vegetation of Spurn, Yorks. An aberrant specimen of *Cardamine pratensis*, J. M. Brown. *Centaurea* vice *Erythraea*, G. C. Druce. Gives reasons for choosing the former name. Additions to the Flora of Cheshire, N. Woodhead. A valuable list. Remains in the Peat of the Southern Pennines. Mr Flintoff records the occurrence of *Lactuca alpina* in N.E. Yorks. I should much like to see the specimen. Can it not be *macrophylla*? *Centaureum pulchellum* in the Lees estuary on the Yorks Side, T. A. Lofthouse.

NATIONAL TRUST FOR PLACES OF HISTORICAL INTEREST OR NATURAL BEAUTY. Annual Report, 1925-6, pp. 103. Subscriptions from 10/-.

The frontispiece is a photograph of Bodiam Castle, recently left to the Trust by the Marquis of Curzon. Additions during the year to properties already acquired include Thurstaston Heath, Irby Hill, Boxhill, Wicken Fen, Colley Hill, Hydons Hill and Westbury College. The new acquisitions are Ashridge, Ivinghoe Beacon, and portions of Ashridge Park and Berkhamstead Common. It is sincerely to be hoped that Ivinghoe Beacon will not suffer the fate of Burnham Beeches. Others acquired are Bodiam and Tattersall Castles; Manor House, Princes Risborough; and Borthwood Copse, Isle of Wight. It may be said that the Ashridge area was obtained by subscriptions amounting to over £45,000 through the generosity of Mr and Mrs Charles Rothschild and her family and at the wish of her late husband. The King's Head Inn, Aylesbury and the Manor House, Princes Risborough, were transferred to the National Trust. A map of England is supplied showing the positions of properties vested in the Trust.

NATURE. Macmillan & Co., St Martin Street, London. Yearly subscription in Britain, £2 12/-.

NATURE RESERVES, SOCIETY FOR THE PROMOTION OF. Handbook 1926. President, the Viscount Ullswater, G.C.B. After a detailed report of the properties under their charge, a Wild Flower Poster was adopted, and a circular letter sent to County Councils throughout Great Britain. The Poster runs as follows:—

WILD FLOWERS.

Save the Flowers by picking sparingly. If picked the flowers last but a little while, and unless a sufficient number of them is left to seed, the flowers will disappear.

The beauty of the countryside would be sadly marred were no flowers to blossom on the banks or in the woods.

Do not UPROOT PLANTS or BREAK TREES or SHRUBS.

Plants and trees as Nature placed them are a delight to the eye; let all who pass by enjoy them.

NORTHAMPTONSHIRE NATURAL HISTORY SOCIETY, JOURNAL OF. The December number contains an account of the Jubilee meeting which was held on October 21, 1926. The President, Earl Spencer, was in the chair at the Dinner and proposed the toast of the Society in an excellent speech which was replied to by Dr G. Claridge Druce, who was one of its founders in 1876. The toast of the President was proposed by the Hon. Sec., Mr H. N. Dixon. Lord Spencer then left, and Dr Druce took the chair. On behalf of the members he presented the Editor of the Journal, Mr Beeby-Thompson, with pieces of plate and a dinner service, and Mr H. N. Dixon with two oil paintings and books in recognition of their many years of work for the Society. A brilliant conversation followed. In connection with the Jubilee an interesting exhibition in the Museum was also arranged.

NORTH WESTERN NATURALIST, THE. Edited by A. A. Dallman, F.C.S., with H. Britten, G. H. Carpenter, D.Sc., F. H. Green, J. W. Jackson, M.Sc., C. L. Walton, M.Sc., Ph.D., F. E. Weiss, D.Sc., F.R.S., and A. Wilson, F.R.Met.S. as able collaborateurs. T. Buncle & Co., Arbroath. Issued quarterly. Yearly Subscription, 7/6. An excellently printed and neat publication with much readable matter. There are some excellent articles and the Bibliography and notices of current scientific literature are most useful. There is an appreciation of Dr W. E. Hoyle, that born scientific organiser, the late keeper of the National Museum of Wales. The Vegetation of some Welsh Lakes is treated of by N. Woodhead. The altitudes of 29 lakes are given, that of Marchlyn Mawr, 1979 feet, being the highest. We hope that Llyn-yr-Afon, the home of *Potamogeton Griffithii*, may receive attention. It is highly important to know what species of Pondweed grow there. A good account of the Liverpool Botanical Society's excursions is given. In that to Willaston a specimen of *Phleum pratense*, var. *nodosum* L., is recorded with a spike five inches long. May this not be *Phleum intermedium* Jord., which is a larger plant than typical *nodosum*? Much, if not all, of the Scotch Timothy is this plant. We heartily congratulate the editorial staff on producing such an excellent publication. One hopes that additional subscribers may be found so that the heavy expenses may be adequately met.

PAX, F. The Hieracia of Silesia, in Bot. Jahrb. 39, 1924. The genus probably occurred as early as the Tertiary. Hybridity, rather than the mutation theory, is considered the more probable cause of the many variations. Some hybrids have "apparently become species."

PERRIN & BOULGER. BRITISH FLOWERING PLANTS. 4 vols., tt. 300 coloured. Special offer by J. Thornton, 11 Broad Street, Oxford, £5 5/-.

PHILLIPS, REGINALD W. On the Form of Protoplast in Cells of the Genus *Ceramium* and those of *Dasya coccinea*. New Phyt. 277, 1926. A pathetic interest attaches to this, the last paper the Emeritus Professor wrote.

PRESLIA. Report of the Czecho Slovak Botanical Society, 1923-25, Praha. Contains many additions to the Flora of Western Australia, and an attempt to classify Bohemia into natural geographical districts.

RAYNER, J. F., F.R.H.S. A Standard Catalogue of English Names of our Wild Flowers, to which are added the Ferns and their Allies. pp. 56. Simpkin, Marshall, Hamilton, Kent & Co., London; H. M. Gilbert & Son, 24 Above Bar, Southampton, 1926; 1/6. This List is clearly printed and arranged in the ordinary sequence. The English names come first followed by the Latin ones. Many botanists, of whom I am one, see little use in translating, however accurately, the Latin name into its English equivalent and feel it is the wiser course to induce the beginner to learn the Latin name. What advantage can it be to speak of

the Yellow-juiced Smooth Long-headed Poppy, a verbage as bad as pre-Linnean names, instead of *Papaver Lecoquii*. Nor can one justify the use of the Fan-leaved Crowfoot, Pink Water Crowfoot, Scotch Scurvy Grass, Long Clustered Bramble or Prickly Bramble (a character not limited to a single species), Stitchwort Marsh Chickweed (which defies the elect), the Hybrid Water Starwort (a plant which may not be of hybrid origin), the Pasture, Bushy, or Narrow-leaved Eyebright, Slender Bladderwort, Scottish Knotweed, Thread-rush, Twig-rush, Long-stalked Pondweed, Saffron Walden Mustard and Braemar Pearlwort. For the Wild-flower Society a list of English names is supplied for which Mr Rayner's may be an improvement, but one wishes that all members of that excellent Society over twelve years of age should be encouraged to face the music, and receive higher marks for using scientific names. One may be met with the tu quoque "You scientific botanists don't always agree upon a name." That is true, but there is no reason to widen the sphere of disagreement by introducing British names which have an even wider range of variation. Even if two people use a different scientific name for the same species, there is little difficulty in finding out what plant is meant. This is a long digression from the review of our valued member's little book which is so well produced. It includes 1619 species names besides many others put in a subordinate grade. The work is singularly free from misprints. *Myosotis sylvatica* and *Lycium chinense* might, in another edition, replace those used, and the names of the Italian botanists are Balbis and Allioni, not Balbi or Allion. The Index is good and the price very cheap.

RENDLE, ALFRED BARTON, D.Sc., F.R.S., P.L.S. THE CLASSIFICATION OF FLOWERING PLANTS. Vol. ii. Dicotyledons. pp. xix., 636, tt. 279. Cambridge University Press, 1926; 30/-. Twenty years have elapsed since the publication of the first volume treating of the Gymnosperms and Monocotyledons, and this, the completion of the Dicotyledons, must be a matter of congratulation to its author who, still adhering to the "Pflanzenfamilien" and "Pflanzenreich," has given the botanical world in a compact form, a work of great importance. The arrangement adopted does not complain to be strictly phylogenetic nor could it be. Too much stress is laid, one thinks, on the importance of such an arrangement. At the present time the botanical student is fully provided by this work of Dr Rendle's, "The Morphological Study of Monocotyledons" by Miss Arber, and the more distinctive work, from a systematic point of view, by Mr Hutchinson. Each of these, to some extent, supplements the other and the trilogy may fairly compare with the German output of the same period. What systematists dread is the continued alteration of sequence which makes the consultation of herbaria so unnecessarily difficult. This work of Dr Rendle's follows, in the main, that of Engler and Prantl. The work bears evidence of great care and is well printed and illustrated. One is pleased to see that the Monochlamydeae are retained, and that Ulmaceae and Urticaceae are kept as distinct families. We notice that Aizoaceae is used instead of Ficoidaceae,

which is adopted by Hutchinson. This has alternatives in Tetragoniaceae of Link dating from 1831, and Mesembryanthaceae. The Family names Compositae, Umbelliferae, Labiatae, and Leguminosae, which are in general use, are retained. There is only one other exception to the family name ending in "aceae"—Guttiferae (which is also used by Hutchinson) and for which a name, following the general rule, might have been found or coined. Is it ascertained that *Salix caerulea* is a hybrid of *fragilis* and *alba* as stated on p. 10? The name, *Castanea vulgaris* is antedated by *C. sativa* Miller, but why not face the inevitable and write *Castanea Castanea* (L.) Karst. Does *Quercus Robur* grow in Scotland at an altitude of 1350 feet? Is not *Q. sessiflora* meant? We are glad to see that the genus, *Pyrus*, includes the *Sorbus* section. *Mespilus* is kept distinct and so are *Ulmaria* and *Filipendula*. *Laburnum vulgare* is antedated by *L. anagyroides*—here again *Laburnum Laburnum* avoids conflicting names. The Red Valerian is still spelt *Centranthus*, the older name being *Kentranthus*. The reader will find an immense amount of interesting matter packed in the pages, and we congratulate Dr Rendle with all his multifarious duties on being able to complete so important a work.

REYCHLER, LUCIEN. Concerning the Possibility of Provoking systematically among Plants (a) the Appearance of New Vital Phenomena, (b) Mutation. Results obtained with Cattleys by Crossing and by Mutation. Goemacre, Rue de la Limite, Bruxelles, 1926. In this somewhat polemic paper the author claims that he is able to fertilise the ovule of an *Impatiens* direct, without the pollen passing through the pistil, and that this artificial impregnation results in an instability being set up which causes many anomalous forms. So, too, with *Clevea* and with *Cattleya*. Ten beautiful figures of the latter are given. He contends that he can provoke mutation by producing and developing the plant individual (in the state of sexual elements or fecundated ovule) in surroundings different from those offered by nature. Burbank, the American plant breeder, wrote to him that—"Mutation and variations are heritable and generally form a starting point for numerous improved varieties, sometimes at once becoming fixed, at other times requiring very much attention for a long time for the raising of numerous seedlings to select from."

REYNOLDS, BERNARD. Whitby Wild Flowers. A Complete Botanic List of the Flowers, Grasses, and Ferns of the Whitby District (including Levisham and Scarborough, and Notes on their History and Habitats. Horne & Son, Whitby, 1925.

RUSSELL, Sir E. J. PLANT NUTRITION AND CROP PRODUCTION. pp. 115, with illustrations. University of California Press, Berkeley, California, 1926; 12/6. This formed the subject matter of the Hitchcock Lectures for 1924. These were established in 1909 for the purpose of giving the public the benefit of lectures on popular and scientific sub-

jects. In the Foreword Prof. W. W. Campbell says, "The appointment of Sir John Russell was agreed to . . . because the lecturer embodied in his personality the characteristic type of ability and industry which the agricultural science of this century represents. The distinction of his own contributions to the subject of plants in their relation with soils . . . assured for his lectures a degree of excellence which would commend them to all persons directly or indirectly interested in that field of work. These lectures have been so well received in California and other states of our country that the University of California feels itself honoured to be the means of making them available to the scientific and popular world. We congratulate ourselves on the opportunity of adding this tribute to the sterling character, ability, and industry of one of England's sons, to the praise he has won so abundantly in his own country and other lands." The work consists of five chapters:—The Study of Plant Nutriment; Positive Science and Exact Demonstration; Decay and the Living Plant: *Mors Janua Vitae*; The Soil Micro-organisms: can they be controlled and utilised; and The Soil and the Living Plant.

SALISBURY, E. J. The Influence of Earthworms on Soil Reaction and the Stratification of Undisturbed Soils. *Journ. Linn. Soc.* 417, 1926. Changes in the Hertfordshire Flora. A Consideration of the Influence of Man. *Trans. Herts. Nat. Hist. Soc.*, 1924. A valuable paper, in which the gradual lessening in frequency of our marsh plants is clearly shown to occur. In it it is mentioned that Dillenius introduced *Linaria Cymbalaria* from Italy to our Oxford Botanic Garden. That is not the case. It was in cultivation there as early as 1658 under the name *Cymbalaria italica*. Dr Salisbury mentions that the Box at Gaddesden, Bucks, was planted by the Duke of Bridgewater, and that Kalm noticed it there in his journey to England in 1745. The Effects of Coppicing as illustrated by Woods in Hertfordshire. *Trans. Herts. Nat. Hist. Soc.*, 1924.

SCHANTZ, H. L., and SAMPSON, A. W. FLORA OF UTAH AND NEVADA. Vol. 25. Contributions for the United States National Herbarium. 3700 species of flowering plants and ferns are included with key to the species and larger groups.

SCHINDLER, A. K. Leguminosae-Desmodiinae quoted in Ray's *Historia Plantarum*, Vol. iii. See *Journ. Bot.* 148, 1926. Ray added eight new plants to the seventeen species previously described. Of these eight only one was taken up properly by Poiret, and a second was erroneously identified by Linnaeus. The remaining six have been determined by Dr Schindler from the material extant at Oxford and the British Museum Herbarium.

SCOTT, DR DUKINFIELD. The Botanical Case for Evolution. See *Nineteenth Century* for February.

SEED TESTING. Report of the Fourth International Congress. pp. 227. H.M. Stationery Office, London; 12/6. At the meeting at Cambridge twenty-six countries were represented. Sir Lawrence Weaver, on behalf of the British Government, the Minister of Agriculture and Fisheries and the Council of the Institute, welcomed the delegates. Prof. R. G. Stapledon and Mr A. Eastham were the other English delegates. The Director of the Danish State Seed-Testing Station described the work of the Association from 1921-1924. It was affirmed that *Cuscuta Trifolii* is not found in Scotland. The seed-constituents of Red Clover from various geographical sources are very varied, and to them we doubtless owe the presence in our fields of *Ammi majus* and *Falcaria*. Danish Clover is conspicuous for its quantity of *Trifolium hybridum* and *Rumex Acetosella*. Dutch Red Clover has *Geranium molle* and *pusillum* in enormous quantities. In Roumanian Red Clover *Plantago lanceolata*, *Chenopodium album*, and *Medicago sativa* are preponderant. Swedish Red Clover showed *Phleum pratense* and *Trifolium hybridum* as the common weed-seeds. Extremely interesting details were supplied as to what seeds germinate after passing through the alimentary canal of animals. In Denmark 52% of seeds of *Solanum nigrum* that had passed through a cow germinated, 49% of *Stellaria media*, and 35% of *Polygonum aviculare*. An immense mass of statistics was quoted as to the loss of germinating power owing to age. The results were to me often unexpected. *Lycchnis Viscaria*, so often seen in Scandinavia, had a germinating power of 100% directly after harvesting, so, too, had *Geranium pratense* and *Hypericum quadrangulum*, whereas *Phleum pratense* had only 66%. Seeds of *Bromus secalinus* had 100% the first year, but after eight years ceased to grow. *Chenopodium album* had 64% the first year, but did not germinate after four years. *Brassica arvensis*, with its oily seeds, had its greatest percentage in its second year, i.e., 82%, but after 13 years only 13%. *Matricaria inodora*, that prolific seeder, ceased to grow after 12 years. *Carex inflata* only lasted 2 years, and while 47% of its seed germinated in the first year, in the second year it had sunk to 10%. Buried seeds of *Brassica arvensis*, says R. Dorph-Petersen of Denmark, germinated in the first year 77%, in the second year 81%, and in the seventh year had increased to its maximum of 94%, slightly sinking to 87% in the tenth and eleventh year, and to 17% in the eighteenth year. These results substantiate the popular idea as to the persistence of Charlock and to its appearance when a field—even a pasture field—has been brought into cultivation since the rolling seeds blown by the wind in dry weather drop down the cracks in the clayey soil. It may be added that the seed of Charlock stored in very dry places, starting with a germinating percentage of 82 in the first year, 91 in the second, and 89 in the third sank erratically but surely to zero in the fifteenth year. Dr A. von Degen gave an address on the Longevity of Seeds. He quoted an experiment of Giglioli who kept seeds in Oxygen, Nitrogen, Carbon dioxide, &c., for 16 years without their losing the power of germination. I once assisted Dr Romanes in a similar experiment, only dry Chlorine, Alcohol, Chloroform vapour and other gaseous substances

were used with Peas, Cereals, &c., which had been carefully sun-dried. Their germination was not affected after two years burial in hermetically sealed bottles, nor was it destroyed by immersion in liquid hydrogen. Degen believes *Nelumbium* to have the greatest longevity. *Cassia bicapsularis* germinated after 87 years. He thinks 150-250 years is the probable maximum of germinating power. The Congress was a great success. The next meeting is to be held in Rome.

SETCHELL, WILLIAM ALBERT. *Phytogeographical Notes on Tahiti*. pp. 240-324. University of California Publications, 1926. Both the Land and Marine Flora are discussed.

SHELFORD, VICTOR E. *NATURALIST'S GUIDE TO THE AMERICAS*. Publication Editor, Forrest Shreve; Botany, E. Lucy Braun; Forestry, C. F. Korstan and R. B. Miller. pp. c., 1800, 1926. Baillièrè, Tindall & Cox; 45/-.

SMALL, Prof. J. In *Trans. Bot. Soc. Edin.* 230, 1926, he describes a new genus of the Compositae, *Wardaster*, from the marshes of Yunnan-Szechuan. It grew at an altitude of 15,000 feet. The name is in honour of Capt. F. Kingdon Ward, who discovered it. The plant is allied to *Aster*, and it is extremely woolly. Professor W. Wright Smith and Dr Small have also described another new genus, *Parasenecio*, from the same district.

SMITHSONIAN INSTITUTION, of Washington, has in contemplation the preparation of a descriptive Flora of Central America. Recently Dr Paul C. Standley has investigated Costa Rica and has made a collection of nearly 12,000 plants. He is preparing a Flora of that country.

STANFORD, E. G. *Polygonum pensylvanicum* and Related Species. *Rhodora* 27, 173, 1925. Also the amphibious group, *l.c.* 100-112, 1925. Of *amphibium-natans*, *terrestre*, and var. *maritimum* are recognised.

STILES, WALTER, Sc.D. *PHYTOSYNTHESIS: THE ASSIMILATION OF CARBON BY GREEN PLANTS*. pp. vi., 268. Longmans, Green & Co., London, 1925; 16/-. In this book an attempt is made to fill up one of the existing gaps by presenting a comprehensive survey of the subject of Phytosynthesis. It is intended primarily for students reading for University degrees in which Botany is a subject, and for research students, but it is hoped that it will appeal also to the general botanical public as well as to chemists and physiologists. Packed closely in these pages are chapters on The System Involved and on The Assimilatory Pigments. Chlorophyll was named by Pelletier and Caventou in 1811, but it had been extracted from leaves by Grew in 1682, who, at that early date, indicated that there might be more than one coloured substance in the leaf. The Demonstration of Phytosynthesis, its Measurement, the Entrance of Carbon Dioxide into the Assimilatory Organs, the Influence of External and Internal Conditions, its Products, Utilisation of Energy in its

Mechanism, and Relation to other Plant Activities are all treated with great ability and with that caution which marks the scientific mind. The Professor of Botany of the University of Reading has produced a work which will be of real service to the students, while its comprehensive bibliography of 870 references will ensure its finding a place on the shelves of most botanists. Messrs Longmans, Green & Co. have produced this book in a very attractive guise.

SUTTON, MARTIN H. F., in collaboration with D. J. COLUMBUS JONES. Red Clover and the Possibilities of Improved Strains by Breeding. Bulletin n. 14, pp. 32, 1926; 2/6. The authors remind us that in England and Wales the area under Grasses and Clovers reaches the high figure of 17,498,000 acres, so that there is a high incentive to produce such strains as will give a heavier yield. From the details given, it seems that the "Cornish Marl" and "Yellow-seeded" have a higher ratio of true protein than the "Wild Red" which may explain its supposed less nutritive value. Diagrams are given showing the structure of a red clover flower and very excellent details respecting its pollination are supplied. The pollen is said to be very susceptible to moisture so that a wet season is inimical to a large yield.

SUTTON & Co. Plant Breeding and Research in Grasses and Clovers. pp. 32, 1926. This gives the Principles and Methods for the Improvement of Grasses and Clovers. Of the latter one of the most practical results of the plant-breeder's work has been the discovery that the seeds of many clovers produced in this and other countries exhibit a remarkable degree of variation. The English "Red" and Sutton's "Yellow-seeded" have both proved very valuable. Among the late-flowering Red Clovers are "English Single-cut," "Montgomeryshire" and "Cornish Marl." Efforts are being made to separate and isolate the more valuable types of the Wild Red Clover which is the earliest to flower. *T. fragiferum* is proving very valuable not only in England but in New Zealand, especially in wet swamps and tidal regions, also in parts of Australia. The Creeping Fescue (*Festuca arenaria*) is said to be more creeping and denser in habit of growth than several of the other varieties.

SUTTON & SONS. THE CULTURE OF VEGETABLES AND FLOWERS FROM SEEDS AND ROOTS. Seventeenth Edition. pp. 462. Simpkin, Marshall, Hamilton, Kent & Co., London, 1926; 7/6. The contents include chapters on The Culture of Vegetables, A Year's Work in the Vegetable Garden, The Rotation of Crops in the Vegetable Garden, The Chemistry of Garden Crops, Artificial Manures and their Application to Garden Crops, The Culture of Flowers from Seeds, The Culture of Flowering Bulbs, Flowers all the Year Round, The Pests of Garden Plants, and The Fungus Pests of certain Garden Plants and of certain Flowers. The book is written in a wholly optimistic manner on the advances in horticulture during the last half century and few, if any, firms have

helped forward this progress more than the celebrated Reading seedsmen. Therefore any suggestions made in this book will, we know, be good since they are the outcome of educated experience. The treatment of the Globe Artichoke, Asparagus, Jerusalem Artichoke, the Broad Bean (said to be one of our most profitable garden crops), the Beet (which is most highly commended), Broccoli and Cabbages of that ilk, Celery, including the Turnip-rooted Celery or Celeriac with its root knob, sometimes five pounds in weight, Chicory, Cucumber, Herbs, Melon, Mushrooms, Onions, Garden Peas, Potatoes, Sea Kale, Spinach, Strawberry, Tomato, Turnip and Vegetable Marrow are among others which are dealt with in a masterly manner. Advice is given on the use of Artificial Manures. A list of plants most fitted to be propagated by seed is included. In fact, there is hardly a garden problem which is not satisfactorily answered in these pages. That it has reached its seventeenth edition is a proof not only of its value but of how much that value is recognised.

THELLUNG, Prof. ALBERT. UMBELLIFERAE. In *Illustrierte Flora von Mitteleuropa*. Edited by Dr Gustav von Hegi. pp. 926-1537. Band v (2). In this copiously illustrated and well printed Monograph our honorary member has most capably treated of an important Family. We are glad to see that the generic limitations are closely akin to those adopted in our *List* and that they have practically identical species. The generic sequence, too, is fairly approximate. The main differences are that the "nomina conservanda," rather than the oldest names, are used—*Trinia* 1819, not *Apinella* Necker of 1790; *Falcaria* 1800, vice *Prionitis* 1763; *Bifora* 1816, rather than *Anidrum* 1790, and that the following genera have different limitations in Engler and Prantl—authors in the main followed by Dr Thellung from those of Bentham and Hooker, the latter authors combining *Pastinaca* and *Anethum* with *Peucedanum*, *Torilis* with *Caucalis*, and *Orlaya* with *Daucus*, while *Petroselinum*, *Bunium* and *Carum* are retained as distinct genera by Dr Thellung instead of being combined under *Carum*. There is much to be said for either method. Any one who is acquainted with Dr Thellung's meticulous care and intimate knowledge of the plants he treats of would expect that a first-class piece of work would be produced, and one can at once say that the results are eminently satisfactory. There is a wealth of information given about each species. The text figures and the reproduced photographs of plants *in situ* are alike excellent. Take, for instance, that of *Torilis arvensis* (measuring 4 in. × 2½ in.) where a life-like figure of the plant is given with details of the flower, fruit, and its section. That of *Chaerophyllum aureum* is equally satisfactory. Of *Sanicula* a photographic reproduction (3¼ in. × 2¼ in.) excellently characterises the plant. The geographical distribution is most comprehensive and is often illustrated in a map showing the area of the plant's occurrence. Mr Sprague has pointed out that *Cerefolium* rather than *Chaerofolium* should be used—it precedes *Anthriscus* of Persoon. Fabricius in 1789 also employed it, and it was used in my Berkshire Flora. (Dr

Thellung still holds to his views.) *Oenanthe fluviatilis* is given from West Jutland, Lothringen and Deutsches Oberheingebilt; the form *terrestris* Glück which was found by Glück at Oxford is also mentioned. Under *Aethusa Cynapium* the vars. *domestica* Wallr. (*hortensis* Boenn.) and *agrestis* Wallr. are described. *Silaum* Mill., 1754, is used in place of *Silaus* Bernh., 1800, and a name, perilously close to a duplicated binomial, is used—*Silaum Silaus* S. & T. One notices that *decurrens* Avé-Lall. of *Angelica sylvestris* is put under the var. *elatior* of Fritch. There are delightfully executed figures of the varieties of leaf form in *Heracleum* but Dr Thellung uses sub-var. *stenophyllum* (Gaud.) to cover var. *angustifolium* Huds., which has a confused synonymy. *Laser trilobum* is used instead of *Siler* for the alien plant at Cherry Hinton, which is now extinct. It had no more right to a place in our flora than the Sequoia. *Siler* Miller, 1754, has *S. montanum* (*Laserpitium montanum*) for its type. There is an excellent Key to the genera occupying 11 pages and a good index. Would that such a comprehensive work on our large English Plant Families were available!

THELLUNG, A. Die Linnéschen *Daucus*-Arten im Lichte der original-Herbariumplane. Fedde Repert, 305, 1926. Under *D. Carota* L. he has sub-sp. *maximus* (Desf.) Th. (*D. mauritanicus* L. Sp. Pl. 1763 nom. conf.); sub-sp. *Bocconeii* (Guss.) Bonnier; sub-sp. *commutatus* (Paul.) Th.; sub-sp. *hispanicus* (Gouan) Th.; sub-sp. *Fontanesii* Th. (*hispidus* Desf. non Mill.) and sub-sp. *gummifer* Th. (*gummifer* Lam.)=*maritimus* With. non Lam.

THE NEW PHYTOLOGIST. Edited by A. G. Tansley, M.A., F.R.S. Vol. xxv.; 25/-.

THURSTON, EDGAR, and VIGURS, C. C. Note on the Cornish Flora in Journal of the Royal Institute of Cornwall. pp. 99-112, 1926. A useful addition to the Flora of Cornwall. Incidentally one may suggest that *Erysimum orientale* Mill. is used in error for *Conringia* (or *Erysimum*) *orientalis* Dum.; that *Geranium Endressii* Gay is a good West Spanish species and not a form of *striatum*—itself a name antedated by *versicolor* L., and that *Axyris* is the name, not *Oxyria*. The former is a Chenopodiaceous, the latter a Polygonaceous genus. It is very gratifying to find that such excellent attention is paid to the Flora of the Duchy by Mr Thurston and his helpers.

TRELEASE, WILLIAM. THE AMERICAN OAKS. Mem. Acad. Sci., Washington. pp. 225, tt. 420, 1924. 51 hybrids are admitted for the U.S.A., and 371 species of which one half are now figured for the first time.

UNITED STATES DEPARTMENT OF AGRICULTURE, Washington. Seeds and Plants imported by the Office of Foreign Plant Introductions. Bureau of Plant Industry. From October 1 to December 31, 1923, 434 species were introduced. The paper is not a mere skeleton of names but has details of a most useful kind. Every page has some fascinating points.

Thirty-seven plants of the genus *Berberis* were introduced for pathological purposes. The root of Master Wort, *Peucedanum Ostruthium*, is said to be used to flavour some of the Swiss Cheese, and *Rumex alpinus* is eaten like spinach—let us hope not by gouty patients. The Farmers' Bulletin, No. 1496, treats of the Inoculation of Legumes and non-Legumes with Nitrogen-fixing and other Bacteria. Figures of the Alfalfa and Soya Bean Nodules, among others, are given. A luminous engraving of a field of Vetch, one half inoculated with bacteria, the other not inoculated shows an extraordinary difference. No. 1468 treats of Muskmelons. In the U.S. 82,000 acres are devoted annually to their growth and the produce is about 32,000 standard freight cars=11,000,000 crates, California and Colorado being the chief sources of supply. A large number of varieties are grown and are well figured. The diseases and insects which attack them are mentioned and remedies suggested. Nos. 1481 and 1482 deal with Roadside Tree-planting in which the best trees for certain localities are suggested and illustrations given. The 85 pages give a mass of most useful information. Would that a similar brochure might be published for Great Britain where our highroads will soon be like the permanent way of a railroad!

VOIGT, ALBAN. Additions to the Flora of Tessin. Viert. Nat. Zurich 71, 1926.

WALES, NATIONAL MUSEUM OF. A Pamphlet issued in 1926 describes some of its contents and its aims and needs. One has nothing but praise for the energy and ability with which this Museum is being planned and propelled. Finely situated and of a novel and pleasing exterior, the interior is being gradually filled with objects of great interest and value. The Department of Botany is a live-wire, and under its able management is becoming of great value. The Herbarium of the late Mr J. A. Wheldon has recently been acquired (10,000 sheets); there are 23,000 packets of Mosses and over 10,000 foreign specimens. The beautiful paintings by Henry Drinkwater include 385 Welsh specimens. We wish every success to this splendid institution and members might assist by sending well-preserved specimens of Welsh plants. The Nineteenth Annual Report for 1925-26, pp. 50, has a good illustration of the stately building. The British Flowering Plants and Ferns now number 38,100, and Mosses, Liverworts, &c., about 45,000. The foreign specimens number about 15,000. The Library has been supplemented by 850 volumes and pamphlets. In twelve months the Museum was visited by nearly 150,000 people. The List of Donations is large and valuable and the illustrations of some of these are very good.

WEBB, J. A., B.A. In the Caithness local paper our member has published a valuable List of Caithness Plants and contrasts the flora with that of Glamorganshire. He says 1600 alien plants have been listed for the Welsh County. We notice that *Fritillaria*, *Colchicum*, *Crocus vernus*, *Hypericum Androsaemum* are included in the Caithness list. Of these one would be glad to have particulars. Mr Manson re-

cords *Astragalus alpinus*. If correctly identified this would be a splendid discovery. There are some omissions. Among them are *Euphrasia septentrionalis* recorded and described in *Rep. B.E.C.* 298, 1921, and *Habenaria viridis*, var. *ovata* Dr.

WEIR, JAMES E. A Pathological Survey of the Para Rubber Tree (*Hevea brasiliensis*) in the Amazon Valley. U.S.A. Dept. Agric. Bulletin 1380, pp. 129, 1926. One of those useful treatises for which the Department is celebrated. It is as thorough as it is concise.

WILD FLOWER MAGAZINE. This popular society, of which this is the organ, is conducted with zeal and energy by Mrs Dent of Flass, Maulds Meaburn, Penrith, assisted ably by Lady Davy, Mr N. Sandwith, Miss Mason, Miss Brown, Miss V. Dent, Miss Tucker, Miss Maude Robinson, Miss Hilda Salmon, Miss L. C. Richards, Mrs Imrie, and Mrs Godden. Lord Ullswater contributes a paper on "The Preservation of Wild Flowers" and concludes by saying, "If we can once realise that in cutting off a 'treasure' we are depriving somebody of a pleasure which we have enjoyed we shall think twice and thrice before committing this act of selfishness." Mr C. B. Tahourdin writes in the same strain. The Dean of Gibraltar has an article on "The Flora of Gibraltar," which gives a good account of a delightful bit of botanical country which was so closely studied by Col. A. H. Wolley-Dod. It has several special treasures, to wit *Iberis gibraltaria*, *Saxifraga globulifera*, *Silene gibraltaria*, and *Cerastium gibraltarium*. 587 species have been noted. There are several confusing misprints. *Elutorum* should be *Elaterium*. Does *Phohine* mean *Phlomis*? The paper will prove useful to one visiting Calpe. Miss G. Bacon, who we are so glad to see in restored health, has two racy articles on Chenopods and Brassicas.

WILD FLOWERS, POPULAR. "The Observer" in July last concluded a Competition among its readers on the most Popular Wild Flowers. The Primrose stood first with 982, then followed the Bluebell 839, Wild Rose 789, Violet 686, Honeysuckle 574, Cowslip 439, Buttercup 355, Daisy 235, Heather 134, Foxglove 137, Gorse 15. Oddly enough the Hawthorn and Anemone only received 39 votes, while the Blackthorn, Mimulus, Crocus and Dandelion had one vote each.

WILSON, ERNEST. The Rhododendrons of Eastern China, the Bonin and Liukiu Islands. Journ. Arnold Arbor. 156-186, 1925. Three new species are included.

WOODWARD, MARCUS. THE NEW BOOK OF TREES. Illustrated with wood engravings by C. Dillon M'Gurk. pp. 309. A. M. Philpot Ltd., 69 Great Russell Street, W.C.1; 12/6 net. The publishers say "This unique tree-book by 'the modern Richard Jefferies' is the most complete yet published. Every chapter begins with a short botanical note, which is followed by the historical and romantic story of the tree, illustrated with references in English literature. Thus it will appeal alike to botanist, country squire, student of folk-lore, and the simple lover of nature.

The striking woodcuts reproduce the essential character of each tree, while the numerous pen-and-ink drawings give the details with admirable fidelity." There is much to be said for this, not altogether unbiassed, encomium. The author in his preface quotes from Oliver Wendell Holmes, "Now, if you expect me to hold forth in a scientific way about my tree-loves—to talk, for instance, of the *Ulmus americana* and describe the ciliated edge of its samara and all that . . . I must refer you to a dull friend who will discourse to you on such matters. What tree lovers want is the meaning, the character, the expression of a tree, as a kind and as an individual." Therefore the botanist, the ordinary taxonomist, must not expect to find great assistance in defining the species described. The oak is said to have two varieties "which Linnaeus recognised above a hundred and fifty years ago." He did not mention them in the "Species Plantarum," but he gives one of them, as an unnamed variety, in the "Flora Suecica" of 1755, and yet omits it from the "Species Plantarum" of 1763, but that is by the way. The author gives the essential differences between the two species, for they surely deserve that grade. He alludes to the "down" on the under side of the leaves of *sessiliflora*, this down really consisting of persistent multiple or bifid hairs, while in *Robur* the leaf undersurface is glabrous. Under the Birch the two species *alba* and *pubescens* are designated as forms. Trees of 70-80 feet often occur, although 50 feet is given as the limit. Under the Elm the Common or Small-leaved Elm, *U. campestris*, is said to be a "native of North America and Siberia, and has been established in Britain since the days of the Roman occupation, but it is by no means certain that it was introduced by the Romans." Is there any evidence that it is a native of North America or Siberia? In the case of *U. montana* the author is more cautious, as he says it is "believed to be a native of Scotland." Does any one doubt its being indigenous in Britain? No reference is made to the Eastern County Elms, nor is there any mention of the commonest Poplar in Britain. But the book is in the main designed for the use of those readers who are not dull botanists, and under each tree is massed much matter of a popular and pleasing kind, which has been well selected. The groups chosen are Woodland Trees—Oak, Beech, Ash, Sweet Chestnut, Birches, and Rowan; Hedgerow Trees—Elms, Poplars, Sycamore, Maple and Hornbeam, and there are 18 species of Small Hedgerow Trees and Shrubs, 12 of Park and Garden Trees, and 18 Coniferae. There are also descriptions of Plane, Tamarisk, Alder, and Willows. The book is well and attractively printed on light unglazed paper and is copiously illustrated. The woodcuts are too modern to appeal to a dull fossil like myself. They do not recall any trees familiar to me, so that it is not familiarity which breeds contempt. Doubtless a younger and better informed generation may delight in them, or in guessing what they represent. That the book will have an extensive sale is quite certain and the general reader will be repaid by the large amount of interesting material which it contains and will be especially grateful for the references to the old village industries connected with timber—such as the Buckinghamshire Beeches.

## OBITUARIES.

BATESON, WILLIAM. Born at Whitby in 1861; died, from heart failure following bronchitis, at Merton, February 8, 1926. He was the son of the Rev. Dr W. H. Bateson, Master of St John's College, Cambridge. Educated at Rugby, he entered his father's college and took the Natural Science Tripos in 1882-3. Stimulated by the genius of Francis Balfour he took up the study of comparative embryology as Balfour student 1887-90, and definitely fixed the position of *Balanoglossus*. He was elected Fellow of that College in 1885. He travelled widely, visiting Siberia and Central Asia, especially to study variations, and on this subject he was led to adopt the idea of discontinuity rather than that of a continuous process. In the brilliant preface to his "Materials for the Study of Variation," he declared that "nature far from jogging along the evolutionary way by imperceptible paces, is of a more joyous habit and is always apt to skip and jump." Here he predicted would be the starting point of the evolution of new species. This brought him into conflict with the more orthodox evolutionists, and in the discussions he did not always come off second best for he was a vigorous debater and carried the war into the enemy's country with a forceful energy. The results of his studies into what variations did actually occur are to be found in his "Materials for the Study of Variation," published in 1894. The rediscovery in 1900 by De Vries of Mendel's Law, which the Abbé had published in 1866, was eagerly seized upon by Bateson, who became one of the most ardent disciples of Mendelism. In 1902 he published "A Defence of Mendel's Principles of Heredity," in which he countered Professor Wheldon's objections. He was President of Section D, Zoology, at the Cambridge Meeting of the British Association, and gave a vigorous address. In 1906 he was Professor of the International Conference on Genetics, a happy word coined by him, and as a practical outcome of his work a Chair of Biology at Cambridge was founded in 1908, of which he was the first Professor. In 1909, while still holding the chair at Cambridge, he published "Mendel's Principles of Heredity." In 1910, shortly after its publication, he took up his residence at Merton, as Director of the John Innes Horticultural Institution, where he made a name and enriched the subject of his study with many discoveries. For many years he was one of our distinguished members, and I owe much to him for ever readily rendered assistance. In the fateful year 1914 he was President of the British Association Meeting in Australia, and I heard his Presidential Address. It was given in two parts, one at Melbourne and the other at Sydney. For the first time lantern slides were used. Unfortunately, as the room was a large one, the lanternist was at a great distance from the President. Many of the slides were put in in the wrong order, and this so disconcerted Bateson that it made him almost literally tear his hair as he marched up and down the platform, but his address was of marked ability. "Species-mongers," as

some derisively call those who have a clearer conception of what a species is than the "lumpers" whose pigeon-hole receptacles, which in many cases represent the Linnean "species," hold most discordant elements as, for instance, the Linnean *Orchis latifolia* or *Serapius longifolia* or the Benthamian *Carex distans* L. The "splitters," the "Hieraciarchs," "Taraxacologists" and "Batalogists" must have been much encouraged when Bateson took up the cudgels in favour of the true breeding forms. He said "Jordan was perfectly right. Those which he distinguished in such multitudes are real entities, though the great systematists, dispensing with such laborious analyses have pooled them into arbitrary Linnean species [scarcely less artificial than his system] for the convenience of collectors, and for the simplification of catalogues. Such pragmatism consideration may mean much in the museum, but with them the student of physiology of vegetation has nothing to do. These 'little species,' finely cut, true-breeding, and innumerable mongrels between them, are what he finds when he examines any so-called variable type. On analysis the semblance of variability disappears, and the illusion is shown to be due to segregation and re-combination of series of factors on pre-determined lines. As soon as the 'little species' are separated out they are found to be fixed." Honours came thickly on Bateson. He was Fellow of the Royal Society, Hon. D.Sc. of Sheffield, Melbourne and Perth, twice vice-president of the Linnean Society, and was chosen President of Section K of the British Association for the Oxford Meeting in 1926. Owing to his lamented death his place was occupied by Professor F. O. Bower, who headed his address with one of Bateson's sentences from the Birkbeck Lecture of 1924—"The Future of Biology lies not in generalisation but in closer and closer analysis." This more chastened attitude is expressed when Bateson says "we must frankly admit that the Mendelian analysis has not given us the origin of species." As Professor Bower so well expressed it, "Bateson's latest public pronouncements may suggest to you what the Section has lost by his death. They show a mind still elastic and perceptive: still both constructive and critical." Botanical Science is the poorer from the death of a notable figure, a real worker, and a strong and vivid personality.

**BURBANK, LUTHER.** Born at Lancaster, Mass., in 1849; died at Santa Rosa, California, April 11, 1926. His early days were spent on a farm, and in 1875 he established an experimental farm at Santa Rosa. Unfortunately the "energetic press" took him and claimed for him a knowledge of plants outrivalling Solomon, and made him a creator of new products such as no finite person has yet accomplished. The result was that his great services to horticulture were discounted, and such products as his super wheat with its high percentage of gluten, his Wickson Coreless Apple, his Stoneless Plum, and many other wonderful productions are apt to be forgotten or mistrusted.

**CHEESMAN, WILLIAM NORWOOD.** Born at Winterton, N. Lincs., 1847; died at Selby, November 7, 1925. He was a J.P. for the West Riding of Yorkshire, and a member of the Yorkshire Archæological

Society. He joined the Linnean Society in 1903 and was President of the Yorkshire Naturalists' Union and of the British Mycological Society. Cheesman was a recognised authority on the Mycetozoa, and wrote on the Mycology of South Africa (*Journ. Linn. Soc.* 408, 1907) and of the Rocky Mountains (*Trans. Brit. Mycol. Soc.* 267, 1911). He recently made a gift of £100 to the British Mycological Society. For many years he had been a member of our Society and I saw much of him in Australia on the occasion of the visit of the British Association. On his gatherings there and in New Zealand, see papers by him and Miss Lister in *Journ. Bot.* 203, 1915. He was a prominent Freemason, and wrote some erudite papers on the subject.

CRYER, JOHN. Born at Charlestown, Baildon, Yorks, 1860; died at Bradford, May 7, 1926. He first worked at the Saltaire Mills, and at 13 went to St Paul's Church School where he became a teacher. He was connected with that profession for upwards of 50 years and did yeoman service in the cause of education. He sat on the Board of the Governors of Salts' Schools, Shipley, from 1891-4, and was chosen as the Teachers' Representative. He was elected to the Bradford School Board in 1894. Three years later he headed the poll with a 5000 majority. He was much interested in school gardens and became an Inspector of Science and Superintendent of Gardening under the Education Authority. For forty years he explored the highways and byways of Yorkshire, and he possessed a real knowledge of its flora. He distinguished himself by discovering a new locality for the milkwort, *Polygala amara* L., var. *alpina* (*P. Amarella*). He specialised in the Hieracia of which he prepared very beautiful herbarium specimens. On this subject he was our acknowledged expert and the Club is under great obligations for his ungrudging help. It was always a pleasure to add his specimens to one's herbarium. I noticed that having once put his specimens into drying sheets he did not often change the paper of which he used a large quantity. He kept them under considerable pressure. I often wondered at the absence of mould. He was very interested in the adventive flora, and about Bradford he is said to have found 500 alien species, several of these being additions to our adventive list. He took me to the best of these areas, and one was deeply gratified to see "these nurslings of another sky" looking so completely at home. Among his additions were *Cucumis myriocarpa*, *Amaranthus Thunbergii*, f. *maculatus*. From 1914 to 1918, Mr Cryer taught Botany at the Technical College. He acted as Editor and Distributor of the Exchange Club in 1912, when the then largest number of plants, 8656, were sent out, of which he sent no fewer than 606 of his own collecting. In the *Report* 719, 1919, he contributed a paper on the Adventive Plants of Bradford, which included many interesting species. In 1924, on his completion of 50 years of educational work, a great tribute was paid him in the local press. Personally, Cryer was a fine type of man, with a pleasant manner and with a broad outlook on men and things. He is a great loss to the Exchange Club—such men as he are difficult to replace. His Herbarium has been acquired by the University of Leeds.

DRINKWATER, Dr HARRY. Born at Northwich, 1855; died at Wrexham, July 11, 1925. He was educated at Durham and at Edinburgh, of which he became M.D. in 1885, winning a gold medal. Of considerable scientific attainments he received in 1911 the Johann Gregor Mendel Medal at the Fourth International Conference on Genetics at Paris. He was a Fellow of the Royal Society of Edinburgh and President of the Chester Society of Natural Science from 1915-20. See *North West Nat.* 40, 1926. He received the hon. degree of M.Sc. from the University of Wales in 1924. To this University he presented about 400 paintings of British Plants which are well executed and are faithful representations of the species. Many of them are painted on brown paper and the coloured figures are vivid and life-like. In 1924 he published "Fifty Years of Medical Progress," and had in hand a huge work on Medical Biography.

DULEEP, Prince FREDERICK SINGH, M.A., M.V.O., F.S.A. The son of the Maharajah Duleep Singh of Lahore, he was born in London on January 23, 1868. He was educated at Eton and Magdalen College, Cambridge. He served in France from 1917-1919. He was much interested in archæology, gardening, music and history. He had made a considerable collection of historic paintings which he has left to Norfolk. Having made His Highness's acquaintance at Blenheim, one found he was much interested in trees and shrubs. Last year he entertained some of us on one of our meetings at his old-world mansion at Blo Norton, when his own fen-land was explored and the rare *Liparis* seen in flower, Unfortunately he had a cerebral seizure the previous year and with that shadow hanging over him he had to relinquish many of his interests. The end came all too soon. He was of a thoroughly kind disposition and had gained the respect and affection of a large circle of friends.

FAWCETT, WILLIAM. Born at Arklow, Co. Wicklow, Ireland, February 13, 1851; died suddenly at Blackheath, August 14, 1926. See *Journ. Bot.* 310, with list of his publications. Educated at Dulwich College he became for a time a member of the scholastic profession by teaching in a private school in Kent, but he decided to take up botany and studied at King's College, where he obtained his B.Sc. in 1879. He then entered the Department of Botany at the British Museum and remained there until 1886 when he was chosen to succeed Daniel Morris as Director of Botanic Gardens and Plantations in Jamaica. There he did excellent work, and in 1893 published "A Provisional List of the Indigenous and Naturalised Flowering Plants of Jamaica," founded on Grisebach's "Flora of the British West Indies." He retired in 1908, and again became connected with the Herbarium at the British Museum. There, in conjunction with Dr Rendle, "The Flora of Jamaica" was prepared, of which five volumes have been published, the last volume being issued shortly before his death. It completed the free-petalled Dicotyledons. Volume 2 has not yet been published. Any visitor to the British Museum Herbarium must recall his quiet assiduity. He did much

to encourage the economic side of Botany in Jamaica and wrote a useful book in 1914 on "The Banana: its Cultivation, Distribution, and Commercial Uses."

FOX, PREBENDARY HENRY ELLIOTT. Born at Masulipatam, S. India, October 21, 1841; died at The Croft, Lytton Grove, Surrey, 1926. He was educated at Harrow (Mr Vaughan's House) and Trinity College, Cambridge, taking in 1864 a third-class in Classical Tripos. He entered Lincoln's Inn in 1864; but he had been interested in Church work, especially foreign missions, so he joined the Church, being ordained by Samuel Wilberforce. He became curate at S. Ebbe's, Oxford, in 1869; vicar of Christ Church, Westminster, in 1873, and then of St Nicholas, Durham, in 1882. From there he joined the Church Army and did excellent work in Madras along with eight others. He was Honorary Secretary of the Church Missionary Society from 1895 to 1910, and was the author of several religious works. When at Oxford he made the acquaintance of Prof. Lawson. Being much interested in British Botany he accompanied Prof. Lawson and Prof. D. Oliver to Skye in 1868, and a list of their discoveries was published in *Journ. Bot.* 108, 1869. The list numbers 339 species, of which 51 were said to be additions to the flora of the Inner Hebrides. One may say that the *Cerastium alpinum* of the list was *C. nigrescens* (but the true *alpinum* has since been found there) and the *Orchis latifolia* was *O. praetermissa*, var. *pulchella*. In 1890 Mr Fox went to Palestine where he held special services for the congregations in Jerusalem. He collected plants there with assiduity and a warm testimony to his help is accorded by Post in his "Flora of Palestine." Many of his plants are preserved at South Kensington. In 1901, the Bishop of London appointed him to the prebend of Holborn, in St Paul's Cathedral. He lived at The Croft, Lytton Grove, a large house once occupied by an eminent judge. There he had a spacious garden and a considerable and well-arranged Herbarium. This before his death he was good enough to give me. It has many plants from Cornwall, Surrey and especially from Durham and Scotland, but it is unexpectedly weak in critical species. He was one of our oldest members, having joined in 1867. In that year he sent to the Club *Cuscuta hassiaca*, which he and Lawson had found at the Cambridge Railway Station, and in 1868 he sent *Epilobium anagallidifolium* from Skye. In 1885 he accompanied Hanbury to Caithness and Sutherland and the results of their visit are given in *Journ. Bot.* 333, 1885. He also collected many plants on the Continent, but his Japanese collection, which he had given to a local museum, was, I am told, destroyed owing to bad storage. His European collection is also in my possession, and he was kind enough to give me his copy of the first edition of Sowerby's "English Botany" and many local floras. He was a man of fine presence, an earnest preacher, and of a kindly disposition. He was thrice married, and leaves a widow, son, and five daughters. One of his sons died as a missionary at Kano, West Africa. As one has said, his herbarium was a large one and contained many rare species. As our pages show, it contained a sheet of four specimens of

*Botrychium* from Kincardine, collected by T. Sim in 1876, and labelled *Lunaria*. Three were *Lunaria*, but one is *matricariifolium* (= *rutaceum*) At present only a portion of the collection has been critically examined. His death leaves a sad blank in our membership; to myself it is a great personal sorrow.

GAINSBOROUGH, CHARLES WILLIAM FRANCIS NOEL, THE THIRD EARL OF. Born October 20, 1850; died 1926. He was educated at Oscott and served in the 10th Hussars, succeeding to the Earldom in 1884. He became Lord Lieutenant of Rutland. He was twice married, first to Augusta Berkeley of Spetchley, a connection of the Rev. M. J. Berkeley, who probably gave him a taste for botany. His second wife, Miss Dease of Westmeath, by whom he had five children, survives him. For some years he was a member of our Society and was keen on seeing British plants in flower from year to year. I had the pleasure of showing him *Gagea*, *Aristolochia* and some of our Oxford rarities, and in return he showed me *Linum perenne* at Great Chesterton near Stamford. Although a visit to Exton Park was proposed, I could never find time to avail myself of it. He was greatly interested in our *Reports*, and gave me the first record of *Montia* for Rutland. For some time he had been a great invalid.

GUPPY, HENRY BROUGHAM, F.R.S. Born at Falmouth, 1854; died at Martinique, April 23, 1926. The son of T. S. Guppy, M.D., he was educated at King's College, Sherborne; Queen's College, Birmingham, and Edinburgh University. He served in the Medical Service of the Royal Navy from 1876-1885, being Surgeon on H.M.S. "Hornet" on the China and Japan Station from 1877-80, and on H.M.S. "Lark," which was commissioned for survey work in the Western Pacific from 1881 to 1884. He made a close investigation of the coral-reefs on the Keeling-Cocos Islands and Western Java. Upwards of twenty islands and islets were examined by him. (See *Nature* 39, 286, 1889.) He concluded that the small atolls and horse-shoe islands only assumed their form after their emergence, thus challenging, and not unsuccessfully, Darwin's suggested theory of submergence. He contributed a paper on plant dispersal as shown by these islands to the *Journ. Vict. Inst.* in 1890. In 1903 in a physical and geological monograph on Vanua Levu, one of the Fiji group, he describes the building up on a submarine basaltic plateau of the reef-formation of that island. He published two volumes on the Solomon Islands and two on the Fijis and Hawaiis. In 1892 he read a paper on "The River Thames as an Agent in Plant Dispersal" before the Linnean Society, and two years later one on "The Habits of the three species of *Lemna*." This led to our acquaintance. But it was in Plant Dispersal that he had the greatest interest, and it was in this subject that he gained his brightest honours. For this his wide and thorough investigations in the Pacific gave him a full equipment of facts, and this is evidenced by his work on "Plant Dispersal" issued in 1906. *Inter alia*, the great Pacific land-area, which had been

suggested, receives no support from him. In 1917 he published the results of his investigations in "Plants, Seeds and Currents in the West Indies and Azores," which is a valuable addition to our knowledge of the floras of these islands, especially of the island of Pico, of which he made a detailed flora. He was elected to the Royal Society in 1918, and was also a recipient of the Linnean medal. Mr Guppy's work was of a high order, marked with most patient industry in accumulating facts. Even if he had done no more his life would have been amply justified, but he had the higher gift of being able to gather from his well arrayed mass of facts visions of arrangements in what might have been meaningless occurrences, so as to predict, with great probabilities, the results of Plant dispersal which have so influenced the floras of the world. His death leaves our Society immeasurably poorer from the absence of such an original and acute a mind.

HACKEL, EDUARD. Born at Haida, German Bohemia, March 18, 1850; died at his home at Attersee, February 17, 1926. After preparing at the Realschule, 1859-65, he went to The Polytechnic High School at Vienna, where he obtained his diploma, and then to St Polten, where he taught in the Realschule till 1900, when he retired and took up his residence at the beautiful Attersee. He elaborated the Gramineae for Engler and Prantl's "Die Naturliche Pflanzenfamilien," an extraordinarily clever piece of work, which he finished in 1889. The English translation appeared in 1896 as "The True Grasses." Prior to this, in 1882, he published the "Monographia Festucarum Europaeorum," an extremely able and critical work. In 1891 he brought out his "Monograph of the Andropogoneae," which Dr Stapf calls a masterpiece of descriptive botanical literature. His last work was a continuation of "Gramineae Novae" in Fedde's "Repertorium" of 1893. For many years I was in frequent correspondence with Professor Hackel who, with unrivalled patience, determined the grasses for our Club, of which he was an Honorary Member. The grass which I sent him as *Bromus mollis*, nov. var. *aggregatus*, he was much delighted with, and I asked him to name and describe it, which he did as var. *interruptus*. In after time, when its split pales proved to be a constant character, he fully agreed to my naming it as a species. He also named var. *scotica* and var. *laevis*, two varieties of *Agrostis canina*, one from Ben Eay, the other from the summit of Brandon Mountain in Kerry. The former at first led me to think I had got *A. rubra*. Indeed, writing from St Polten in 1889, Hackel said:—"Your *Agrostis* is in some degree intermediate between *A. canina* and *A. rubra*. Such intermediates have been mentioned by Berlin (Others Stockh. For. 76, 1887), but he gave no name to any of them. I should like to name your *Agrostis A. canina*, var. *scotica*. Like true *canina* it offers two sub-varieties, *aristata* and *mutica*." He says true *rubra* differs from it in its flat radical leaves, strongly tufted growth without runners. Later I sent a large set of *Bromus racemosus* and *commutatus* expressing a belief that they were not specifically distinct. He replied, "I have studied these . . . and also confess that I have

altered my opinion on the value of the two species. I am now inclined to see in them only varieties of one species which should bear the older name, *B. racemosus* L. The intermediates between the two plants are too numerous, the differences too weak, to be equal to those between good species," and he goes on to give a diagnosis of them as varieties. He and his wife had a wide range of tastes and were fond of travel. In February 1910, he went with his wife to Italy because "The winter in our country is tedious, chiefly on account of its long duration. At this moment we have a continuous cover of 30 cm. depth of snow, and the weather is predominantly dim and cloudy. In January we had only six sunny days, in February three till now out of twelve, no wonder that we long for more sunny countries. I am very grateful to you for your kind wishes, for the separate copies, and your portrait." Their visit to Nice was cut short because (Attersee, March 3, 1912), "In my absence thieves broke into my villa, plundering it and causing heavy damages to the furniture. . . . As yet they have been undetected." On the 10th March 1912 he says the damage caused by thieves amounted to 1500 or 1600 crowns. I felt this was a fitting time to show our sympathy, and, therefore, sent out a circular to our members, which resulted in a handsome sum being subscribed. I informed him of this, and asked him which would be most pleasing to him—any special books or plate or a cheque which, perhaps, he might like to use in replacing some of the articles stolen, or in repairing the damage done. Professor Hackel replied, "I enjoy very much the expression of sympathy on the part of the members, which I fully estimate. But I must beg your pardon for not accepting the gift which you propose, because it has been connected with the sad event that troubled me and my wife last winter, and it would become a memento, not only of the amicable minds of the contributors, but also of the adversity we endured, the memory of which we use all efforts to erase from our minds." In case, he says, it is difficult to return it to the subscribers, he would suggest that it might be given to some student with slender means. "Such an appliance of it would give me more satisfaction than any object of art or the like could afford. I beseech you to transmit to the members my best thanks for their amicable design, and to assure them that I shall always put to their disposal my knowledge of grasses." He (31/10/1912) cordially approved of the method we adopted in carrying out his suggestion for disposal of this money. It may be remembered he took a great interest in the Galashiels Aliens. They included two species of *Nassella*, a genus of which no alien species had hitherto been found. "The fact of mountain species of the Andes reappearing as aliens in Scotland is beyond doubt." The Chilian *Stipa* had been found only once by Poeppig.

The correspondence of Hackel teems with interesting details. A few of these have been printed in our Reports, but it may be well to call attention again to some of them.

POA LAXA and STRICTA Syme. He writes (20/10/1896)—"I believe with you that all records of [true] *Poa laxa* and *stricta* Lindeb. in

Scotland are erroneous." *P. laxa* of Lochnagar differs from type *laxa*, and I therefore named it var. *scotica* (*Journ. Linn. Soc.* xxxv., 427). He believed *Poa Chaixii* to be native in Britain.

DEYEUZIA STRIGOSA. Writing from Attersee (1/1/1908), on Caithness specimens, which agreed with Bennett's *strigosa*, he says:— "This specimen approaches really somewhat *C. strigosa*, but does not agree with it in the length of the callus-hairs, which are of the length of the floret in *strigosa*. Also the panicle is much broadened and laxer in *strigosa*. I agree with Almquist (*Neum. Sver. Fl.* 1901), who declares *C. strigosa* to be a hybrid of *C. Epigeios* and *neglecta*. Should it not be possible that it [the plant from Caithness] be a hybrid? It has really some of the characters of *Epigeios*, in the form of the outer glumes, but it is much nearer *C. neglecta* than *C. Epigeios*, while *strigosa* is almost intermediate." Other forms from Loch Watton and Scarmclett he said were [137] typical *neglecta*, [35] *neglecta*, with somewhat longer and more acute glumes. Subsequently (21/12/1902), he referred the Caithness "*strigosa*" certainly to a var. of *neglecta*, which I named var. *scotica*, and more recently raised to a species or sub-species. Hackel, it seems, was doubtful if *C. strigosa* grew in Scotland.

KOELERIA VALLESIACA. (St Polten, 9/10/1907). "Especially interesting is the *Koeleria* from Brent Downs, though the specimen is very scanty. I do not hesitate to recognise that it belongs to *K. vallesiaca* Gaud. (*K. vallesiana* A. & G. Synopsis ii., 354). The swollen base of culms and innovations, consisting of a mass of old sheaths from which the fibres (vascular bundles) wither out, becoming free and reticulated, is very characteristic of *K. vallesiaca*. This species has never been recorded from Great Britain, and it would first be necessary to find out whether the plant has survived in its station from the time of Dillenius to ours. The existence of *K. vallesiaca* in Western England would be very interesting, but not very surprising, that species existing also in Western France, chiefly in the "Landes," and northward up to the Loire river. In the interior of France it is yet more common.

The perennial form of *Poa annua* from Thurso is also interesting, and I hope you will fix your attention in the coming season to similar forms, and if possible gather some of them for me."

FESTUCA DUMETORUM L. (12/8/1910). "In my view this is a sub-species of *F. rubra*."

AGROPYRON ACUTUM DC. (14/12/1907). Hackel says he does not believe the true *Triticum acutum* DC. occurs in Britain. "The plant, of which I have splendid specimens ex loco classico, by Duval Jouve, seems to be a hybrid of *T. junceum* with *T. litorale* Host, a view which Duval Jouve first uttered (*Bull. Soc. Bot. Fr.* 1878). The *T. acutum* of British and North German authors is *T. junceum* x *repens*. Of this I have seen specimens from Arran and "Shore at Hamble, S. Hants." In our *Report* 578, 1897, he thought it might be *T. laxum* Fr. See also *Rep. B.E.C.* 33, 1903. I named this hybrid *Agropyron Hackelii* in *Report* 252, 1906. "*A. pinguis* (1/11/1904), can be distinguished from

this hybrid by the tight spikes, elongated and somewhat mucronate, and by the fertile glumes, etc. It also has an awned form."

GLYCERIA FESTUCIFORMIS. On November 11, 1909, he writes "The *Glyceria festuciformis* from Strangford Lough is a very critical form, by no means identical with the type of our Istrian salt-marshes, but approaching the plant I named (*in lit.*) *Atropis Foucaudii*, which has since been published in Husnot's 'Gramineae.' But it differs from the French plant in its somewhat convolute leaves, smaller and more contracted panicle and fewer spikelets. It seems to be a distinct local form which ought to receive a name as a variety or sub-species. The whole group of *A. distans*, in the wider sense to which also *A. festuciformis* belongs as a sub-species, is so very difficult to bring into a system that it requires the work of a monographer who will have to study it at least for a year or more. We must look to the future for such work. Your No. 2 is the same, but with more open panicle, and somewhat smaller spikelets, making an approach to *A. distans*." On October 10, 1909, he says he is not able to describe the Strangford Lough plant, as he is not at all clear about its difference from the neighbouring forms. It requires more study, not only of that, but of all the kindred forms. It will be observed that he speaks of the Irish plants as belonging to *A. distans*, but a closer examination led me to believe it belonged to *Glyceria maritima*, as a well-marked variety which I named var. *hibernica*. I subsequently found it in great plenty on the Sussex coast, and also in Hampshire. "*Atropis Foucaudii*," he says (30/12/1908), "is in its typical form of southern France well distinguished from *festuciformis*, but all those species (*festuciformis* itself, *convoluta*, *pseudo-distans*), are very critical, and their distinctions from *distans* are often uncertain." [In this letter he gives a diagnosis of the sub-var. *pruinosa* of *Festuca rubra*]. As regards the *festuciformis*, on October 30, 1916, Dr Stapf, writing from Kew, says, "In my opinion there is no *Atropis festuciformis* in the British Isles. Your specimens from South of England [W. Sussex], and the one from Ireland [Strangford]) are *A. maritima* or *Foucaudii*, at any rate they are indistinguishable from an Irish specimen named by Hackel as *Foucaudii*. . . . I would, therefore, suggest to treat them at present (and also the *festuciformis* from Co. Down) as *A. maritima*."

AGROSTIS PUMILA L. (Attersee, 26/11/1908). "You wish to have my opinion of *Agrostis pumila*. This is a matter which vexed me often, and I must confess that I did not come to a satisfactory result about this question. I think that only field-observation and carefully directed cultures can settle it. As *A. pumila* does not grow in my neighbourhood, I am not able to make such investigations, but I should be very happy to hear that you would undertake that work. In herbaria I see *A. pumila* always with ovaries affected by *Tilletia*, but in literature I find some statements pointing out that we have to distinguish between the *pumila* state caused by *Tilletia* and another *pumila* free from it. Boreau declares (*Mém. Soc. Maine et Loire*, 1862), that he observed *A. pumila* L. near Angers without the fungus on the ovaries. A. & G. (*Synopsis* ii,

181), have a variety *humilis* of *A. vulgaris*, of which they say that it is very characteristic and grows in great quantity on the shores of lakes, wet sands, in heaths, etc." Hackel considered the form with the ovaries infested by *Tilletia decipiens* to be very similar to var. *humilis*. He distinguishes, therefore, between *pumila*, the diseased form of *vulgaris*, and var. *humilis* without the fungus. Of *A. alba* he enumerates *A. alba E. pumila* Kunth, a form caused by *Tilletia decipiens*, and of *A. canina* L., he says there is a form with strange-looking spikelets caused by *Tilletia*.

One of the last letters from him I received is dated February 4, 1913. "You will, perhaps, observe that I am not now, as I was in former years, much inclined to distinguish and name "micromorphs." There is no doubt that I could add a dozen or more forms of *Festuca rubra* to those distinguished in my Monograph of Festucas, but I am doubtful about the use of it for science. I am also of opinion that without field observations, the dignity of such inferior forms cannot be rightly evaluated. And so I let them be unnamed. I wish you good health, much pleasure and success in your voyage to the West Indies. I should be happy to accompany you there, but for a severe attack of rheumatism, which I owe no doubt to the eternal moist weather of the last autumn. I hope to expel it by a cure which I shall undergo at Meran. We shall add some weeks' sojourn on the Riviera. I long to see like you the tropical vegetation, and to study its biological conditions. I hope to be able to make a voyage with my wife to Java and Ceylon for that purpose. We intend to sell our villa and to settle in a milder climate, perhaps at Meran, but it will take some time to find a buyer for it, my great herbarium and library being an obstacle for changing domicile so freely as we wish to do. I have already thought of selling them, too. This would put an end to my systematical study of grasses, of which I am already tired, and would lead me wholly to the way of ecological studies and field-observations on botanical voyages. I have seen so little of forms of vegetation other than ours. For my wife also, who suffers sometimes from depressions of mind, it would be a blessing to enjoy a less monotonous life than we have led these last years. But all these are projects which need to be well considered! I shall follow you in my mind to the brilliant vegetation of Jamaica and other British West Indian Islands." Then came the Great War and the cessation of our correspondence. That war and its results practically ruined him, and although he remained at his old home, it was with shattered health and means of the straitest. He was a real student, a lover of nature, and a ready helper to those who stood in need. Some of our poorer members have to thank Eduard Hackel for so generously handing over the testimonial for their use, and the Society has lost one of its most helpful critics and a kindly friend.

HOLFORD, COLONEL SIR GEORGE LINDSAY, K.C.V.O. Born June 2, 1860, the son of Robert Stayner Holford and of Mary Ann, daughter of General James Lindsay of Balcarres, Fife; died at Westonbirt,

Gloucester, September 11, 1926. His father, known as Squire Holford, was M.P. for the Eastern Division of Gloucestershire from 1845 to 1872. His three daughters married the late Earl of Morley, the late Earl Grey, and Mr Robert Henry Benson of Buckhurst, the eminent banker, and a great art collector. The Holford family were established in Cheshire in the seventh century, and it was by marriage to an heiress of the Crewe family that Westonbirt came into the possession of Sir Robert Holford, Master in Chancery. Both his son and grandson held the same office. About the middle of the nineteenth century, another property in the county came into possession of the Squire, inherited from an uncle. He was a great and judicious collector, not only of pictures, but of illuminated MSS. and Shakespearian Folios. He possessed the first edition of Bunyan's "Pilgrim's Progress" of 1678, and a remarkable collection of prints and drawings. The latter was a testimony to his judgment for though they had cost £7000 they realised over £28,000 when sold in 1893. Gloucestershire has at Hynam another house with rare Italian paintings and an arboretum which is about the same date as that at Westonbirt. The owners of the two estates had a wholesome rivalry. Mr Holford determined on rebuilding Westonbirt and entrusted it to the architect, Vulliamy, in 1863, who raised an ornate and stately structure inspired, as was Mentmore, by Wollaton Hall near Nottingham, which was built by John of Padua, but it is by no means a slavish copy. It was set in grounds of great beauty, in the preparation of which a village had to be removed. The Squire filled this magnificent mansion with treasures, rich and rare—splendid pictures which included five Rembrandts, four Van Dycks, including the "Abbé Scaglia," Mabuse's "David of Burgundy," several Sustermans and Rubens. Nine of those were shown at the Flemish and Belgian Art Exhibition this year. Of the pictures Mr R. H. Benson has prepared a delightful and scholarly catalogue. The Holford Hobbema was sold some years ago, as was the Velasquez portrait of the Duke of Olivares, which is said to have fetched £70,000. But it was not only the pictures that make Westonbirt so rich. The great salon was panelled with walnut wood obtained from the estate, and had at its end a Papal Throne of the Medici, magnificent Italian Coffers, Venetian Glass, bronzes, and all the accessories of a palace. The outside was worthy of the mansion for the gardens were large, well laid out in stately style (in this Gilpin had a hand), with artificial water which did not assert its artificiality, with an arboretum replete with treasures and with ranges of houses and gardens showing herbaceous borders of glowing grandeur. But it was not only in Gloucestershire that the Squire had a home. He built Dorchester House in Park Lane with Vulliamy as the architect, and it is in the front rank of the great houses of the Metropolis. Its rare marbles, its magnificent staircase and ballroom, and its contents were in no whit inferior to Westonbirt. It was to these two mansions and a large estate of over 16,000 acres that our member succeeded in 1892. He went to Mr Evans' house at Eton in 1873. In 1880 he joined the first Life Guards from which he retired in 1908 as brevet Lieutenant-Colonel.

During the war he commanded the Reserve Regiment of the First Life Guards. From 1885 he was Equerry to the late Duke of Clarence by whom he was held in the highest esteem, and from 1892 to 1910 was Equerry-in-Waiting to King Edward. On King Edward's death he held the same office to Queen Alexandra, and was appointed Extra Equerry to King George. He was made K.C.V.O. in 1910 and C.B.E. in 1919. He married one of the sweetest of women, Susannah West, daughter of the late Mr Arthur Wilson of Tranby Croft and the widow of Mr J. Graham Menzies. A happier union could not be conceived, and their mutual taste was gardening in its highest stage of development. Nothing but loving care and infinite trouble could have made Silk Wood and the surroundings so supremely lovely. Sir George's own speciality was hybridising Orchids and Clivas. When I was last there, in answer to my question about the Cymbidiums, I was told there were over 10,000 seedlings in pots coming on. The blaze of colour radiated by 800 pots of *Amaryllis* in flower as shown by the rays of the descending sun was a spectacle never to be forgotten. To do all this there was an army of nearly a hundred employees. His hospitality was proverbial, and how many minds will be saddened when they realise that those "colour weekends" are now things of the past, for it was his delight to have appreciative friends round him to share the beauties of vernal and autumnal tints. How he loved his garden is shown by an extract from a letter (October 21, 1923), "The autumnal tints have gone on intensifying ever since you left. Many have gone over, but on the whole I think the last two days have been the climax, and the place is looking lovely. No, we have decided not to eat the Chanterells, which grew mostly under yews. As you say 'the game is not worth the Chanterell'." Sir George was an extremely handsome man, and there is a pastel portrait of him at Westonbirt which nearly does him justice. When relieved from Court duties he devoted himself to his trees, gardens and greenhouses at Westonbirt, and with the assistance of such a head gardener as Chapman and his successor he swept the boards at the Horticultural Society with his Orchids and *Hippeastrums*. Gold medals he had galore, but about three or four years ago Westonbirt was burgled and these were all stolen and melted down. The thieves actually entered Lady Holford's bedroom and walked off with (fortunately a replica) of a famous pearl necklace. But it was not the loss of the medals that worried the owner. His sweet disposition overcame that. He had a joy in the contest for a prize rather than for the prize itself, and I think the disarrangement of his papers in the rogues' search for plunder was almost as great an annoyance. He was a Vice-President of the Horticultural Society and a supporter of many of its ramifications and of horticultural exploration. His own magnificent assortment of *Rhododendrons* at Westonbirt was not to be made by money only. My own acquaintance with him dates from the opening of the Municipal Buildings in Oxford in 1897 by Edward, Prince of Wales, when Captain Holford was Equerry-in-Waiting, and I was holding the office of Sheriff. The Prince and he were two stately figures. The ebullition of youth, of Oxford youth, led to a glorious town and

gown, with many broken crowns, not royal be it said, and darkened eyes and a desperate desire to drag the unwilling Prince in a carriage through the mob. We found the Prince a quieter and less exciting way of reaching Christ Church. Perhaps Captain Holford thought they did the thing better at Cambridge but he did not say so, and on their return to Sandringham doubtless the episode was looked upon with kindly and amused eyes. At that time it seemed an unlikely thing that our orbits would ever cross, but in after days he gave me a kind invitation to Westonbirt and year by year the acquaintance warmed into a real friendship. He joined our Society, and was interested in its work. One may call to mind that in 1925 he allowed a meeting of its members to be held in Dorchester House under the Presidency of the Lord Grey of Falldon. Of course Sir George had met everyone—his princely residence in Park Lane had been occupied by the Shah of Persia (not without detriment to it) and by Whitelaw Reid, the American Ambassador. He was held in the highest respect by Royalty, and was beloved by his servants—to link the two extremes is only the attribute of a noble mind. After the death of his gardener, Chapman, I wrote in sympathy. He replied, "The death of my dear old gardener was indeed a great sorrow both to myself and Lady Holford. He was my life-long friend, and in many ways I find it impossible to replace him." In his young days he was a good walker and much interested in athletics, and for some time he shared the glories and expenses with the Duke of Beaufort of the Badminton Hunt. What a sight was the meet at Silk Wood!—a safe draw. I can see—but not with undimmed vision—the last time when the old Duke in his "Ford" and "Billy" Harford on his sideling steed and all the joyance of horse and dog and hunters and that sweet dewy morning and my host and the Duke and Billy—that hunter who botanised, never to draw Silk Wood again. And Westonbirt and Silk Wood pass into other hands (Sir George had no children). May its possessors preserve its beauties and its treasures for other generations to admire! To Kew, Sir George was a generous contributor. He sent a hundred *Hippeastrums* in 1895, and in 1913 two hundred, and in 1922 six hundred *Orchids*, many being Westonbirt hybrid *Cattleyas* and *Laelias*.

HOYLE, Dr W. E. Born at Manchester, 1856; died at Porthcawl, February 1926. The son of an engineer connected with Armstrong Whitworth, he studied at Owen's College, and in 1874 gained an exhibition to Exeter College, Oxford. He afterwards became Junior Student at Christ Church taking a first-class in Natural Science. He took his D.Sc., and studying at St Bartholemew's his M.R.C.S. in Medicine. He was demonstrator of Anatomy at Owen's College when he was appointed to the Editorial Staff of the Challenger Expedition, working chiefly on the Cephalopods on which he wrote several memoirs. In 1909 he was appointed the first Director of the then embryonic National Museum of Wales, of which he became a most competent and energetic head. Great as its success has been no one will deny that in a great measure it has been due to his foresight and ability.

PHILLIPS, REGINALD W., D.Sc. Born at Talgarth, Brecon, 1854; died at Leominster, December 2, 1926. He was educated at the Normal College, Bangor, and St John's College, Cambridge. He was appointed Professor of Botany at University College, Bangor, in 1894. He was a distinguished student of the Algae, on which he wrote many papers.

RUSSELL, HAROLD JOHN HASTINGS. Born 1868; died 1926. The son of Lord Arthur Russell and Laura, daughter of the Viscount de Peyronnet, he was educated at Balliol College. He married Lady Victoria Alberta Leveson Gower, daughter of the second Earl Granville. He was called to the Bar, Inner Temple, in 1894, and appointed Recorder of Bedford in 1912. He became a Fellow of the Linnean Society, and wrote a work on *The Flea* in 1913, and a book "Chalkstream and Moorland" in 1911. Although not a collecting botanist he was a keen lover of nature, and was a constant and careful reader of our *Reports*. He possessed a delightful sense of humour and had a facile pen. He rendered great service in the preliminary work of mapping out desirable Natural History areas for preservation, and was a valued member of that Society. His kindly position and cheery presence will be sadly missed by a large circle of friends.

TURNER, CHARLES. Born 1864; died at Wilmslow, Chester, 1926. He was the Principal of the Manchester School of Pharmacy and was a vice-president of the Manchester Microscopical Society from 1899-1914. He was a keen student of the Fresh Water Algae and Desmids. See *Pharm. Journ.*, September, 18, 1926.

## NEW COUNTY AND OTHER RECORDS.

ABBREVIATIONS.—*Rep. B.E.C.* = *Report of the Botanical Society and Exchange Club*; *Trans. Bot. Soc. Edin.* = *Transactions of the Botanical Society of Edinburgh*; *Wats. B.E.C.* = *Report of the Watson Botanical Exchange Club*; *Devon. Tr.* = *Transactions of Devonshire Association of Science, &c.*; *Journ. Bot.* = *Journal of Botany*; *Nat.* = *Naturalist*; *N.W. Nat.* = *North Western Naturalist*, ed., A. A. Dallman; *W.F. Mag.* = *Wild Flower Magazine*, ed., Mrs Dent; *Fern Gaz.* = *British Fern Gazette*, ed., F. W. Stansfeld; *Rep. Marl.* = *Report of the Marlborough College Natural History Society*; *R.I.C.* = *Journal of the Royal Institute of Cornwall*; † = *Adventive*; \* = *New County Record* (in the case of adventive plants this is only rarely added); ! placed after a plant signifies that the compiler has seen a specimen; ! placed after a locality that the compiler has seen it there; × placed between two scientific names or before a binomial means that the plant is a hybrid; 52, &c., numbers following a county, refer to the Watsonian vice-county in *Topographical Botany*; [ ] enclosing a record mean that confirmatory evidence is needed.

We are under great indebtedness to Dr A. Thellung for his most kindly help in determining so many of the adventive species, and we have also to thank the Director of the Royal Botanic Gardens, Kew, Mr J. Fraser, Mr W. O. Howarth, Prof. C. H. Ostenfeld, Dr Ronniger, Dr J. Murr, Dr E. Almquist, M. Jaquet, Mr A. Bennett, Dr Drabble, Mrs Gregory, Mr C. E. Britton, Dr Dahlstedt, M. Paul de Riencourt, Mr C. E. Salmon, Mr W. H. Pearsall, Rev. J. Roffey, Mr D. Lumb, Mr C. V. Marquand, Rev. H. J. Riddelsdell, and others who have rendered critical assistance.

7. *THALICTRUM ALPINUM* L. At 2786 feet on Cul Mhor, W. Sutherland, MILLER.

\*9. *ANEMONE NEMOROSA* L. Noirmont, Jersey, ARSENE.

†11. *A. APENNINA* L. Fairy Hill Woods, Glamorgan, WEBB.

†13. *A. FULGENS* J. Gay. Grassy slope of old quarry, Tenby, Pembroke, DRUCE.

16. *ADONIS ANNUA* L. In great abundance in a cornfield in 1925 at Aston Tirrold, Berks, where large bunches were gathered by children to decorate the village war memorial. In 1926, under another crop, hardly a plant appeared, DRUCE.

22. *RANUNCULUS BULBOSUS* L. With sulphur-yellow petals, Great Salkeld, Cumberland, BRITTON.

24. *R. FLAMMULA* L. Plants intermediate between var. *latifolius* Wallr. and var. *alismsifolius* Glaab. Layter's Green, Bucks, DYMES. Var. *PETIOLARIS* Marshall. (*scotica*). Mellon Charles, W. Ross, DRUCE.

25. *R. REPTANS* L. Barron Wood, near Armathwaite, on rocks in the river Eden, BRITTEN.

30. *R. SCELEBRATUS* L., forma *SUBINDIVISA*. With entire leaf-lobes, near Lewes, Sussex, DRUCE.

33. *R. OPHIOGLOSSIFOLIUS* Vill. Discovered in a locality in White's Bristol area, West Gloucestershire, N. SANDWICH.

38. *R. TRICHOPHYLLUS* Chaix, var. *GODRONII* (Gren.). Westbury, W. Gloster, WHITE; Plumpstead, Kent; Barningham, W. Suffolk; Batterley, Durham, FOX; Totternhoe, Beds, SAUNDERS; Loch Winlass, Caithness, DRUCE. Var. *RADIANS* (Revel). Alum Bay, Isle of Wight, DRUCE.

39. *R. DROUETH* F. Schultz. Reay, Caithness, DRUCE.

40. *R. HETEROPHYLLUS* Weber. Brockenhurst, S. Hants, GROVES; Sheepy, Leicester, PAINTER, as *Petiveri*. Var. *SUBMERSUS* Bab. Ferryhill, Durham, FOX.

41. *R. PELTATUS* Schrank. Kenfig, Glamorgan, DRUCE.

41. *R. PSEUDO-FLUITANS* B. & F. Alton, N. Hants, VAUGHAN; Fishbourne, W. Sussex, BURDON; Little Lodge, Essex, FOX.

42. *R. BAUDOTII* Godr. Grangetown, Cardiff, WADE.

43. *R. TRIPARTITUS* DC. Dosmery Pool, St Neot, Cornwall, FOX.

47. *R. FICARIA* L., forma *LUXURIANS* Moss. Dr Winkler of Breslau, who is making a critical study of this species, thinks the characters of this forma are due to its place of growth. He has the forma growing in the Botanical Gardens at Breslau not among grass but as single individuals in humic soil. The characters are shown when the rhizomes are placed somewhat deeper in the ground. The Breslau plants show abnormal leaves of the same shape as those of the plant he has from La Haule, Jersey.

48. *CALTHA PALUSTRIS* L. A late-flowering form with small sepals, near Holmsley, New Forest, S. Hants, September 17, 1926, DRUCE.

49. *C. RADICANS* Forst. By the Feugh, Kincardine, July 1926, DRUCE.

†68. *ACONITUM ANGLICUM* Stapf. Abundant and luxuriant by the Blyth river, Northumberland, Mrs BURDON & FOGGITT.

†74. *EPIMEDIUM ALPINUM* L. Near Aberfeldy, Perth, Lady DAVY & FOGGITT.

77. *CASTALIA ALBA* Wood. In a small lake near Flowerdale, W. Ross, DRUCE. Var. *occidentalis* (Ost.). Loch Kinord, S. Aberdeen, with *Nymphæa pumila*; Achilty, Strathpeffer, W. Ross, DRUCE; near the Kyle of Tongue, W. Sutherland, 1885, FOX.

80. *PAPAVER RHOEAS* L., \*var. *chelidonioides* O.K. Beaconsfield, Bucks, Mts WEDGWOOD. Var. *hoffmannianum* O.K. Hassocks, E. Sussex, DRUCE.

82. *P. LECOQII* Lam. Between Tetbury and Malmesbury, Wilts; Charlton Kings, Gloster, MURRAY.

88. *MECONOPSIS CAMBRICA* Vig. In some quantity by the river near Clatterin' Brig, Kincardine, DRUCE; Galashiels, Selkirk, Miss HAYWARD & DRUCE; Highcup Nick, Westmorland, FOGGITT.

89. *GLAUCIUM GLAUCIUM* (L.). Hythe Quay, Colchester, BROWN.

†91. *ROEMERIA HYBRIDA* DC. At Splott, Cardiff, Glamorgan, from July to October 4, when we saw it in flower, Miss VACHELL, WADE, SMITH & DRUCE; Royston, Herts, with other aliens, BUTCHER.

102. *CAPNOIDES CLAVICULATA* (L.) Dr. Steep, S. Hants, B. J. BROOKE.

125. *RADICULA AMPHIBIA* Dr. Coup near Condorrat, Lanark, GRIERSON; Old Hartlepool, Durham, FOX.

133. *ARABIS HIRSUTA* Scop. In quantity on black fen peat on a drove from Great Shell Farm, Prickwillow, to Burnt Fen, Cambs, June 20, 1914. With it was *Anthriscus vulgaris* and, in the dykes alongside, *Hydrocharis Morsus-ranae* (flowering). See *Rep. B.E.C.* 1925, p. 1032, l. 9, LITTLE.

†137. *A. MURALIS* Bert. Slinfold, Sussex, B. REYNOLDS.

143. *CARDAMINE AMARA* L. A small-flowered form, St Clement's, Lincoln, MASON.

†151. *ALYSSUM STRIGOSUM* Sol. (*A. MONTANUM* M. Bieb.). Burton-on-Trent, Staffs, DRUCE.

161. *DRABA INCANA* L. Very dwarf specimens on the sea sand at Mellon Charles, W. Ross, DRUCE.

162. *D. MURALIS* L. Sleightholme Valley, N. Yorks, FOGGITT.

163. *EROPHILA VERNA* Meyer. Rare or overlooked, Gairloch, W. Ross, DRUCE.

167. *COCHLEARIA OFFICINALIS* L. Gairloch, W. ROSS, DRUCE.
170. *C. GROENLANDICA* L., or what passes for it. Poolewe, W. ROSS, DRUCE.
- †177. *WILCKIA MARITIMA* Scop. Railway side, Bradford, Yorks, REYNOLDS; Dundee, R. & M. CORSTORPINE.
- †184. *SISYMBRIUM ALTISSIMUM* L. Gainsborough, N. Lincs, WILLOUGHBY SMITH; abundant, Burton-on-Trent, Staffs, DRUCE & CURTIS; Burnham, Somerset, MILLER.
- †185. *S. ORIENTALE* L. Burton-on-Trent, Staffs, DRUCE & CURTIS.
- †187. *S. LOESELII* L. Port Meadow, Oxon, GAMBIER PARRY; Burton-on-Trent, Staffs, DRUCE & CURTIS.
192. *S. THALIANUM* Gay. Gairloch, W. ROSS, DRUCE.
197. *ERYSIMUM CHEIRANTHOIDES* L. Ro Wen, Carnarvon; abundant in a cornfield near Eglwysbach, Denbigh, WILSON.
- †200. *CONRINGIA ORIENTALIS* Dum. Burnham, Somerset, MILLER.
- †201. *CAMELINA SATIVA* Cr. Burnham, Somerset, MILLER.
- †214. *BRASSICA JUNCEA* Coss. Bitterne, S. Hants; Burton-on-Trent, Staffs, DRUCE.
- †217. *B. ALBA* Boiss. Burnham, Somerset, MILLER.
- †224. *B. INCANA* (L.) Doell. Bowling, Dumbarton, GRIERSON; Burton-on-Trent, Staffs, DRUCE.
- †228. *ERUCA ERUCA* (L.) Dr. Dundee, Forfar, R. & M. CORSTORPINE.
- (Dr E. Almquist has kindly determined the following Bursas.)
232. *BURSA ABSCISSA* (E. At.). Durham; Strachan, Kincardine, DRUCE.
232. *B. ANGLICA* (E. At.). Coverack, Cornwall; Putney, Surrey, FOX; Barry, Glamorgan; Newtimber, Sussex, DRUCE.
232. *B. BATAVORUM* (E. At.). Colchester, BROWN; Great Bardfield, Clacton, Essex, 1916, FOX; Newtimber, E. Sussex; Dundee, DRUCE.
232. *B. BREMENSIS* (E. At.). Reading, Berks; Byfleet, Surrey; Blackwater, N. Hants, DRUCE.
232. *B. BRITTONII* (E. Ait.). Brimpton, Berks; Marston, Oxon; Sandhurst, Berks; Blackwater, N. Hants, DRUCE.

232. *B. CONCAVA* (E. At.). Myton, Warwick, BROMWICH; S. Zeal, Devon, FOX; Port Meadow, Oxon; Burton-on-Trent, Staffs, DRUCE.

232. *B. DRUCEANA* (E. At.). Putney, Surrey, FOX.

232. *B. GALLICA* (E. At.). Coverack, Cornwall, FOX; Goring, Oxon; Stafford; Arundel, W. Sussex, DRUCE.

232. *B. GERMANICA* (E. At.). Clacton, N. Essex; Sandhurst, Berks; Burton-on-Trent, Staffs; Durham, DRUCE.

232. *B. ORIGO* (E. At.). Marcham, Berks, DRUCE.

232. *B. PATAGONICA* (E. At.). Alridge Station, Staffs; Galashiels, Selkirk; Flowerdale, W. Ross, DRUCE.

232. *B. SINUOSA* (E. At.). Putney, Surrey, FOX; Sands, W. Ross; Fochabers, Elgin, DRUCE.

232. *B. TREVIVORUM* (E. At.). Usk, Monmouth, 1890, AUGUSTIN LEY (named by Mott CUNEATA), Wimbledon, Surrey, FOX; Durham; Henley [DD72], Oxon; Gloucester; Perth; Arbroath, Forfar; Strachan, Kincardine; Leith, Midlothian, DRUCE.

232. *B. TURONIENSIS* (E. At.). Sandhurst, Abingdon, Berks; Blackwater, N. Hants; Henley, Oxon; Byfleet, Surrey; Brentford, Middlesex; Burton-on-Trent, Tamworth Paper Mill, Staffs; Ripon, Yorks; Stirling; Loch Maree, Ullapool, Flowerdale, W. Ross; Falloden, Northumberland, DRUCE.

†240. *LEPIDIUM RUDERALE* L. Field, Penmaenmawr, Carnarvon, WILSON.

†247. *L. DENSIFLORUM* Schrad. Derby, Miss COBBE; Godmanchester, Hunts, DRUCE; Grimoldby, Lincs, GOULDING; Burnage, Lancs, BRITTEN; Burton-on-Trent, Staffs, DRUCE & CURTIS; Beaconsfield, Bucks, Mrs WEDGWOOD; Burnham, Somerset, MILLER.

†247. *L. VIRGINICUM* L. Burnham, Somerset, MILLER.

\*252. *IBERIS AMARA* L. Ancaster quarries, Lincoln, Miss G. BACON.

254. *TEESDALEA NUDICAULIS* Br. Shingle of the Feugh, Kincardine, DRUCE.

†258. *VOGELIA PANICULATA* Desv. Burnham, Somerset, MILLER; Campbeltown, Argyll, Miss BROWN.

†263. *BUNIAS ORIENTALIS* L. Lambridge, Oxon, DRUCE; Broxbourne, Herts, Miss TROWER; Moulsoford, Berks, Miss NIELD.

†273. *ERUCARIA MYAGROIDES* Hal. Giffnock, Renfrew, GRIEBSON.

+276. *RAPHANUS LANDRA* Moretti. Avonmouth, W. Gloster, C. & N. SANDWITH.

+280. *GYNANDROPSIS PENTAPHYLLA* DC. Dagenham, S. Essex, R. MELVILLE.

288. *HELIANTHEMUM HELIANTHEMUM* (L.). Strachan, Kincardine, DRUCE.

(Mrs Gregory, with her usual kindness, has reported on the following Violets.)

292. *VIOLA MONTANA* L. Near Woodhall Spa, Lincoln, Miss STEWART.

296. *V. CANINA* × *RIVINIANA*. Newport, Monmouth, DRUCE.

297. *V. LACTEA* Sm. Keys' Corner, Chatteris, Cambs, FRYER.

298. *V. ODORATA* L. A curious form with small, irregularly shaped flowers, the petals being narrower and wavy, and of a dingy white, occurred at Stansteadbury, Miss TROWER. Var. *SUBCARNEA* (Jord.) Parl. Pool Bottom, Oxon, DRUCE; Wyke-Benthall, Salop, Mrs W. R. ALLEN. Var. *DUMETORUM* Jord. Mouth of Avon, Ayrshire, GRIEYSON. Var. *IMMACULATA* Greg. Fairwater, Glamorgan, in plenty, Mrs O'CALLAGHAN & Miss VACHELL.

299. *V. HIRTA* L., var. *HIRSUTA* Lange. Besilsleigh, Berks, DRUCE. Forma *RUDICAULIS*, all parts shaggy except peduncles, Druridge Bay, Northumberland, FOX. Var. *FOUDRASII* (Jord.). Pool Bottom, Oxon, DRUCE; Aldbourne, Wilts, Miss TODD. Var. *INCONCINNA* J. Briquet. Headley Lane, Aldbourne, Wilts, Miss TODD; Surrey, FOX. Var. *PINETORUM* Wiesb. Carham, Northumberland, FOX. Var. *PROPERA* (Jord.). Pool Bottom, Oxon, the flowers of a lovely purplish colour, DRUCE. Var. *OENOCROA* Gill. Aldbourne, Wilts, Miss TODD. × *ODORATA*. Shincliffe, Durham, 1842, ANDREWS in *Hb. Druce*; Aldbourne, Wilts, Miss TODD.

(Dr Drabble has kindly determined the following Pansies.)

304. *VIOLA ANGLICA* Drabble. St Margaret's Bay, Kent, DRUCE. *f*

304. *V. AGRESTIS* (Jord.). Perranarworthal, Cornwall, F. H. DAVY; Kingston Vale, Surrey, FOX; Alresford, N. Hants, DRUCE.

304. *V. ARVATICA* Jord. St Minever, Cornwall, FOX; Goadly Marwood, Leics, HORWOOD.

304. *V. CONTEMPTA* Jord. Wallingford, Berks, DRUCE; Stone, Kent, }  
MARRIOTT.

304. *V. MONTICOLA* Jord. Saintfield, Co. Down, 1910, C. H. WADDELL as *lepidula*.

304. *V. RURALIS* Jord. Wallingford, Berks, DRUCE.
304. *V. SEGETALIS* Jord. Osney, Oxon; Dumfries, FOX.
304. *V. DESEGLISEI* Jord. Hanslope, Bucks; Burton-on-Trent, Staffs; Barry, Forfar, DRUCE.
304. *V. VARIATA* Jord. Big Sand, W. Ross; Norwick, Unst, Zetland, DRUCE, as *Lloydii*; Sedbergh, Yorks, TRAPNELL.
304. *V. LEPIDA* Jord. Bawtry, Yorks, WEBSTER; Feugh, Kincardine, DRUCE.
304. *V. LEJEUNEI* Jord. Greenford Green, Middlesex, 1908, LOYDELL; Hanslope, Bucks, DRUCE.
304. *V. LLOYDII* Jord. Lough Gilly, Armagh; Hanslope, Bucks; Galashiels, Selkirk, DRUCE; Oldworth Mill, Cheshire, WOLLEY-DOD, as *carpatica*; Llangammarch, Brecon, as *saxatilis*; Brilley, Hereford, A. LEY; Finchingfield, N. Essex, VAUGHAN.
316. *POLYGALA DUBIA* Belyneck. Wareham, Dorset, Miss TODD; near Feugh, Kincardine, DRUCE.
318. *DIANTHUS DELTOIDES* L. Yetholm, Roxburgh, Miss HAYWARD.
- †331. *SAPONARIA VACCARIA* L. Burnham, Somerset, MILLER.
- †332. *S. OFFICINALIS* L., flore pleno. Bramdean, Hants, STEPHENS, ex WEBSTER.
- †339. *SILENE CONOIDEA* L. Bristol, W. Gloster, C. & N. SANDWICH.
343. *S. ANGLICA* L. With pink petals near to *gallica*, Corfe, Dorset, Miss TODD.
359. *LYCHNIS ALBA* × *DIOICA*. Sedbergh, Yorks; Mathry, Pembroke, TRAPNELL.
- †367. *CERASTIUM TOMENTOSUM* L. Maritime shingle, Snettisham, Norfolk, J. GILMOUR.
- \*373. *C. SEMIDECANDRUM* L. Big Sand, W. Ross, DRUCE.
374. *C. TETRANDRUM* Curt. Sandhills, Little Sands, W. Ross, DRUCE.
377. *STELLARIA AQUATICA* Scop. Coxwold, N. Yorks, FOGGITT.
378. *S. NEMORUM* L. Hackfall, W. Yorks, FOGGITT.

391. *ARENARIA SERPYLLIFOLIA* L., var. *MACROCARPA*. Helston, Cornwall, Major ORME.
- \*392. *A. LEPTOCLADOS* Guss. Melmerby, Cumberland, MASON.
394. *A. TENUIFOLIA* L. Broughton, Hants, Miss H. M. SALMON.
398. *A. SEDOIDES* Dr. Near summit of Cul Mhor, W. Sutherland, MILLER.
399. *SAGINA NODOSA* Fenzl. Big Sand, W. Ross, also as the var. *MONILIFERA*, DRUCE.
401. *S. SUBULATA* Presl. Sea cliff, New Gate, Pembroke, TRAPNELL.
405. *S. CILIATA* Fr. Wivenhoe, N. Essex [2318], BROWN, teste THELLUNG. Var. *FILICAULIS* (Jord.). Beaconsfield, Bucks, Mrs WEDGWOOD.
406. *S. APETALA* Ard. Exeter, Fox. Var. *BARBATA*. Berry Head, Devon, DRUCE.
408. *S. PROCUMBENS* L., var. *DAVIESII* Dr. Danby Beacon, Yorks, B. REYNOLDS.
412. *SPERGULARIA MEDIA* Presl, var. *APTERA* (Marshall). Gairloch, W. Ross, 1926, DRUCE.
418. *CLAYTONIA SIBIRICA* L. Damp hedge-bank, far removed from habitations, Letterkenny, Donegal, F. R. BROWNING.
419. *C. PERFOLIATA* DONN. Boar's Hill, Berks, 1926, Miss OWEN.
- \*424. *ELATINE HEXANDRA* DC. In a lake, West Denbigh, DALLMAN & WILSON in *N.W. Nat.* 215, 1926; in great plenty and in beautiful condition in Llyn Mynydd-y-Geer, Glamorgan. Shown me in October by Miss Vachell. It was previously discovered there by R. L. Smith and A. E. Wade.
435. *HYPERICUM QUADRANGULUM* L. Kingston, Cambridge, A. H. EVANS.
- †447. *LAVATERA THURINGIACA* L. Thompson, W. Norfolk, C. & N. SANDWICH.
- †452. *MALVA NICAENSIS* All. Fowey, Cornwall, TRESIDDER; Cardiff, Glamorgan, DRUCE.
- †476. *GERANIUM NODOSUM* L. Roadside near Kilburn, N. Yorks, FOGGITT.

488. *G. PURPUREUM* Vill. Erwood, Brecon, Mrs WEDGWOOD.
- †506. *OXALIS STRICTA* L. Henfield, Sussex, 1925, Miss COTTES.
- †511. *IMPATIENS BIFLORA* Walt. Tributary of the Colne, between Aldenham and Pricket Wood, Herts, E. C. CRUTWELL.
- †513. *I. GLANDULIFERA* Royle. Tamebridge, Stafford, abundant, CURTIS & DRUCE; banks of Cod Beck, Thirsk, N. Yorks, FOGGITT & DRUCE.
- †514. *CITRUS AURANTIUM* L. Seedlings, 6 inches high, flowering on Brackenridge Coup, Lanark, GRIERSON.
517. *EVONYMUS EUROPAEUS* L., var. *LEUCOCARPUS* DC. Near Downs School, Colwall, Hereford, F. M. DAY.
- †518. *RHAMNUS FRANGULA* L. Mouth of Avon, Lanark, GRIERSON.
- †521. *VITIS VINIFERA* L. Seedlings, 6 inches high, Kilsyth, Stirlingshire, GRIERSON.
- †522. *V. THUNBERGII* (S. & Z.) Dr. (*Ampelopsis Veitchii*). Barry, Glamorgan, DRUCE, SMITH & WADE.
- †525. *ACEE PLATANOIDES* L. Near Boxhill, Surrey, DRUCE.
533. *GENISTA ANGLICA* L., inermis. The young plant was spineless but later on it developed spines. Cheviots near Wooler, Miss WOODHAM.
538. *ULEX GALLII* Planch. Ascends to 1930 feet on Tal-y-Fan, Carnarvon, WILSON.
- \*†562. *MEDICAGO FALCATA* L. Stokes Bay, S. Hants, C. W. GIBSON; Burton-on-Trent, Staffs, DRUCE & CURTIS.
- †564. *M. VARIA* Martyn, var. *LILACEA* Hy. Silloth, Cumberland, BRITTEN.
- †572. *M. TRUNCATULA* Gaertn. Pevensey, E. Sussex, Miss VACHELL.
- †574. *M. TUBERCULATA* Willd. Cardiff Dock, Glamorgan, MELVILLE.
- †579. *M. HISPIDA* Gaertn., var. *CONFINIS* Burn. Hythe Quay, Colchester [1789, 1790], BROWN.
- †583. *M. ECHINUS* DC. Garden ground, Putney, Surrey, Fox.
- \*†596. *MELILOTUS ARVENSIS* Wallr. Burton-on-Trent, Staffs, DRUCE.
598. *TRIFOLIUM MEDIUM* L. Enderby, Leicester, BEMROSE.

- +605. *T. LAPPACEUM* L. Fulford, Yorks, BRITTEN.
- +607. *T. PURPUREUM* Lois. Bristol, W. Gloster, C. & N. SANDWICH.
- +616. *T. ECHINATUM* M.B. (*supinum* Savi). Bristol, W. Gloster, C. & N. SANDWICH.
- +622. *T. RESUPINATUM* L. Gas works, Hitchin, Herts, M. BROWN, ex LITTLE.
- +627. *T. HYBRIDUM* L. Aultbea, W. Ross, DRUCE. Var. *PHYLLANTHUM*. Hinton Amiral, S. Hants, DRUCE.
632. *T. GLOMERATUM* L. Budleigh Salterton, Devon, Major ORME.
- +644. *LOTUS TETRAGONLOBUS* L. Burton-on-Trent, Staffs, F. W. ANDREWS in *N.W. Nat.* 214, 1926.
- +645 (2). *L. SILIQUOSUS* L. Sheppey, E. Kent, A. E. DAVIES; West Mersea, N. Essex, J. P. BROWN.
648. *L. TENUFOLIUS* (L.) = *L. TENUIS* Kit., var. *LONGICAULIS* Martt.-Don.). Hythe, Colchester, 1924, DRUCE, teste P. de RIENCOURT.
- +649. *DORYCNIUM HERBACEUM* Vill. Sheppey, E. Kent, A. E. DAVIES, }  
ex St J. MARRIOTT.
- +652. *COLUTEA ARBORESCENS* L. Tilbury, Essex, MELVILLE.
- +657. *ASTRAGALUS BOETICUS* L. Par, Cornwall, MEDLIN.
- +667. *CORONILLA SCORPIOIDES* Koch. Par, Cornwall, MEDLIN; Burton-on-Trent, Staffs, DRUCE.
- +678. *VICIA TENUIFOLIA* Roth. Seer Green, Bucks, W. N. JONES.
680. *V. OROBUS* DC. Unthank, E. Cumberland, FOGGITT.
- +680 (2). *V. BENGHALENSIS* L. Stansteadbury, Herts, Miss TROWER.
- +681. *V. VILLOSA* Roth. Leicester, BEMROSE; Robroyston, Lanark, GRIERSON.
- +690. *V. NARBONENSIS* L. Henfield, Sussex, Miss COTTES.
691. *V. LUTEA* L. †Burton-on-Trent, Staffs, CURTIS; Henfield, Sussex, Miss COTTES; Littlehampton Golf Course, Sussex, REYNOLDS.
- +697. *V. SATIVA*, L., var. *NEMORALIS* Pers. Reading, Berks, DRUCE; Coniston, Grassington, Yorks, PICKARD. Var. *OBOVATA* Gaud. Swanage, Dorset, Miss TODD; Mellon Charles, W. Ross, 1926, DRUCE.

698. *V. ANGUSTIFOLIA* (L.), var. *ACUTA* Pers. Henley-on-Thames, Oxon, DRUCE. Var. *CORDATA* (Wulf.). Clacton, Essex, FOX. Var. *ROSEIFLORA* R. & F. Fl. Fr. v., 213. Jacobstow, near Okehampton, Devon, MASON.

706. *V. GRACILIS* Lois. \*Tredudwell, Cornwall (Mrs Pennycoste's locality), RILSTONE; Langton Matravers, Dorset, Miss TODD; near Swyre, Dorset, A. W. GRAVESON; Comberton, Cambs, BUTCHER & FOGGITT.

†711. *LATHYRUS TUBEROSUS* L. \*Shobnall Brewery Siding, Burton-on-Trent, Staffs, DRUCE & CURTIS; \*Stokes Bay, Hants, C. W. GIBSON; \*ditch round Martello Tower, Folkestone, E. Kent, Dr EAGLES.

†718. *L. HIRSUTUS* L. Stokes Bay, Hants, C. W. GIBSON.

†723. *L. CLYMENUM* L. Glasgow, Lanark, GRIERSON.

725. *L. NISSOLIA* L. Langton Matravers, Dorset, Mrs DICKENSON.

726. *L. APHACA* L. Broughton, Hants, Miss H. M. SALMON.

\*777. *RUBUS VILICAULIS* W. & N. Gairloch, W. Ross, DRUCE.

\*778. *R. SELMERI* Lindeb. Selkirk, DRUCE.

\*817. *R. FURVICOLOR* Focke. Fochabers, Elgin, DRUCE.

\*834. *R. MELANODERMIS* Focke. Looe, Cornwall, RIDDELSDELL in *R.I.C.* 102, 1926.

\*847. *R. LINTONI* Focke. West Looe Valley, Cornwall, RIDDELSDELL in *R.I.C.* 102, 1926.

\*857. *R. COGNATUS* N. E. Br. Strachan, Kincardine, DRUCE. New to Scotland.

\*857. *R. KOEHLERI* W. & N. Strachan, Kincardine, DRUCE.

†896. *POTENTILLA INTERMEDIA* L. Dried bed of duck pond, Berechurch Park, N. Essex, BROWN.

899. *P. CRANTZII* Beck. Maize Beck, Westmorland, FOGGITT.

(The *Alchemillas* have been determined by M. Jaquet.)

909. *ALCHEMILLA ALPESTRIS* Sch. Strachan, Kincardine; Kirbister, Orkney; Loch Maree, W. Ross; Dunning, Perth; Patterdale, Westmorland; Hopetoun, Linlithgow; Selkirk; Blairgowrie, E. Perth, DRUCE.

909. *A. PRATENSIS* Sch. Strachan, Kincardine; Tring, Bucks & Herts; Fochabers, Elgin; Lawers, M. Perth; Albrighton, Shropshire;

Huntly, Alford and Corgarff, N. Aberdeen; Basildon, Yorks; High Force, Durham; Dollar Law, Peebles; Selkirk; Bridge of Dun, Forfar; Ballater, S. Aberdeen; Arisaig, Westernness; Accrington, Lancashire; Falldon, Northumberland; Dunning, Perth; Braemore, W. Ross, DRUCE; Athelstanes Wood, Hereford, LEY.

909. *A. ACUTIDENS* Buser. Balmuto, Fife, August 1870, Col. F. STRATTON, as *vulgaris*. Probably the earliest British example.

\*909. *A. TENUIS* Buser. Box Wood, Herts, LITTLE, as *vulgaris*.

909. *A. MINOR* Huds. Finchingfield, N. Essex, VAUGHAN; Stanner Rocks, Radnor; Tingwall, Wadbister, Zetland; Matlock, Derby; Beechwood, Herts, DRUCE.

\*909. *A. SUBCRENATA* Buser. Near Tintern, W. Gloster, DRUCE.

911. *A. ALPINA* L. Our British plant is the restricted *A. GLOMERATA* Tausch.

923. *ROSA ARVENSIS* × *SYSTYLA*. Bigbury, S. Devon, MARSHALL.

925. *R. STYLOSA* Desv., var. *SYSTYLA* Bast. Exeter, DRUCE; Monacum, Cornwall, FOX. Var. *ELLIPTICIFOLIA* Rouy. Odiham, N. Hants, Miss C. E. PALMER. \*Var. *VIRGINEA* Rouy. Chatteris, Hunts; Beaconsfield, Bucks, DRUCE.

926. *R. CANINA* L., var. *SENTICOSA* W.-D. Near Whitby, N.E. Yorks, SNOWDEN, ex REYNOLDS. Var. *SYLVULARUM*, f. *PARISIENSIS*. Purley, Surrey, 1887, E. DE CRESPIGNY, as *dumalis*, var. *insignis* (Déség. & Rip.); Blairadam, &c., Fife, with many other vars., MATTHEWS in *Trans. Bot. Soc. Edin.* 222, 1926.

926. [*R. SENTICOSA* W.-D.], f. *MUCRONULATA* W.-D. Fulmer, Berks, DRUCE. Var. *CURTICOLA* Rouy. Whittlebury, Northants, DRUCE.

932. *R. DUMETORUM* Thuill., var. *HEMITRICHA* (Rip.). Great Crosthwaite, Cumberland, 1882, BAILEY, as *frondosa*. f. *URBICA* towards *SEMIGLABRA*. Hertford, 1846, ANSELL. f. *SEMIGLABRA*. Coverack, Cornwall, FOX. Var. *CALOPHYLLA* Rouy. Newton, Hereford, LEY, as *frondosa*. Var. *mercica* W.-D. Darley Dale, Derby, BAILEY, as *caesia* Sm.

933. *R. DESEGLISEI* Bor., var. *INCERTA*. Wensleydale, York, 1887, COTTON, as *frondosa*.

934. *R. GLAUCA* Vill., var. *REUTERI* Godet. Near Dovedale, a beautiful form, perhaps deserving a name, DRUCE; Oyce of Firth, Orkney, 1880, SYME; Hognaston, Derby, W. R. LINTON; Burntisland, &c., Fife, MATTHEWS, l.c. Var. *SUBCANINA* (Christ). St Andrews, Fife, MATTHEWS, l.c. Var. *STEPHANOCARPA* R. Kell. St Andrews, Fife, DRUCE; Killin,

Perth, E. F. LINTON, as *marginata*; Solihull, Warwick, BAGNALL, as *marginata*.

935. *R. CORIIFOLIA* Fr., var. *SUBCORIIFOLIA*. See *Rep. B.E.C.* 1890. Jamestown, E. ROSS, BAILEY; Crook of Devon, Fife, MATTHEWS, *l.c.* Var. *FRUTETORUM*. Braemar, S. Aberdeen [2938], E. S. MARSHALL; Milnathort, Fife, MATTHEWS, *l.c.* Var. *SUBCOLLINA* (Christ). Bradley, Derby, 1888, W. R. LINTON; Milnathort, Fife, MATTHEWS, *l.c.*

937. *R. EGLANTERIA* L., var. *APRICORUM*. Newburgh, and var. *ECHINOCARPA*. Inverkeithing, Fife, MATTHEWS, *l.c.* × *SPINOSISSIMA*. Hedge near Selkirk, shown me by Miss HAYWARD, DRUCE.

940. *R. TOMENTELLA* Lam. Christ's Hospital, Sussex, REYNOLD. Var. *ROTHSCHILDII* (Dr.). Malden, Surrey [102], BRITTON.

941. *R. TOMENTOSA* Sm., var. *PSEUDO-CUSPIDATA* (Crép.). Strachan, Kincardine, 1926, DRUCE; Burntisland, Fife, MATTHEWS, *l.c.* Var. *EGLANDULOSA* W.-D. Loch Ranza, Arran, Mrs WEDGWOOD; Milnathort, Fife, MATTHEWS, *l.c.*

941. *R. SHERARDI* Woods. Near Whitby, N.E. Yorks, SNOWDEN, ex BUTCHER.

943. *R. VILLOSA* L. = *MOLLIS* Sm. Ovington, Hants, H. & Miss A. CONYBEARE. The specimen is incomplete, but it almost certainly belongs here. Var. *SUBMOLLIS* (Ley). Glencairn, Dumfries, Fox; Milnathort, Fife, MATTHEWS, *l.c.*; Flotta, Orkney, JOHNSTON. Var. *PSEUDO-RUBIGINOSA*. Teesdale, Durham, 1893, Fox, as *sepium*.

944. *R. POMIFERA* Herrm. St David's, Fife, MATTHEWS, *l.c.*

950. *R. SPINOSISSIMA* L. Hedge garden, Barnham St Gregory, W. Suffolk, H. D. HEWETT & BROWN. The planted form.

954. *PYRUS COMMUNIS* L. Chepstow, Monmouth; Kemble, Bucks, DRUCE.

†959. *P. INTERMEDIA* Ehrh. Banchory, Kincardine; Gairloch, W. Ross, DRUCE; Pilmoor, N. Yorks; by the Garry, Struan, Perth, BUTCHER & FOGGITT.

†972. *COTONEASTER MICROPHYLLA* Wall. Bird sown. In turf on limestone downs near Blore, Staffs, DRUCE; top of S. Downs north of Arundel, Sussex, B. REYNOLDS.

†972. *C. SIMONSII* Baker. Flowerdale, W. Ross; Banchory, Kincardine, DRUCE.

\*982. *SAXIFRAGA GRANULATA* L. On both banks of the Exe both above and below Tiverton, Devon; on the banks of the Burle near Dulverton Station, W. Somerset, Col. G. WATTS.

987. *S. HIRCVLUS* L. Harthope Fell, Weardale; Mickle Fell, Teesdale, FOGGITT.

†1003. *RIBES RUBRUM* L., var. *SATIVUM* (Reichb.). South Burn of Quoys, Hoy, Orkney, JOHNSTON.

†1004. *R. SANGUINEUM* Pursh. Banchory, Kincardine, DRUCE.

\*1006. *TILLAEA MUSCOSA* L. Stapleford Wood, Notts, Miss BACON.

†1007 (10). *TETRAGONIA EXPANSA* Thunb. Salt marsh near Southport, Lancs, T. W. HOLDEN.

†1016. *SEDUM ALBUM* L. Bamborough Castle, Northumberland, DRUCE & Visct. GREY.

†1029. ×*DROSERA OBOVATA* M. & K. Bewley Down, Devon, with its parents, and *D. anglica*, D. WATSON in *Devon Assoc. Rep.* No. 17.

1043. *LYTHRUM SALICARIA* L. Beauly, Easternness, J. A. WEBB.

\*†1045. *L. HYSSOPIFOLIA* L. Burton-on-Trent, Staffs, DRUCE & CURTIS; Heyshot, W. Sussex, 800 feet, TRAPNELL.

1047. *EPILOBIUM HIRSUTUM* L., var. *VILLOSISSIMUM* Koch. Corfe, Dorset, Miss TODD.

1050. *E. LAMYI* Schultz. Bagley Wood, Berks, DRUCE.

\*1053. *E. LANCEOLATUM* S. & M. Fyfield, Essex, T. A. WILLIAMS.

1054. *E. MONTANUM* × *OBSCURUM*. Hailey, Oxon, DRUCE.

1078. *HYDROCOTYLE VULGARIS* L. Ascends to 1750 feet on Tal-y-fan, Carnarvon, WILSON.

†1082. *ASTRANTIA MAJOR* L. In a ditch near Burton-on-Trent, Staffs, CURTIS. Var. *INVOLUCRATA* Koch. Cambuslang, Lanark, GRIERSON.

†1088. *BUPLEURUM FRUTICOSUM* L. Garden escape, Goodrington, near Paignton, S. Devon, F. M. DAY.

1090. *B. ROTUNDIFOLIUM* L. Fawley, Bucks, R. MACKENZIE; arable, High Down, Herts, LITTLE.

†1101. *AMMI MAJUS* L. Lucerne field, Cuxton, Kent, Miss C. STEVENS; garden weed, Edenbridge, Kent, Mr JUSTICE TALBOT.

†1109. *PRIONITIS FALCARIA* Dum. A quantity by footpath from Hemsley to Caistor, E. Norfolk, C. & N. SANDWICH.

1126. *CHAEROPHYLLUM SYLVESTRE* (L.), var. *ANGUSTISECTUM* Dr. Fochabers, Elgin; Strachan, Kincardine; Strath, W. Ross; Beaul, Easternness, DRUCE.

1134. *OENANTHE CROCATATA* L. Loch Awe, Argyll, where a cow was killed from eating it, Mrs GUTHRIE. Var. *TENUIFOLIA* Dr. Heatherleigh, Devon, MASON.

†1153. *HERACLEUM VILLOSUM* Fisch. In some quantity at Dagenham, S. Essex, MELVILLE.

1169. *CAUCALIS NODOSA* Scop., var. *PENDUNCULATA* Dr. Mullion, Cornwall, Mrs KNOWLING.

†1171. *C. LATIFOLIA*. Burton-on-Trent, Staffs, CURTIS; Colchester, G. C. BROWN.

1172. *HEDERA HELIX* L., var. *BOREALIS* Dr. Durham, Fox; Strachan, Kincardine, DRUCE.

1178. *SAMBUCUS NIGRA* L., var. *LACINIATA* L. On waste ground, Dundee, DRUCE & CORSTORPHINE.

1192. *GALIUM BOREALE* L., var. *STENOPHYLLUM* Dr. On sea-sand, Mellon Charles, W. Ross; Teesdale, Durham; Grassington, Yorks; Inchadamph, W. Sutherland; Ballater, S. Aberdeen; Ballantrae, Ayrshire, DRUCE. Var. *DIFFUSUM* Dr. Glen More, Easternness, DRUCE.

1193. *G. OCHROLEUCUM* Wolf. Lawers, M. Perth, GAMBIE PARRY; St Owen's, Jersey, FOGGITT.

\*1198. *G. DEBILE* Desv. Sands of Barry, Forfar, DRUCE.

†1201. *G. TRICORNE* Stokes. Burnham, Somerset, MILLER.

\*1204. *G. ANGLICUM* Huds. Bedford Purlieus, Northants, J. GILMOUR. An excellent addition to the Flora of that county.

†1210. *ASPERULA ARVENSIS* L. Beck Mill, Skirwith, Cumberland, BRITTEN.

†1211. *A. CILIATA* Rochel. Polurrian, near Mullion, Cornwall, *R.I.C.* 103, 1926.

†1218. *VALERIANELLA PYRENAICA* L. Near Aberargie, M. Perth, DRUCE; between Tiverton and Bampton, Devon, brought down the stream from Dalveston, Col. G. WATTS.

†1242. *GRINDELIA SQUARROSA* Dunal. Port Meadow, Oxon, GAMBIER PARRY; Dundee, Forfar, R. & M. CORSTORPINE.

1243. *SOLIDAGO VIRGAUREA* L., var. *ANGUSTIFOLIA* Koch. Loch Maree, W. ROSS, DRUCE; Bunerana, Donegal, FOX. Var. *PLUKENETIANA* Dr., f. *ACUTIFOLIA* Dr. Meal Grudad, M. Perth, F. W. SANSOME.

1248. *BELLIS PERENNIS* L., var. *DISCOIDEA*. Burton Bradstock, Dorset, Miss BARBARA BUCKLER.

1258. *ASTER TRIPOLIUM* L., var. *GLABER* Bolzon. Aultbea, W. ROSS, DRUCE; Castle Gregory, Co. Kerry, TRAPNELL.

1261. *ERIGERON ACRIS* × *CANADENSE* = *E. HULSENI*. Sandy field between Elveden and Icklingham, W. Suffolk, C. & N. SANDWITH.

†1264. *E. BONARIENSIS* L. (*LINIFOLIUS*). Avonmouth, W. Gloster, C. & N. SANDWITH; Giffnock, Renfrew, GRIERSON.

†1264. *E. MUCRONATUS* DC., var. Abingdon stoneworks, by Thames, Berks, DRUCE.

1269. *FILAGO MINIMA* Fr. Luxuriant specimens on the Culbin Sands, Elgin, DRUCE & Miss HAYWARD.

†1271. *ANAPHALIS MARGARITACEA* C. B. Clarke. Strath, Gairloch, W. ROSS, DRUCE.

†1291. *AMBROSIA ARTEMISIFOLIA* L. Silloth, Cumberland, Mrs HEWART, ex BRITTEN.

†1295. *XANTHIUM SPINOSUM* L. Burton-on-Trent, Staffs, DRUCE.

†1302. *HELIANTHUS DIFFUSUS* Sims. Newlands, Glasgow, GRIERSON.

†1311. *BIDENS PILOSA* L. also as the discoid form. Rochdale, Lancs, H. BARTON, ex BRITTEN.

†1315. *HEMIZONIA PUNGENS* Torr. & Gray. Colchester, Essex, DRUCE & BROWN [Nos. 2366, 2367]; Par, Cornwall, THURSTON.

†1317. *H. KELLOGGII* Greene. Burton-on-Trent, Staffs, September 1926, DRUCE & CURTIS.

†1320. *SCHKUHRIA BONARIENSIS* Hook. & Arn. Bristol, W. Gloster, C. & N. SANDWITH.

†1322. *TAGETES MINUTA* L. Avonmouth, W. Gloster, C. & N. SANDWITH.

†1323. *ANACYCLUS RADIATUS* Lois. and *A. CLAVATUS* Pers. Near Glasgow, GRIERSON.

1329. *ACHILLEA MILLEFOLIUM* L., var. *LANATA* Koch. Mellon Charles, W. ROSS, DRUCE.

†1340. *ANTHEMIS COTA* L. Bristol, W. Gloster, C. & N. SANDWITH.

1343. *A. ARVENSIS* L. Burnham, Somerset, MILLER.

†1355. *CHRYSANTHEMUM PARTHENIUM* Bernh. Strachan, Kincardine, DRUCE.

†1362. *MATRICARIA SUAVEOLENS* Buch. Gainsborough, N. Lincs, Dr W. W. SMITH; Hitchin, Herts, 1925, LITTLE; Burton, Staffs, DRUCE.

†1368. *ARTEMISIA CAMPESTRIS* L. Waste ground, roadside, Putney Vale, Kingston Hill, Surrey, Misses L. & M. DRUMMOND.

1369. *A. DRACUNCULUS* L. Blundellsands, Lancs, TRAVIS; Christ Church, Hants, L. B. HALL. Det. THELLUNG.

1380. *A. BIENNIS* Willd. Beaconsfield, Bucks, Mrs WEDGWOOD; Abingdon, Berks, GAMBLER PARRY; Ware, Herts, DRUCE; Burton-on-Trent, Staffs, DRUCE & CURTIS.

1393. *SENRCIO AQUATICUS* Hill, var. *PENNATIFIDUS* Gren. & Godr. Cow Meadow, Northants; Holmsley, S. Hants; Durham; Strath, W. Ross; Esthwaite, S. Lancs, DRUCE.

× *JACOBAEA*, Aultbea, W. ROSS, DRUCE.

1394. *S. JACOBAEA* L., var. *CONDENSATA* Dr. Mellon Charles, W. ROSS, DRUCE.

1396. *S. SQUALIDUS* × *VULGARIS*, with both parents. Gwersyllt, Denbigh, JONES.

\*†1399. *S. VISCOSUS* L. Burton-on-Trent, Staffs, DRUCE & CURTIS.

†1402. *S. CINERARIA* DC. Cliffs above Alum Chine, Isle of Wight, Rev. E. C. CRUTWELL.

†1410. *CALENDULA OFFICINALIS* L. and *C. ARVENSIS* L. Strath, W. ROSS, DRUCE.

1428. *CIRSIUM HETEROPHYLLUM* Hill. Grantown, Elgin, TAVERNER.

1433. *C. ARVENSE* × *PALUSTRE*. Penyvae, Glamorgan, Miss VACHELL.

1446. *SERRATULA TINCTORIA* L., var. *INTEGRIFOLIA* Koch. Near New Ross, Wexford, PHILLIPS & STELFOX in *Ir. Nat.* 78, 1926.

1451. *CENTAUREA NEMOROSA* Jord., var. *PALLENS* (Koch). *C. nigra*, var. *pallida* Wk. & Lange. *C. consimilis* Boreau. Guernsey, Mrs M'CREA.

†1453. *C. MONTANA* L. Fine plants by the Lunan, Forfar, R. & M. CORSTORPHINE.

†1463. *C. MELITENSIS* L. Burton-on-Trent, Staffs, DRUCE; L'Anresse Common, Guernsey, Miss VACHELL, &c.

†1477. *CARTHAMUS TINCTORIUS* L. Waste ground, Manchester, Lancs, Mr JUSTICE TALBOT.

1505. *HIERACIUM PILOSELLA* L., var. *CONCINNATUM* F. J. H. Mellon Charles, W. ROSS, DRUCE.

†1510. *H. PRAEALTUM* Vill., var. *BAUHINI*. Near Hungerford, Berks, HURST.

†1512. *H. AURANTIACUM* L. Galashiels, Selkirk, quite established, Miss HAYWARD & DRUCE; Petersfield, S. Hants, B. J. BROOKS; Kilmalcolm, Renfrew, Mrs WEDGWOOD.

1513. *H. ANGLICUM* Fr., var. *ACUTIFOLIUM* Backh. Heilim Ferry, Sutherland, FOGGITT.

1513. *H. CALCARATUM* (Lint.). Silverdale, Lake Lancs, DRUCE.

1513. *H. CERINTHIFORME* Backh. Near Elphin, W. Ross, DRUCE; Scarsdale, Westmorland, BRITTEN.

1514. *H. LANGWELLENSIS* F. J. H. Smoo, West Sutherland, DRUCE.

1521. *H. GRANITICOLUM* W. R. L. Glen Lui Beg, S. Aberdeen, FOGGITT.

1529. *H. CHRYSANTHUM* Backh., var. *MICROCEPHALUM* Backh. Glen Lui Beg, S. Aberdeen, FOGGITT.

1540. *H. CRINIGERUM* Fr. Melvich, W. Sutherland, DRUCE.

1547. *H. SOMMERFELTI* Lindeb. Llandecwyn, Merioneth, DRUCE, teste ROFFEY.

1550. *H. BRITANNICUM* F. J. H. Humphrey Head, Westmorland, Miss GRENFELL.

1558. *H. SCOTICUM* F. J. H. Cnochan, W. Ross, DRUCE.

1559. *H. PROXIMUM* F. J. H. Berriedale, E. Sutherland, DRUCE.

1561. *H. CLOVENSE* Lint. Ben Vrackie, E. Perth, FOGGITT.

1564. *H. STENOLEPIS* Lindeb. Loch Erribol, W. Sutherland, FOGGITT.
1565. *H. SUBTENUA* (W. R. L.). Trowie Glen, Orkney, JOHNSTON; Scarsdale, Westmorland, BRITTEN.
1568. *H. LUCIDULUM* Ley. Lambridge, Henley, Oxon, DRUCE. Thought by DAHLSTEDT to be allied to *melanolepis*. Symonds Yat, W. Gloster, DRUCE. Thought by DAHLSTEDT to be allied to *lacerifolium* Almq.
1570. *H. VARIICOLOR* Dahlst. Boston Spa, Yorks, BRITTEN.
1571. *H. CILIATUM* Almq. Glen Dole, Forfar, FOGGITT.
1577. *H. RUBIGINOSUM* F. J. H. Reay, Caithness, DRUCE.
1584. *H. SAGITTATUM* Lindeb., var. *LANUGINOSUM* Lönnr. Kettlewell, N.W. Yorks, FOGGITT.
1585. *H. EXPALLIDIFORME* Dahlst. Strachan, Kincardine; Gairloch, W. Ross, DRUCE. DAHLSTEDT and ROFFEY agree.
1598. *H. DURICEPS* F. J. H. Stonehaven, Kincardine, DRUCE. Var. *CRAVONIENSE* (F. J. H.). St Mary's Abbey, Yorks, BRITTEN.
1602. *H. EUSTOMON* Lint. Tenby, Pembroke, DRUCE.
1609. *H. CHLOROPHYLLUM* Jord. Llandrindod, Radnor, DRUCE.
1609. *H. GRANDIDENS* Dahlst. South Molton, N. Devon, FOGGITT; modification at Goring, Oxon, DRUCE; Sussex, Miss COTTES.
1609. *H. DEDUCTUM* Sudre. Russell's Water Common, Oxon, DRUCE; Bylands, Abbey Wise, York, BRITTEN.
1613. *H. LEVIGATUM* Willd. Glen Spean, Westernness, DRUCE.
1614. *H. DIAPHANOIDES* Fr. Crowthorn, Berks, but an unusual form, DRUCE.
1629. *H. TRIDENTATUM* Fr., var. *ACRIFOLIUM* Dahlst. Selham, Sussex, DRUCE.
1632. *H. STRICTUM* Fr., var. *PSEUDAURATUM* Zahn (teste ROFFEY). Killin, M. Perth, Rev. R. J. BURDON. DAHLSTEDT refers it to a modification of *polycomum*. Var. *RETICULATUM* Lindeb. Scrabster, Caithness, FOGGITT. Var. *OPSANTHUM* Dahlst. Glen Lyon, M. Perth, FOGGITT.
1633. *H. LATOBRIGORUM* Zahn. Harlech, Merioneth, DRUCE. DAHLSTEDT says it is very nearly allied to *polycomum* Dahlst.

1637. *H. BOREALE* Fr., var. *VAGUM* (Jord.). Pwllheli, Carnarvon, BAILEY, as *corymbosum*.

1638. *H. UMBELLATUM* L., var. *FILIFOLIUM* Backh. Birkdale, Lancs, BAILEY. Var. *CORONOPOLIUM* Fr. Bohemia, Isle of Wight, STRATTON. Var. *PAUCIFLORUM* Hartm. Carr Bridge, Easternness, FOGGITT. Var. *LINARIIFOLIUM* Wallr. Gilly Tresamble, Cornwall, FOGGITT.

1644. *LEONTODON NUDICAULIS* Banks, var. *LEIOLENA* Bisch. Walton-on-Naze, N. Essex, BROWN. Var. *LASIOLENA* Dr. Swanage, Dorset, Miss TODD.

(The *Taraxaca* have been identified by Herr H. Dahlstedt to whom we are much indebted.)

1645. *TARAXACUM BIFORME* Dahlst. (VULGATA.) Adderbury, Oxon [D.52], DRUCE.

1645. *T. BRACHYGLOSSUM* Dahlst. (ERYTHROSPERMA.) Byfleet, Surrey; Kenfig, Glamorgan; Tenby, Pembroke; Strath, W. Ross; Strachan, Kincardine; Barry, Forfar; Alyth, E. Perth, DRUCE; Clifton, Bristol, TRAPNELL.

1645. *T. CROCEIFLORUM* Dahlst. (SPECTABILIA.) Cothill, Berks, DRUCE.

1645. *T. CYANOLEPIS* Dahlst. (VULGATA.) Clouster Brae, Orkney [2903], JOHNSTON.

1645. *T. DAHLSTEDTHI* Lindb. f. (VULGATA.) Adderbury, probably this The Parks, Oxon, DRUCE.

1645. *T. DILATATUM* Lindb. f. (VULGATA.) Headington, Wolvercote, Oxon; Newtimber, Sussex; Flowerdale, W. Ross, DRUCE.

1645. *T. DISSIMILE* Dahlst. (VULGATA.) Tenby, Pembroke; belonging to this group, Caenlochan, Forfar, 2500 feet, DRUCE.

1645. *T. FAEROENSE* Dahlst. (SPECTABILIA.) Naverbank, E. Sutherland; Fox; Sandhurst, Berks and Surrey, DRUCE; Sedburgh, Yorks, TRAPNELL; near Birsay, Orkney, JOHNSTON.

1645. *T. FULVIFORME* Dahlst. (ERYTHROSPERMA.) Weston-super-Mare, Somerset, DRUCE; Putney, Surrey, Fox; Brighton Downs, Sussex, 1886, Mrs OAKESHOTT; Chesterton, Warwick, 1882, BROMWICH.

1645. *T. HAMATUM* Raunk. (VULGATA.) Bagley, Berks; Byfleet, Surrey; as a modification from Sunningwell, Berks; Pool Bottom, Oxon; Chepstow, Monmouth, DRUCE.

1645. *T. KJELLMANNI* Dahlst. (VULGATA.) Adderbury, Oxon, closely allied to this member of the *Vulgata*, DRUCE.
1645. *T. LACISTOPHYLLUM* Dahlst. (ERYTHROSPERMA.) Headon Warren, Isle of Wight; Coombe Wood, Stow Wood, Oxon; Penally, Pembroke, DRUCE; Seaton Carew, Fox; Sea wall, Colchester [1942], 1922, BROWN; Clifton, W. Gloster, TRAPNELL; Acomb, Yorks, G. WEBSTER.
1645. *T. LAETICOLOR* Dahlst. (ERYTHROSPERMA.) Chesterton, Warwick, BROMWICH, as *udum*; Seaton Carew, Durham, Fox; Adderbury, Oxon; Bamborough, Northumberland, DRUCE.
1645. *T. LAETIFRONS* Dahlst. (VULGATA.) Eday, Orkney [2409], JOHNSTON.
1645. *T. LONGISQUAMEUM* Lindb. f. (VULGATA.) Adderbury, Bletchington, Oxon; Byfleet, Surrey, DRUCE.
1645. *T. MACULIGERUM* Lindb. f. (SPECTABILIA.) Askham, Yorks; Kenfig, Swansea, Glamorgan, DRUCE.
1645. *T. MUCRONATUM* Lindb. f. (VULGATA.) Putney Hill, Surrey, Fox; Colchester, as *forma*; Stanton, Studley, Oxon [DD21, 31, 32], as *formae*, DRUCE.
1645. *T. NAEVOSUM* Dahlst. (SPECTABILIA.) Byfleet, Surrey (a fat form); Chepstow, Monmouth; Burton-on-Trent, Staffs; Barry, Glamorgan, DRUCE.
1645. *T. NORDSTEDTII* Lindb. f. (SPECTABILIA.) High Force, Teesdale, Durham; Cairntoul, 3500 feet, S. Aberdeen, Fox; Knyperley, Staffs, Fox, as *laevigatum*; Sedbergh, York, TRAPNELL.
1645. *T. PALUDOSUM* Schrank, agg. (PALUSTRIA.) Kinlochewe, W. Ross, DRUCE.
1645. *T. POLYODON* Dahlst. (VULGATA.) Oxford [AA82], as a var., DRUCE.
1645. *T. PRIVUM* Dahlst. (VULGATA.) Gt. Bardfield, Essex, Fox, as a *forma*; Adderbury, Oxon; Teesdale, High Force, Durham; Tenby, Pembroke, DRUCE.
1645. *T. SUBLACINIOSUM* Dahlst. (VULGATA.) Byfleet, Surrey; Bletchington [DD34], Stonesfield, Stanton St John, Magdalen College Walks, Oxon; Sunningdale, Berks; Swansea, Glamorgan; Bwylch, Brecon, DRUCE.
1645. *T. TANYLEPIS* Dahlst. (VULGATA.) Bay of Skail, Orkney [2227], JOHNSTON.

\*†1650. *LACTUCA SALIGNA* L. Charlestown, Cornwall, TRESIDDER in *R.I.C.* 1926.

1656. *SONCHUS ARVENSIS* L., var. *ANGUSTIFOLIUS* Meyer. Near this, Malvern Cemetery, Worcester, TOWNDROW.

†1661. *TRAGOPOGON CROCIFOLIUS* L. Splott, Cardiff, SMITH.

1665. *LOBELIA URENS* L. Hinton Amiral, S. Hants, in some plenty, flowering June-September 1926, DRUCE.

1667. *CERVICINA HEDERACEA* (L.) Dr. Bank of a moorland burn near Frosterley, Durham, R. B. CORKE; ascends to 1500 feet on Tal-y-Fan, Carnarvon, WILSON.

†1670. *CAMPANULA MEDIUM* L. Walls of Beaulf Abbey, S. Hants, June 1926, DRUCE.

1672. *C. LATIFOLIA* L. By the Dee, Banchory, Kincardine, DRUCE.

1673. *C. TRACHELIUM* L., and var. *URTICIFOLIA* Farringham, Kent, MARRIOTT.

1675. *C. ROTUNDIFOLIA* L. Mellon Charles, W. Ross, over a very small area, and the first certain record for the vice-county, DRUCE.

†1676. *C. PERSICIFOLIA* L. Naturalised by the Dee at Banchory, Kincardine, GAMBIER PARRY & DRUCE; Beaverdene, Dumbarton, GRIERSON.

†1677. *C. RAPUNCULUS* L. Near Petersfield, S. Hants, B. J. BROOKE.

\*1687. *OXYCOCCUS OXYCOCCUS* (L.). Broadhembury, N. Devon, an interesting addition to the Devon flora, June 1926, Col. G. WATTS.

†1691 (3). *GAULTHERIA SHALLON* Pursh. Naturalised at Flowerdale, Gairloch, W. Ross, DRUCE.

†1691 (4). *PERNETTYA MUCRONATA* Gaudich. About rocks in Glenveagh, Derryveagh Mts., Donegal, F. R. BROWNING.

1692. *ANDROMEDA POLIFOLIA* L. Great Whernside, W. Yorks, FOGGITT.

1697. *ERICA CILIARIS* L. Manaton, Devon, 1911, K. TOMS in *Hb. Eceter*, ex W. D'URBAN.

1703. *BRYANTHUS CAERULEUS* Dippel. Sow of Athol, Perth, more frequent and over a wider area than in previous years, MILLER.

[1705. *LEDUM PALUSTRE* L. Formerly on Flanders Moss between Buckleyvie and Cartmore [Gartmore]. See R. GRIERSON in *Journ. Bot.* 61, 1926. He failed to find it there.]

†1712. *HYPOPHYTES HYPOPHYTES* (L.). Baldhu Plantation, Cornwall, WM. BOYD in *R.I.C.* 105, 1926.

1718. *LIMONIUM RECURVUM* C. E. S. Still at Portland, Dorset, 1926, Miss TODD.

1721. *STATICE PLANIFOLIA* Dr. Rocks above Loch-na-Chat, M. Perth, Miss ALICE COLE.

1726. *PRIMULA VERIS*, Pollination of. In *Journ. Linn. Soc.*, vol. xlvii., p. 367, Mr E. Marsden-Jones records his observations and experiments on the pollination of the common primrose and shows very clearly that (1) Pollination takes place by day and only very rarely at night; (2) The chief agents of pollination are *Bombus hortorum*, *Bombylus* and *Anthophora*; (3) Very few of the flowers exposed by night develop seed whereas those exposed by day had a large number of fertile capsules.

†1731. *CYCLAMEN HEDERIFOLIUM* Ait., and var. *FIGARIFOLIUM* Syme. Plantation, Dunmore, Carrigans, Donegal, F. R. BROWNING.

1732. *LYSIMACHIA THYRSIFLORA* L. Gormire, Thirsk, N. Yorks, flowering freely, FOGGITT.

\*1737. *L. NEMORUM* L. Rozel, Jersey, ARSENE; St Peter's Valley, Jersey, ATTENBOROUGH.

1740. *TRIENTALIS EUROPAEA* L. Very rare in West Ross, some small plants above Braemore; Strachan, Kincardine, DRUCE.

1743. *ANAGALLIS ARVENSIS* L., var. *VERTICILLATA* Diard. Rather a *lusus* than a variety, Crawley, Sussex, Mrs WEDGWOOD.

1745. *CENTUNCULUS MINIMUS* L. In plenty between Noirmont and Portelet, Jersey, with *Myosotis sicula* and *Radiola*, ARSENE. Seen there by the Secretary in 1906.

†1747. *SYRINGA VULGARIS* L. Banchory, Kincardine, DRUCE.

†1751. *VINCA MINOR* L. Woods of Falldon, Northumberland, DRUCE.

1758. *CENTAURIUM CAPITATUM* Dr. Lanresse, Guernsey, Lady DAVY, Miss VIVIAN & FOGGITT.

1763. *GENTIANA AMARELLA* L. Blore, Staffs, DRUCE & CURTIS.

1763. *G. PRAECOX* (Rafn). Aldbourne, Wilts, Miss TODD.

1763. *G. SEPTENTRIONALIS* Dr. Mellon Charles, W. Ross, the prevailing coast-form there, DRUCE.

1765. *G. CAMPESTRIS* L. With large colonies of the var. *ALBA*, Greenyard, W. ROSS, DRUCE.

†1771. *GILIA ACHILLEIFOLIA* Benth. Abingdon, Berks, GAMBIER PARRY; Burton-on-Trent, Staffs, DRUCE. Det. A. THELLUNG.

†1777. *NEMOPHILA INSIGNIS* Benth. Waste ground, Dundee, R. & M. CORSTORPHINE.

†1777. *POLEMONIUM CAERULEUM* L. Garden-stray, Strachan, Kincardine, DRUCE.

†1781. *HELIOTROPIMUM CURASSAVICUM* L. Mortlake, Surrey, B. REYNOLDS.

†1788. *LAPPULA LAPPULA* (L.). (*Echinosperrnum Lappula*.) Beaconsfield, Bucks, Mrs WEDGWOOD; Burnham, Somerset, MILLER; Burton-on-Trent, Staffs, DRUCE & CURTIS; Par, Cornwall, MEDLIN, ex THURSTON.

†1789. *BENTHAMIA (AMSINCKIA) PARVIFLORA* (Heller). Port Meadow, Oxon, GAMBIER PARRY. Det., as probably this, THELLUNG.

†1789. *B. MENZIESII* (Lehm.). Abingdon, Berks, GAMBIER PARRY; Trevemper, Cornwall, THURSTON; Goran Haven, Cornwall, *R.I.C.* 106, 1926; Campbeltown, Argyll, Miss M. BROWN. Devizes, GWATKIN.

†1792. *SYMPHYTUM PEREGRINUM* Ledeb. Aldridge, Staffs, DRUCE.

†1794. *S. TAURICUM* Willd. Well established in an old lane, Malvern, Worcester, COLIN CHRISTIE, ex TOWNDROW.

†1797. *BORAGO ORIENTALIS* L. Near Liphook, Hants, Hon. Mrs Ivo FIENNES.

†1810. *ASPERUGO PROCUMBENS* L. Cherry Hinton, Cambs, BUTCHER & FOGGITT.

1811. *PNEUMARIA MARITIMA* (L.) Hill. Shore of Loch Linnhe, Argyll, CURTIS; between Girvan and Ballantrae, Ayrshire, FOX.

(The *Myosotis* have been revised by Mr A. E. Wade.)

1813. *MYOSOTIS PALUSTRIS* Hill, var. *STRIGULOSA* Reichb. Bullingdon, Oxon; Spiggie, Zetland, with pale flowers, DRUCE; Tunbridge Wells, Kent, 1851, E. C. TOWNSEND in *Hb. Druce*. Var. *CAESPITICIA* DC. Reay, W. Sutherland, DRUCE.

\*1817. *M. SYLVATICA* Hoffm. In abundance on the banks of the Exe between Tiverton and Bickleigh, far from houses or gardens, and seemingly quite wild, Col. G. WATTS.

1821. *M. VERSICOLOR* Sm., var. *DUBIA* (Arrondeau Cat. Pl. Morb.). Flowers passing direct from white to blue. Chalk downs at High Devon, Freshwater, Isle of Wight, E. DRABBLE.

1827. *ECHIMUM PLANTAGINEUM* L. Lustleigh, Devon, Miss TUCKER.

†1831. *VOLVULUS DAHURICUS* (Sims). (*C. SEPIUM*, var. *DAHURICUS* Sims). Alien, Siberia, N. America. Par, Cornwall, 1926, MEDLIN, ex THEURSTON.

\*1833. *CONVOLVULUS ARVENSIS* L. Loch Maree, W. Ross, DRUCE.

†1848. *SOLANUM ROSTRATUM* Dunal. Henfield Common, Sussex, Miss COTTES; Padenham, Lancs, C. R. RITCHINGS.

†1855. *DATURA STRAMONIUM* L. St Ouen's, Jersey, ARSENE.

†1860. *VERBASCUM PHELOMOIDES* L. This appeared as an outcast on Bethel Lane, Hitchin, Herts, 1926, on a U.D.C. dump. See *Rep. B.E.C.* 1055, 1925, LITTLE.

†1864. *V. BLATTARIA* L. Shrubland Park, Suffolk, Hon. Mrs E. WOOD.

1866. *V. LYCHNITIS* × *THAPSUS* = *V. FOLIOSUM* Franchet. Railway bank, St Mary Cray, W. Kent, C. & N. SANDWICH; Friars, Anglesey, MASON.

\*†1873. *LINARIA LINARIA* (L.) Karst. At Strath, W. Ross, doubtless hortat, DRUCE.

†1883. *L. MINOR* Desf. Burton-on-Trent, Staffs, DRUCE & CURTIS.

†1886. *L. PALLIDA* Ten. Airlie Castle, Forfar, R. & M. CORSTORPHINE.

†1889. *ANTIRRHINUM MAJUS* L. In some plenty on the railway-lines at Burton-on-Trent, Staffs, presumably seedling specimens from ballast, DRUCE & CURTIS.

†1890. *A. ORONTIUM* L., var. *GRANDIFLORUM* Chav. Splott, Glamorgan, R. L. SMITH.

†1891. *SCROPHULARIA VERNALIS* L. Burrill, N. Yorks, FOGGITT & Mrs MACALISTER HALL.

1892. *S. AQUATICA* L., var. *PUBESCENS* Bréb. Spital, Chesterfield, Derby; Freshwater, Isle of Wight; by the Thames at Kew, Surrey, E. DRABBLE.

1894. *S. NODOSA* L., var. *BRACTEATA* Dr. Romford, Essex, E. DRABBLE.

1898. *MIMULUS GUTTATUS* DC. Flowerdale and Strath, W. Ross; Strachan, Kincardine, DRUCE. Var. *YOUNGANA* Hook. In great quantity and affording a beautiful sight along the burn above the Clatterin' Brig, Kincardine. Noticed there some years ago by R. & M. CORSTORPHINE.

†1899. *M. MOSCHATUS* Dougl. In a marsh between Flowerdale and the sea, quite naturalised, W. Ross, scentless, DRUCE.

†1906. *VERONICA TEUCRIUM* L. Established on dunes at Birkdale, Lancs, 1926, BRITTEN.

1912. *V. AQUATICA* Bernh. Dovedale, Staffs and Derby, DRUCE.

†1923. *V. TOURNEFORTII* Gmel. Tenby, Pembroke; Gairloch, W. Ross, DRUCE.

†1930. *V. CRISTA-GALLI* Stev. On a hedge bank at Batheaston, N. Somerset, LESTER-GARLAND.

1933. *EUPHRASIA BREVIPILA* B. & G. Strachan, Kincardine, DRUCE.

1939. *E. MICRANTHA* Fr. Strachan, Kincardine, DRUCE.

1960. *MELAMPYRUM PRATENSE* L. Eilean Maree, W. Ross, DRUCE.

1969. *OROBANCHE PICRIDIS* F. Sch. Suckley, Worcester, in its second locality, F. DAVY, ex TOWNDROW.

1974. *LATHRAEA SQUAMARIA* L. On elm at Ro Wen, Carnarvon, Llandudno, Field Club Excursion, ex A. WILSON. Given in *Top. Bot.* on the authority of Robinson, and is another verification of his records of which but few now are unaltered.

(Mr J. Fraser has kindly identified the Mints.)

1988. *MENTHA ROTUNDIFOLIA* Huds. Barry, Glamorgan, DRUCE, MELVILLE & SMITH; escape, Stromness, Orkney, JOHNSTON.

1989. *M. ALOPECUROIDES* Hull, not typical. Greenyard, W. Ross, DRUCE.

1990. *M. NILIACA* Jacq., var. *VILLOSA* (Huds.). Virginia Water, Surrey, MELVILLE & FRASER; Porthqueen, Cornwall, FOX. Var. *NEMOROSA* (Willd.). Sowden Bridge, near Trelawne, E. Cornwall, THURSTON; banks of Chew, N. Somerset, WHITE; Eynsford, W. Kent, GROVES.

†1991. *M. SPICATA* L. Callander, W. Perth; Strachan, Kincardine, DRUCE.

†1993. *M. PIPERITA* L. Stromness, Orkney, JOHNSTON.

1994. *M. AQUATICA* L., var. *ACUTIFOLIA* (Sm.). Aberthin, Glamorgan, Miss VACHELL & DRUCE. Var. *ORTMANNIANA* Braun. Sowden Bridge, near Trelawne, E. Cornwall, THURSTON. Var. *ACUTA* Briq. Aberthin, Glamorgan, DRUCE & Miss VACHELL; Cheltenham, DRUCE; Moor End, W. Gloster, Miss ROBER. Var. *CAPITATA* Briq. St Enodoc Sands, Cornwall; Ayrshire coast, FOX.

1995. *M. PUBESCENS* Willd. Leigh Brook, Worcester, FOGGITT.

1996. *M. VERTICILLATA* L., var. *OVALIFOLIA* Briq. Selkirk, DRUCE & Miss HAYWARD; Dovedale, Staffs, and Derby, plentiful; Whitewell Lydstep, Pembroke, J. ARNOTT; both the British and Welsh specimens had an odour of pure *spicata*; Wynde Park Lake, Hereford, Miss ARMITAGE; Oare, Exmoor, LONG; Ottery St Mary, Devon; Ballantrae, Ayrshire, FOX; Beetly, Norfolk, E. F. LINTON. Var. *ADULTERINA* Briq. Aberthin, Glamorgan, DRUCE & Miss VACHELL; Longford, Derby (*Rep. B.E.C.*, 1890), W. R. LINTON.

1997. *M. GENTILIS* L., var. *VARIEGATA* Sole. Stoneygate, Leicester, BEMROSE. Var. *GRATA*. Skelwith Bridge, Lancs, FOX.

1997. *M. GRACILIS* Sole. Stow Bedon, Norfolk, REYNOLDS & FOGGITT.

†1998. *M. CARDIACA* Baker. Crickley Birdlip, Gloster, HB. DRUCE.

1999. *M. RUBRA* Huds., var. *RARIPILO* Briq. Gwennap, Cornwall, 1911, DAVEY; Holworthy, Devon, Rev. H. HARVEY; Compton Abdale, Gloster, RIDDELSDELL; Shirley, Derby, W. R. LINTON; Ellington, Northumberland, FOX.

2000. *M. ARVENSIS* L., var. *AUSTRIACA* Jacq. Gairloch, Mellon Charles, W. ROSS, DRUCE; Straiton, Ayr, FOX; Bishopstoke, Warsash, S. Hants, RAYNER; Barry, Glamorgan, MELVILLE. Var. *DENSIFOLIATA* Briq. Hamsworthy, Dorset, E. F. LINTON, as *Nummularia*; Summer-town, Oxon, DRUCE; Bruncana, Donegal, FOX. Var. *ALLIONII* (Bor.). Godstow, Oxon, DRUCE.

2001. *M. PULEGIUM* L. Aberthin, Glamorgan, Miss VACHELL & DRUCE.

†2002. *M. REQUIENII* Benth. This Corsican species was found plentifully by streams at about 1000 feet altitude on the northern side of Slieve Gullion, near Newry, J. R. GREEVES in *Ir. Nat.* 141, 1926.

2003. *LYCOPUS EUROPAEUS* L., var. *PUBESCENS* Benth. Near Strath, W. Ross, a very dwarf and a rare species in the county, DRUCE.

\*2007. *THYMUS PULEGIODES* L. Near Malvern, Hereford; Frome, Somerset, V. G. MURRAY.

†2020. *SALVIA AETHIOPIS*. L. Leckwith Common, Glamorgan, Miss VACHELL.

2042. *SCUTELLARIA GALERICULATA* L., var. *LITTORALIS* Dr. Loch Ness, Inverness; Kishorn, Gairloch, &c., W. Ross, DRUCE.

2052. *STACHYS GERMANICA* L. Near Brize Norton, Oxon, 1926, V. E. MURRAY.

2056. ×*S. AMBIGUA* Sm. St John's Vale, Cumberland, MASON.

2092. *PLANTAGO LANCEOLATA* L., var. *ALTISSIMA* L. Barry, Glamorgan, MELVILLE.

\*2103. *HERNIARIA GLABRA* L. Native in gravelly field, Great Salkeld, (not Great Selkirk), Cumberland, H. BRITTEN; near Bexley, Kent, J. TAYLOR. Spec. non vidi. *N.C.A. for W. Kent*

\*†2105. *H. HIRSUTA* L. In plenty on the railway siding and waste ground, Burton-on-Trent, Staffs, DRUCE & CURTIS.

†2110. *AMARANTHUS RETROFLEXUS* L. Bardney, Lincoln, GOULDING.

†2111 (2). *A. ASCENDENS* Lois. Bristol, C. & N. SANDWITH.

†2112. *A. ALBUS* L. Cardiff, R. L. SMITH.

†2113 (2). *A. THUNBERGII* Moq. Abbey Wood, W. Kent, MARRIOTT.

†2114. *A. CHLOROSTACHYS* Willd., var. *ARISTULATUS* Thell. Millbrook, Hants, Miss A. B. COBBE, teste THELLUNG; Dagenham, Essex, MELVILLE.

†2116. *A. SPINOSUS* L., and †*A. SYLVESTRIS* L. Avonmouth, W. Gloster, C. & N. SANDWITH.

(All the Chenopods have been identified by Dr Murr.)

2117. *CHENOPODIUM RUBRUM* L. St Osyth, Essex, Canon VAUGHAN, as *urbicum*; East Grinstead, Sussex, R. S. STANDEN in *Wats. B.E.C.* 1911, as *urbicum*; between Cambwick and Cannington, S. Somerset, 1907 [3208], E. S. MARSHALL, as *urbicum intermedium*. Var. *PSEUDOBOTRYODES* Wats. Sherrard's Green, Worcester, TOWNDROW; Quarry Moor, Ripon, Yorks, FOGGITT.

2122. *C. MURALE* L. \*Burton-on-Trent and Albridge, Staffs, DRUCE & CURTIS; Marazion, Cornwall, Fox, as *rubrum*. Var. *MICROPHYLLUM* Gurke. Bristol, C. & N. SANDWITH.

+2123. *C. OPULIFOLIUM* Schrad. Burton-on-Trent, Staffs, DRUCE & CURTIS; Brighton, Sussex, RAYNER. Var. *OBTUSATUM* Gaud. Crossness, W. Kent; Burton-on-Trent, Staffs, DRUCE; Cheston Bank Station, Northumberland, FOX. Var. *MUCRONATUM* Beck. Burton-on-Trent, Staffs, DRUCE & CURTIS; Barry, Glamorgan, DRUCE.

2124. *C. ALBUM* L., var. *PAUCIDENS* (Murr). N. Surrey, 1867, H. C. WATSON; Burton-on-Trent, Staffs, DRUCE & CURTIS. Var. *SUBFICIFOLIUM* (Murr). Dundee, Forfar, DRUCE & CORSTORPHINE; Burton-on-Trent, Staffs, DRUCE & CURTIS. Var. *VIRIDE* L. Farnham, Surrey, 1867, H. C. WATSON. Var. *GLOMERULOSUM* Reichb. Burton-on-Trent, Staffs, DRUCE & CURTIS; St Helier's, Jersey, DRUCE. Var. *BORBASIFORME* Murr. Studland, Dorset, DRUCE. Var. *LANCEOLATUM* (Muhl.). Colchester [2361], Brown; Abingdon, Berks; Burton-on-Trent, Staffs, DRUCE. Var. *LANCEOLATIFORME* (Murr). Colchester; Burton-on-Trent, Staffs, DRUCE. Var. *VIRIDESCENS* St Am., f. *SERRATO-SINUATUM* Murr. Chobham, Surrey, H. C. WATSON; Melmerby, Cumberland, MASON.  $\times$  *STRIATUM* = *C. PSEUDOSTRIATUM* Zschacke. Barry, Glamorgan, DRUCE, MELVILLE, SMITH & Miss VACHELL.  $\times$  *OPULIFOLIUM*, var. *MUCRONATUM* = *C. PREISMANNI* Murr. Barry, Glamorgan, DRUCE, MELVILLE, SMITH & Miss VACHELL.

+2125. *C. LEPTOPHYLLUM* Nutt. Burton-on-Trent, Staffs, DRUCE & CURTIS.

+2126. *C. FICIFOLIUM* Sm. Dublin, FOX.

\*+2127. *C. GLAUCUM* L. Abundant at Burton-on-Trent, Staffs, DRUCE & CURTIS; Airdrie Coups, Lanark, GRIERSON; Thirsk, Yorks, FOGGITT.

2129. *C. POLYSPERMUM* L. Towersey, Bucks, MASON.

+2130. *C. AMBROSIODES* L. Charleston, Cornwall, TRESIDDER.

+2136. *BETA TRIGYNA* W. & K. Erith, W. Kent, MARRIOTT.

+2153 (10). *AXYRIA* (not *OXYRIA*) *AMARANTOIDES* L. St Austell, Cornwall, TRESIDDER in *R.I.C.* 108, 1926.

2160. *SALICORNIA RAMOSISSIMA* Woods. North Berwick, Haddington; \*Gairloch, W. Ross; Ray Island, Essex, DRUCE.

2163. *S. APPRESSA* Dum. Poole, Dorset, DRUCE.

2163. *S. DISARTICULATA* Moss. Whitstable, Kent, DRUCE; Hayling Island, S. Hants [2510], E. S. MARSHALL, as *pusilla*.

2167. *S. DOLICHOSTACHYA* Moss. Hayling Island, S. Hants; \*Kenfig, Glamorgan, DRUCE.  $\times$  *HERBACEA*. Inverkeithing, Fife, 1848, *Hb. Skene*.

†2168. *SALSOLA KALI* L., var. *TENUIFOLIA* Reichb. Woodbridge, Suffolk, AIRY SHAW, teste THELLUNG.

†2183 (4). *POLYGONUM PATULUM* M.B. Burton-on-Trent, Staffs, DRUCE.

†2183 (5). *P. ARENARIUM* W. & K. Christchurch, Hants, RAYNER.

†2190. *P. PLEBEJUM* L. Bristol, N. Somerset, C. & N. SANDWITH.

†2190. *P. POLYSTACHYUM* Wall. Naturalised on foreshore, Aultbea, and near Poolewe, W. ROSS, probably owing its origin to the garden of Mr Hanbury, DRUCE; solitary plant, Madroc Well, Cornwall, *R.I.C.* 108, 1926.

†2191. *P. CUSPIDATUM* S. & Z. Banchory, Kincardine, DRUCE; Wick Water, Caithness, WEBB.

†2191 (2). *P. SACHALINENSE* Schmidt. Dumbarton, GRIERSON.

2198. *RUMEX CRISPUS* L., var. *UNICALLOSUS* Peterm. Colchester, DRUCE.

2200. *R. OBTUSIFOLIUS* L., var. *AGRESTIS* (Fr.). Earith, Hunts, DRUCE.

\*†2201. *R. SANGUINEUM* L. Clandeboye Demesne, Co. Down, C. D. CHASE in *Ir. Nat.* 98, 1926.

2207. *R. MARITIMUM* L. S. Kipwith, E. Yorks, FOGGITT.

2210. *R. ACETOSELLA* L., var. *MULTIFIDUS* DC. Colchester [2222 & 3], BROWN.

†2210. *R. DENTATUS* Campd. Cardiff, Glamorgan, 1925, DRUCE & SMITH.

†2210 (2). *R. OBOVATUS* Danser. Newport, Monmouth, MELVILLE; Bristol, C. & N. SANDWITH; Lambridge, Oxon, Mrs WEDGWOOD.

†2210 (3). *R. SALICIFOLIUS* W. Burton-on-Trent, Staffs, DRUCE & CURTIS.

†2229. *EUPHORBIA VIRGATA* W. & K. Dagenham, Essex, MELVILLE; near Bix, Oxon, DRUCE; Great Bedwyn, Wilts, HURST.

\*2238. *E. PEPLIS* L. On the shingle near Sandwich, Kent, a solitary specimen, Miss HILDA G. BELTON. Identified by Miss ROBINSON, ex Lady DAVY. Needs refinding to confirm this interesting discovery, which had been previously reported of from between Deal and Sandwich.

2246. *ULMUS PLOTII* Dr. Weston, Notts, DRUCE; Barrington Bridge, E. Limerick, TRAPNELL.

2246. *U. MINOR* Mill. (*STRICTA* Lindl.), var. *WHEATLEYI* Dr. Balderston, S. Notts, DRUCE.

2250. *U. DIOICA* L., var. *INERMIS*. Melmerby, Cumberland, MASON.

\*2261. *QUERCUS ROBUR* × *SESSILIFLORA*. Streetly Wood, Sutton Park, Warwick, with both parents, H. H. BLOOMER. There is a fine *Quercus Robur* on the banks of the Test in Hampshire. At 5 feet from the ground it has a girth of 33½ feet, A. RUSSELL SMITH.

+2265. *CASTANEA CASTANEA* (L.) Karst. Flowerdale, W. Ross, DRUCE.

(The *Salices* have been determined by Mr J. Fraser.)

2268. *SALIX FRAGILIS* × *TRIANDRA* = *S. ALOPECUROIDES* Tausch. By the Avon, Emscote, Warwick, 1870, BROMWICH, as *cuspidata*; New Pool, Malvern, Worcester, 1888, TOWNDROW, as *alba*.

2269. *S. ALBA* L., var. *VITELLINA* (L.). \*Flowerdale, W. Ross; doubtless planted, DRUCE; Pewsey, Wilts, *Rep. Marl.*; Killin, M. Perth, FOGGITT. Var. *CAERULEA* (Sm.). Brandon, Warwick, KIRK; Malvern Link, Worcester, TOWNDROW; Matterston and Kelso, Roxburgh, BROTHERSTON; Aberfeldy, M. Perth, HAGGART & FOGGITT. × *TRIANDRA* = *S. UNDULATA* Ehrh. Putney, Surrey, DE CRESPIGNY, as ? *contorta*. See *Rep. B.E.C.* 232, 1888, when mixed specimens were sent. × *PENTANDRA* = *S. EHRHARTIANA* (Sm.). Brough, Westmorland, FOGGITT. × *FRAGILIS* = *S. VIRIDIS* Fr. Codbeck, Thirsk, Yorks, FOGGITT.

2270. *S. TRIANDRA* L. Corston, N. Somerset, Miss I. M. ROPER, as *hippophaeifolia*. See *Wats. B.E.C.* 1915. Feugh, Kincardine, DRUCE; St Neot's, Beds, 1881, W. R. LINTON, as *alopecuroides*. Var. *HOFFMANNIANA* (Sm.). Leam-bank, Leamington, Warwick, 1866, BROMWICH, as *amygdalina*. × *VIMINALIS* = *S. TREVIRANI* (Spreng.). Bilbrook, Staffs, FRASER, as *hippophaeifolia*.

2271. *S. PURPUREA* L. See *Rep. B.E.C.* 1063, 1925. Mr T. J. Foggitt sent me the small-leaved form (Smith's type) in 1926 from a canal in Surrey. I have never myself seen it wild. There is a bush on the pond in the Cambridge Botanic Garden. As a gardener's product I know it grafted, as Mr Fraser describes, on a standard, so that the boughs droop, in (1) St Mary's Churchyard, Hitchin; (2) garden, White Hill, Hitchin; (3) garden, Pirton Hall, Hitchin, LITTLE. Strath, W. Ross; Banchory, Kincardine, DRUCE. Var. *HELIX* (Sm.). Bilbrook, Staffs, 1888, FRASER; Woodloes, Warwick, 1893, BROMWICH. Var. *LAMBERTIANA* (Sm.). Offord, Hunts, W. R. LINTON; High Force, Teesdale, Durham, Fox (not *genuina*). See *Rep. B.E.C.* 158, 1886). × *VIMINALIS* =

S. RUBRA Huds. Strachan, Kincardine, DRUCE. Var. FORBYANA (Sm.). Carham, Northumberland, Fox.

†2272. S. DAPHNOIDES Vill. Tremethick Moor, Penzance, *R.I.C.* 109, 1926; Swinsty Reservoir, W. Yorks, BUTCHER & FOGGITT.

2275. S. CAPREA L., var. SPHACELATA (Sm.). Glen Shee, E. Perth, Fox; as *cinerea*. × VIMINALIS = S. MOLLIS Sm., non Ehrh. Bank of Ashton Brook, N. Somerset, WHITE, as *ferruginea*. See *Rep. B.E.C.* 158, 1886. Killin, M. Perth, FOGGITT. × REPENS. Lurgie Loch, Berwick, 1876, BROTHERSTON.

2276. S. AURITA L. × VIMINALIS. Howl Hill [? Dorstone], Hereford, A. LEY, as *cinerea*, var. *oleifolia*. See *Rep. B.E.C.* 76, 1882.

2277. S. CINEREA L., var. OLEIFOLIA (Sm.). Shirley, Derby, W. R. LINTON. See *Rep. B.E.C.* 311, 1890.

2278. S. REPENS L., var. FUSCA (Sm.). Glen Luibeg, S. Aberdeen; Ross Links, Northumberland, Fox. Var. INCUBACEA (Sm.). Newton St Faith, Norfolk, E. F. LINTON, as *argentea*; Swansea, Glamorgan, W. R. LINTON.

2279. S. ANDERSONIANA Sm. Rievaulx, Yorks, FOGGITT. × PHYLICIFOLIA. Glen Shee, E. Perth, Fox; Yetholm, Roxburgh, BROTHERSTON, as *cotinifolia*; Shrewley Pool, Warwick, BROMWICH, as *rupestris*; Glen Fiagh, Forfar, DRUCE; King's Dale, W. Yorks, Miss ROPER. × AURITA. Rievaulx, Yorks, FOGGITT. × MYRSINITES. Ben Bhrotan, S. Aberdeen, Fox, as *Damascena*; Loch-na-Lairige, M. Perth, FOGGITT. × AURITA × MYRSINITES. Fortingal, M. Perth, FOGGITT. × CAPREA = S. LATIFOLIA Forbes. Kenmore, M. Perth, FOGGITT.

\*2280. S. PHYLICIFOLIA L. Gairloch, W. Ross, DRUCE.

2283. S. LAPPONUM L. Still on Helvellyn, Cumberland, at 2800 feet, FOGGITT.

†2291. POPULUS NIGRA L. Near Naburn, Yorks, DRUCE.

†2293. P. SEROTINA Hartig. Near Naburn, Yorks, DRUCE.

†2293. P. TACAMAHACCA Mill. Near Naburn, Yorks, DRUCE. × P. MARYLANDICA Bosc. Putney, Surrey, Fox, as *tremula*.

\*2296. CERATOPHYLLUM SUBMERSUM L. Marshfield, Monmouth, WADE.

\*2297. C. DEMERSUM L. Hersoc Lake, Glamorgan, Miss VACHELL; Guernsey, Mrs M'CREA.

2305. LISTERA OVATA Br. A slender form at Mellon Charles, W. Ross, DRUCE.

2306. *L. CORDATA* Br. Strachan, Kincardine, DRUCE.

2310. *GOODYERA REPENS* Br. Alford, N. Aberdeen, W. WILSON; Culbin Sands, Elgin, abundant; Strachan, Kincardine, DRUCE; Wan Fell, Great Salkeld; Heads Nook, near Carlisle, Cumberland, BRITEN.

2311. *EPIPOGON (EPIPOGIUM) EPIPOGON (L.)*. Near Henley, Oxon, found by its original discoverer in the county last July. The two specimens seen by me *in situ* were very small, and the one I cut had only one flower. One root was taken for the British Museum Herbarium.

[2312. *CEPHALANTHERA RUBRA* Rich. Recorded from near Selborne, Hants, but in error, the specimen being a *Helleborine*.]

2316. *HELLEBORINE LATIFOLIA* Dr. A slender form of the aggregate species was sent by Mr J. Nowers, of Darlington, from Baydales, Durham, and Mrs Armitage sent from near Godmersham, Kent, a variegated form which answers to the description of Merrett's plant "*nervo medio candido*;" Falloodon, Northumberland, DRUCE & Viscountess GREY.

\*2316. *H. LEPTOCHILA* (Godf.). Maidenhead, Berks, Col. GODFERY.

2318. *H. PURPURATA* Dr. Duncliffe Wood, Shaftesbury, Dorset, V. E. MURRAY.

\*2320. *ORCHIS PURPUREA* Huds. The Quenvais, Jersey, ARSENE. This corrects my records of *O. militaris*. Last year I only saw leaves and dried up flowers of the plant which some mischievous person had broken off. Brother Arsène's specimen has small flowers, but it is without doubt *purpurea*, not *militaris*. The latter must, therefore, be deleted from the Island flora. Var. ALBA. Near Godmersham, Kent, Mrs ARMITAGE, who sent varied forms.

2325. *O. PRAETERMISSA* Dr. Steep, near Petersfield, Hants, BROOKS; Newton Bowland, Yorks, Miss M. L. PEEL, ex PICKARD; near Aultbea, W. Ross, DRUCE. × *FUCHSII*. Groby, Leicester, BEMROSE; parish of Hambledon, Bucks, DRUCE. Here it is of recent origin. It grows by the side of a pond which has been formed within the last few years. The seeds of *praetermissa* were doubtless wind-borne to this place and a few plants grew which have been fertilised by pollen from *O. Fuchsii* which grows plentifully on the hillside. A couple of strong plants of this beautiful hybrid resulted. It may be added that in the garden of Mr B. S. Ogle, at Steeple Aston, there flowered this year the grandchildren of the original specimen of *O. praetermissa* which was figured as *incarnata* in the *Report of the Ashmolean Society* in 1904. Its offspring flowered in 1913, and from seed of these, plants again blossomed in 1926. They showed no appreciable variation except in stature from their grandparent so that the stability and distinctness of the species is well established. Probably this is the only instance in which such a test has been made with a native Orchid.

2325. *O. PRAETERMISSA* Dr., var. *PULCHELLA* Dr. This northern form—if it is not a distinct sub-species—was plentiful in W. Ross in 1926 at Big Sand and Greenyard; also, as a small form, on the Culbin Sands, Elgin, and at Strachan, Kincardineshire. Also sent from Grantown, Elgin, TAVERNER; Skirwith, Cumberland, BRITTEN; Formby, Lancs, Mr JUSTICE TALBOT; Ballyvaghan, Co. Clare, Lady DAVY & FOGGITT. × *MACULATA*. Skirwith, Cumberland; Patterdale, Westmorland, BRITTEN.

2326. *O. INCARNATA* L. Longmoor, Greatham, Hants, BROWNING; white-flowered plants, Chippenham, Cambs, H. FORSTER; Thetford, Norfolk, LITTLE.

2327. *O. FUCHSII* Dr. St Ola, Orkney, JOHNSTON; Alnwick and Falldon, Northumberland; \*Little Sands, W. Ross, DRUCE.

2327. *O. ERICETORUM* Linton. In great abundance near Brickyard Wood, Wallington Hall, W. Norfolk, 1926; Flitwick Moor, Beds, 1926 (Saunders does not record the segregate), LITTLE. As I have shown the oldest name is *O. maculata* L., older names than Linton's are *O. candidissima* and *O. praecox* Webster, DRUCE.

2327. *O. MACULATA* L., vera. Patterdale, Westmorland, with specimens coming under the var. *macroglossa* Dr., BRITTEN; Beauly, S. Hants; Barry, Glamorgan; Ashdown Forest, Surrey; Strachan, Kincardine; Fochabers, Elgin; Huntly, Alford, N. Aberdeen; Mellon Charles, Aultbea, Longa Island, W. Ross; Culbin Sands, Elgin, DRUCE. Var. *LEUCANTHA* Dr. Drybeck, Westmorland, BRITTEN.

2331. *O. HIRCINA* Sw. Cuddenham, Suffolk (vice *Herminium*), Hon. Mrs E. WOOD.

\*2332. *ACEBAS ANTHROPOPHORA* Br. Totternhoe, Beds, Mrs MARGARET BROWN.

2335. *OPHRYS APIFERA* Huds. Very luxuriant specimens, sent by Miss COTTES, were gathered by Mr C. W. CHICELE PLOWDEN from Eartham, W. Sussex; an albino form was gathered by Miss TODD near Swanage, Dorset.

2338. *HABENARIA GYMNADENIA* Dr. Barry, Glamorgan; Strachan, Kincardine; Mellon Charles, W. Ross, DRUCE. Var. *DENSIFLORA* Dr. Castle Gregory, Kerry, TRAPNELL. × *ORCHIS MACULATA*. Strachan, Kincardine, clearly this hybrid, DRUCE.

2340. *H. VIRIDIS* Br. (*COELOGLOSSUM*). Skirwith, Cumberland, as a pale-coloured form, BRITTEN; Mellon Charles, W. Ross, and the var. *BRACTEATA*, Mellon Charles, W. Ross; Strachan, Kincardine, DRUCE.

2342. *H. VIRESCENS* Dr. Strachan, Kincardine; Mellon Charles, W. Ross, DRUCE; Skirwith, Cumberland, BRITTEN.

2343. *H. BIFOLIA* Br. Grantown, Elgin, TAVERNER; Strachan, Kincardine, DRUCE; drove road near Skirwith, Cumberland, BRITTEN, here forming a few hybrids, *H. BIFOLIA* × *VIRESCENS*. Mr Britten says they were clearly intermediate. Only once have I seen this hybrid, namely, at Sligachan, Skye, where it grew with both parents.

†2363. *TRITONIA CROCOSMIFLORA* Nicholson. Strath, W. Ross, DRUCE.

†2364. *NARCISSUS PSEUDO-NARCISSUS* L., *FLORE PLENO-VIRESCENS*. Fairy Hill Wood, Glamorgan, WEBB.

2382. *RUSCUS ACULEATUS* L. On the rampart ditch of Ramsbury Ring, E. Gloster, Rev. J. H. A. ADAMS.

\*2385. *POLYGONATUM MULTIFLORUM* All. Wood at Noirmont, Jersey, ARSENE.

2388. *CONVALLARIA MAJALIS* L. Rawthey Bridge, Cumberland, TRAPNELL.

†2390. *ASPHODELUS FISTULOSUS* L. Fowey, Cornwall, TRESIDDER; Burton-on-Trent, Staffs, DRUCE & CURTIS.

†2392. *MILLA UNIFLORA* R. Graham (*TRITELEIA*). Pontac, Jersey. See *Rep. B.E.C.* 318, 1921, ARSENE.

†2399. *ALLIUM ROSEUM* L. Beaumont, Jersey, naturalised, ARSENE.

†2400. *A. NEAPOLITANUM* L. Pontac, Jersey, ARSENE.

\*2403. *A. OLERACEUM*. New Ross, Wexford, PHILLIPS & STELFOX in *Ir. Nat.* 78, 1926.

2405. *A. SCHOENOPRASUM* L. On rocks by river, Erwood, Brecon, FOGGITT.

†2406. *A. PARADOXUM* Don. Stream side, Braid Hills, Edinburgh, FOGGITT.

†2407. *MUSCARI RACEMOSUM* L. Beaumont, Jersey, naturalised, ARSENE; near Wilton, Wilts, Hon. Mrs CAMPBELL.

†2408. *HYACINTHUS COMOSUS* L. Par, Cornwall, MEDLIN in *R.I.C.* 110, 1926.

†2411. *SCILLA HISPANICA* Mill. Welbeck, Notts, GOULDING.

\*2412. *ORNITHOGALUM PYRENAICUM* L. Near Paignton, Devon, Mrs THEOBALD. An interesting county record.

\*2422. *COLCHICUM AUTUMNALE* L. Near New Ross, Wexford, PHILLIPS & STELFOX in *Ir. Nat.* 78, 1926.

2428. *JUNCUS CONGLOMERATUS* L. See *Rep. B.E.C.* 455, 1924. Whilst the compact forms of *J. effusus* and *J. conglomeratus* have much general resemblance, one might suggest that the loose form of *J. effusus* does not exhibit the same aspect as that of *J. conglomeratus*. In the latter the flowers are still massed and might, I think, be described as glomerules on stalks of varying length, somewhat resembling those of *Luzula multiflora* (not the var. *congesta*). On the other hand, in the loose form of *J. effusus* the individual flowers stand out much more distinctly in an effuse panicle (Bab.) or cyme (Hooker). I have seen a state of *J. conglomeratus* similar to that described by Mr Mason in the wood behind Parkhurst House, W. Sussex, 1925, LITTLE.

2440. *J. GERARDI* Lois. Port Henderson, W. Ross, DRUCE.

†2441. *J. TENUIS* Willd. Precipice Walk, Dolgelly, Merioneth, Lady DOUIE.

†2450. *JUNCOIDES NEMOROSUM* Morong, var. *RUBELLUM* (Hoppe) Dr. Pallingsburn, Cornhill-on-Tweed, Northumberland, C. M. STRAWBRIDGE.

2465. *SPARGANIUM ANGUSTIFOLIUM* Michx. Gairloch, W. Ross, DRUCE.

2466. *S. MINIMUM* Fr. Gairloch, W. Ross, DRUCE.

2467. *ARUM ITALICUM* Mill. Lane near Dartmouth, S. Devon, in 1925, but no vestige of it in 1926, R. M. MILNE.

2493. *POTAMOGETON GRAMINEUS* L., var. *PAUCIFOLIUS* (Opiz). Loch of Harray, Orkney, JOHNSTON.

2495. *P. NITENS* Web., var. *CURVIFOLIUS* Hartm. Loch of Rango, Orkney, JOHNSTON.

2502. *P. PERFOLIATUS* L., var. *ROTUNDIFOLIUS* Wallr. Loch of Sain-tear, Westray, Orkney, JOHNSTON.

2516. *RUPPIA ROSTELLATA* Koch. Aultbea, W. Ross, DRUCE.

2520. *ZOSTERA MARINA* L. Off the Isle of Longa, W. Ross, the typical plant, DRUCE.

2527. *CYPERUS LONGUS* L. Lymington, S. Hants, GAMBIEP PARRY.

†2527 (2). *C. DECLINATUS* Moench. Gravel pit, Hayes, W. Kent, MARRIOTT.

\*2529. *ELEOCHARIS UNIGLUMIS* Schultes. Melvich, W. Sutherland, July 1925, DRUCE.

2533. *SCIRPUS MARITIMUS* L. Aultbea, W. Ross, rare, also as the var. *MONOSTACHYS* Sonder, DRUCE.

2535. *S. TABERNAEMONTANI* Gmel. Ditches within the tidal bank of the R. Ouse, Stow Bridge, W. Norfolk, 1926, LITTLE; Hell Kettles, Durham, J. E. NOWERS & J. P. NICHOLSON.

2539. *S. PAUCIFLORUS* Lightf. Aultbea, W. Ross, DRUCE.

2545. *S. RUFUS* Schrad. Aultbea, W. Ross, DRUCE. Var. *BIFOLIUS* Wallr. An extraordinary plant coming, W. B. TURRILL says, under this, was found by W. D. MILLER and Mrs MACALISTER HALL on shingle at the Mull of Cantyre, Argyll, with the type into which it gradually passed.

2547. *ERIOPHORUM PANICULATUM* Dr. Gairloch, W. Ross, DRUCE.

2556. *MARISCUS MARISCUS* (L.) Dr. (*Cladium germanicum*). In a small loch near Gairloch, W. Ross, the second locality known in the vice-county, DRUCE.

2557. *KOBBRESIA BIPARTITA* Dalla Torre. At 3000-3500 feet near Meall Garth, M. Perth, MILLER.

2558. *CAREX PSEUDO-CYPERUS* L. N.W. side of St Ouen's Pond, Jersey, ARSENE.

2563. *C. GRAHAMI* Boot. From the classic locality in a corrie off Glen Fiagh, Forfar, July 1926, with FOGGITT & CORSTORPHINE. It is not quite identical with the Breadalbane plant. Although I have marked it with the hybrid sign in the *List* it may be a good species. In favour of this it may be urged that neither of the putative parents is known from Forfar. It occupies a very small area, and it is possible that seeds may have been conveyed thither by birds from Scandinavia rather than that it is a survival of a once commoner plant.

2564. *C. INELATA* Huds., var. *BRUNNESCENS* (And.) Dr. Greenyard, W. Ross, DRUCE.

2565. *C. LASIOCARPA* Ehrh. Lochan na Coille, W. Ross, rare in the vice-county, DRUCE.

\*2566. *C. HIRTA* L. Near Gairloch, W. Ross, DRUCE.

2569. *C. STRIGOSA* Huds. Hackfell, W. Yorks, Lady DAVY & FOGGITT.

2570. *C. HELODES* Link. Ashdown Forest, Sussex, DRUCE; near Presteigne, Hereford, Mrs DEBENHAM.
2573. *C. DISTANS* L. Otter Estuary, Devon, Miss BACON.
2574. *C. PUNCTATA* Lois. Beaufort, Jersey, in quantity, ARSENE.
2576. *C. LEPIDOCARPA* Tausch. Tiverton, Devon, Col. G. WATTS; Budleigh Salterton, Devon, Major ORME.
2580. *C. DIGITATA* L. Hawnby Bank, W. Yorks, FOGGITT.
2581. *C. ORNITHOPODA* Willd. Hutton Roof, Westmorland, FOGGITT.
2592. *C. MAGELLANICA* Lam. Mansergh Bog, Westmorland, FOGGITT, Spec. non vidi.
2593. *C. LIMOSA* L. Amfeur Loch; bog near Kerry Wood, Gairloch, W. ROSS, DRUCE.
2602. *C. AQUATILIS* Wahl. Near Bridge of Dun Station, Forfar, Dr B. P. CAMPBELL.
2608. *C. LEPORINA* L., var. *LONGIBRACTEATA* Peterm. Strachan, Kincardine, DRUCE; Malvern Hills, Worcester, TOWNDROW.
2615. *C. PAIRAEI* F. Schultz. Pendarves, Cornwall, TRESIDDER, ex THURSTON; \*Brigflatts, Sedbergh, Yorks, TRAPNELL.
2616. *C. DIVULSA* Stokes. A very lax form near Edenbridge, Kent, Mr JUSTICE TALBOT.
- \*2617. *C. BOENNINGHAUSIANA* Weihe. Edlingham, Northumberland, FOGGITT.
2619. *C. DIANDRA* Schrank. Pitmoss, Selkirk, BUTCHER, FOGGITT & SLEDGE.
2621. *C. ARENARIA* L. Isle of Longa, W. Ross, with the var. *REMOTA* Marss., DRUCE; between Marazion and Penzance, *R.I.C.* 110, 1926.
2623. *C. DIVISA* Huds. Hayle, Cornwall, Major ORME.
2629. *C. DIOICA* L. Very robust specimens in a bog near Kerry Wood, Gairloch, W. ROSS, DRUCE; \*near Budleigh Salterton, S. Devon, Major ORME. Spec. non vidi.
- †2634. *PANICUM SANGUINALE* L. Waterworks Valley, Noirmont, Jersey, ARSENE.
- †2637. *P. COLONUM* L. Glasgow, Lanark, GRIERSON; Avonmouth, Gloster, C. & N. SANDWITH.

- †2638. *SETARIA ITALICA* Beauv. Dagenham, Essex, MELVILLE.
- †2640. *S. GLAUCA* Beauv. Burton-on-Trent, Staffs, DRUCE & CURTIS.
- †2641. *S. VERTICILLATA* Beauv. Avonmouth, Gloucester, C. & N. SANDWICH.
- [2643. *SPARTINA TOWNSENDII* H. & J. G. Estuary of the Seine, France, Prof. F. OLIVER. See *Gard. Chron.* i., 213, 1926.]
- †2646. *BECKMANNIA ERUCIFORMIS* Host. Burnham, Somerset, MILLER.
- †2653. *PHALARIS MINOR* Retz. Gweek Quay, Cornwall, Major ORME.
- †2654. *P. PARADOXA* L. Galashiels, Selkirk, DRUCE & Miss HAYWARD; Abingdon, Berks, GAMBIER PARRY; Par, Cornwall, DRUCE.
2667. *ALOPECURUS BULBOSUS* Gouan. Barry, Glamorgan, MELVILLE.
2673. *PHLEUM PRATENSE* L. A bracteate form at Strachan, Kincardine, DRUCE.
2684. *AGROSTIS ALBA* L., var. *CONDENSATA* Hackel. Isle of Longa, W. Ross; DRUCE.
- \*†2690. *POLYPOGON MONSPELIENSIS* Desf. Burton-on-Trent, Staffs, DRUCE & CURTIS; Newark, Notts, Miss BACON.
2693. *CALAMAGROSTIS EPIGEIOS* Roth. Ashley Marsh, Isle of Wight, Miss TODD.
2697. *DEYEUXIA* (vel *CALAMAGROSTIS*) *NEGLECTA* Kunth. Allied to this are:—
- D. BOREALIS* (Læstad.). The classic locality is by Loch Tay, M. Perth, where it was discovered by G. C. DRUCE in August 1888, but the plant was destroyed a few years afterwards from the marsh being filled up with saw dust from an adjacent saw-mill. Found in 1917 by J. Fraser by a stream-side near Killin where it still persists; \*Scarmclett, Caithness, 1919; \*Lough Neagh, Antrim, DRUCE.
- D. HOOKERI* (Syme) Dr. Lough Neagh, Antrim, (locus classicus); Watton, Norfolk, DRUCE.
- It also occurs as the colour form, var. *FALLIDA* Ruprecht, with slightly longer callus-hairs.
- Plants near to *Hookeri* grow with *stricta* at Oakmere, Cheshire, S. H. BICKHAM; also possibly as a new variety, Lt.-Col. WOLLEY-DOD, teste R. W. BUTCHER.
- D. SCOTICA* Dr. *CALAMAGROSTIS STRIGOSA* Benn. non Kunth, teste HACKEL. Loch Duran, Caithness, 1885, Fox; do., 1886, F. J. HANBURY; Loch Watten, Caithness, 1887, F. W. WARD; Duran Side, 1903, DRUCE. Well characterised by the more acute glumes. *DEYEUXIA*, nova species.

Loch Watten, Caithness, 1909, DRUCE. To be hereafter described by R. W. BUTCHER.

2707. AIRA PRAECOX L. Ascends to 1940 feet on Tal-y-Fan, Carnarvon, WILSON.

†2719. AVENA STRIGOSA Schreb. Mellon Charles, W. Ross; Fochabers, Elgin, DRUCE. Var. GLABRESCENS (Marq.). Par, Cornwall, R.I.C. 111, 1926.

\*2725. ARRHENATHERUM TUBEROSUM (Gil.) Dr. Strachan, Kincardine; Huntly, N. Aberdeen, DRUCE.

†2727. CAPRIOLA (CYNODON) DACTYLON O.K. Grève de Lecq, Jersey, ARSENE.

†2731. ELEUSINE INDICA Gaertn. Avonmouth, Gloster, C. & N. SANDWITH.

2732. SIEGLINGIA DECUMBENS Bernh. Ascends to 1950 feet on Tal-y-Fan, Carnarvon, WILSON.

†2737. CYNOSURUS ECHINATUS L. Tame Valley Bridge, Staffs, DRUCE & CURTIS; Robroyston, Lanark, GRIERSON; Rievaulx, N. Yorks, FOGGITT.

†2744. KOELERIA PHELOIDES Pers. Airdrie, Lanark, GRIERSON; Gray, Essex, MELVILLE.

†2760. POA PAUSTRIS L. Durham, 1883, Fox, as *nemoralis*.

2762. P. NEMORALIS L. Wall of bridge, Braemore, W. Ross, practically a N.C.R., DRUCE.

2772. GLYCERIA FLUITANS Br. Ascends to 1900 feet on Tal-y-Fan, Carnarvon, WILSON.

2774. G. DISTANS Wahl., var. MILLIACEA (Rouy). Par, Cornwall, R.I.C. 111, 1926.

2776. G. MARITIMA Wahl., var. SUBCAESPITOSA Dr. Hoy, &c., Orkney, JOHNSTON.

2777. G. BORRERI Bab. Climping, W. Sussex, H. H. KEW; Ballinacathy, Waterford, Miss E. BOND in *Ir. Nat.* 96, 1926.

(Most of the Fescues have been named by Mr Howarth.)

2782. FESTUCA ELATIOR × LOLIUM PERENNE = F. ADSCENDENS Retz. Burnham, Somerset, MILLER.

2783. *F. SYLVATICA* Vill. Hackfell, N. Yorks; High Force, Teesdale, FOGGITT.

2785. *F. RUBRA* L. Swaffham, Cambs, 1833, J. S. HENSLow, as *duriuscula*. Var. *FALLAX* (Thuill.). = *MUTATA* Gaud. Gainsborough, N. Lincs, Dr WILLOUGHBY SMITH; Par, Cornwall, *R.I.C.* 112, 1926. Var. *ARENARIA* Fr. Ross Links, Northumberland, Fox; Naver Bank, W. Sutherland, DRUCE. Var. *GLAUDESCENS* (Hack.). Coverack, Cornwall; Seaton Carew, Durham, Fox. Var. *BARBATA* (Hack.). Wimbledon, Surrey, Fox; Craig Cailleach, M. Perth; Deal, Kent; Sands of Barry, Forfar, DRUCE.

\*2786. *F. DUMETORUM* L. (*JUNCIFOLIA* St. Am.). Sandy shore, Hartlepool, Durham, Fox.

2787. *F. CAPILLATA* Lam. Kepier Wood, Durham, Fox. Var. *HIRTULA*. Glen Fiagh, Forfar, DRUCE.

2787. *F. OVINA* L., var. *HISPIDULA* (Hack.). Claremont, Surrey. Var. *VIVIPARA*. Falls of Foyers, Westernness; Teesdale, Durham, Fox; Flowerdale, W. Ross, DRUCE.

†2789. *F. LIGUSTICA* Bert. Burton-on-Trent, Staffs, DRUCE; Gweek, Cornwall, Major ORME, as *Bromus*, *R.I.C.* 112, 1926.

†2794. *BROMUS RIGENS* L. Burton-on-Trent, Staffs, DRUCE & CURTIS; Avonmouth, Gloster, C. & N. SANDWICH.

2797. *B. TECTORUM* L. In some plenty, Burton-on-Trent, Staffs, DRUCE & CURTIS; Avonmouth, Gloster, C. & N. SANDWICH; Airdrie, Lanark, GRIERSON.

†2799. *B. RUBENS* L. Burton-on-Trent, Staffs, sparingly, DRUCE & CURTIS.

†2802. *B. INERMIS* Leysser. On the sands near L'Etac, Jersey, ARSENE; Bristol, N. Somerset, C. & N. SANDWICH.

†2803. *B. UNIOLOIDES* H.B.K. St Clements and Grouville, Jersey, naturalised, ARSENE.

†2806. *B. SECALINUS* L. The short spikeletted form, Worth Matravers, Dorset, Miss TODD.

†2809. *B. ARVENSIS* L. Burton-on-Trent, Staffs, DRUCE & CURTIS.

2819. *BRACHYPODIUM PINNATUM* Beauv. Hambledon, Bucks, DRUCE; on limestone, Went Bridge, W. Yorks, FOGGITT.

†2820. *B. DISTACHYUM* Beauv. Par, Cornwall, MEDLIN.

†2821. *LOLIUM TEMULENTUM* L. Abingdon, Berks, GAMBIER PARRY.

2827. *AGROPYRON JUNCEUM* Beauv., var. *MEGASTACHYUM* (Fr.) Dr. Par, Cornwall, MEDLIN, ex THURSTON. ×*REPENS* = *A. HACKELII* Dr. Greenyard, W. Ross, in absence of *junceum*, which may have previously existed there, DRUCE; Par Sands, Cornwall, MEDLIN.

2828. *A. FUNGENS* R. & S. Type at Stone Point, Walton-on-Naze, N. Essex [2376], BROWN, and [2375 & 2376] smaller forms, from Langueboe in the same vice-county, BROWN. ×*REPENS* = *A. OLIVERII* Dr. Silloth, Cumberland, DRUCE. To this probably belong plants from Strood Peldon, N. Essex [2373], BROWN, which are nearer *repens*.

†2836. *TRITICUM OVATUM* Rasp. Hythe Quay, Colchester [2370], BROWN, teste Prof. PERCIVAL.

†2839. *T. VENTRICOSUM* Ces. Hythe Quay, Colchester [2350], BROWN, teste Prof. PERCIVAL.

†2850. *HORDEUM MARINUM* Huds. Burton-on-Trent, Staffs, DRUCE & CURTIS.

†2851. *H. JUBATUM* L. Beaconsfield, Bucks, Mrs WEDGWOOD.

†2865 (2). *CEDRUS LIBANI* Barr. Lord Ullswater in a letter to "The Times" of April 1, 1926, says the Cedars on his lawn at Campsea Ashe, Suffolk, measure respectively, at 5 ft. from the ground, 21 ft., 20 ft., 19 ft., 18 ft. 5 in., and 17 ft. Mr Bean says they were the finest he had seen in England. The Blenheim Cedars measured by the Duke of Marlborough in 1926 were 28 ft., 24½ ft. and 21½ ft. in girth.

2868. *EQUISETUM SYLVATICUM* L., var. *CAPILLARE* Milde. Dykehead, Cortachy, Forfar, Lady DAVY & FOGGITT.

\*2874. *E. VARIEGATUM* Weber. Borth, Cardigan, D. POWELL in *Journ Bot.* 222, 1926.

2876. *EUPTERIS AQUILINA* Newm., var. *MULTIFIDA*. Burnley, Lancs, C. R. RITCHINGS, ex BRITTEN.

2880. *ASPLENIUM MARINUM* L., var. *PLUMOSUM*. This very rare variety, which had not been seen for half a century, was found by Major ORME at Budleigh Salterton, S. Devon.

2887. *A. GERMANICUM* Weiss. Near Keswick, Cumberland, in a new locality, Miss BACON & FOGGITT.

2900. *DRYOPTERIS AEMULA* Kuntze. Underwood, Port Henderson, W. Ross, DRUCE.

\*2909. *PHEGopteris dryopteris* Fée. Stanford Wood, near Bradfield, Berks, DRUCE.

2918. *OSMUNDA REGALIS* L. Not rare in the north of Jersey; by a rivulet on the Quenvais, ARSENE.

2922. *PILULARIA GLOBULIFERA* L. Dyke, Eastfield, Hickling, E. Norfolk, C. & N. SANDWITH; \*N.W. Denbigh, DALLMAN & WILSON in *N.W. Nat.* 215, 1926.

2929. *LYCOPODIUM CLAVATUM* L. Plentiful a few feet above sea level on the Culbin Sands, Elgin, DRUCE.

\*2933. *NITELLA FLEXILIS* Ag. Plentiful in Llyn Mynydd-y-geer, Glamorgan, Miss VACHELL.

2934. *N. OPACA* Ag. Cannock Chase, Staffs; Gairloch, W. Ross, DRUCE.

2951. *CHARA HISPIDA* L. Hell Kettles, Durham, J. E. NOWERS & J. B. NICHOLSON.

2955. *C. ASPERA* Willd. Ballyvaughan, Co. Clare, O'KELLY; Cannock Chase, Staffs, DRUCE.

\*2955 (2). *C. MUCOSA* G. & B.-W. Loch of Rango, Sandwick, Orkney, JOHNSTON, with *contraria*, *aspera*, and *desmacantha*. A most interesting addition to Britain.

## LE LAUTARET.

BY G. CLARIDGE DRUCE.

One of the most fascinating places in Europe is the Col du Lautaret, both for its scenery and for its very rich botany.

It is now within easy reach of Britain, and is cordially recommended to any one who is anxious to begin the study of the Alpine flora in pure and bracing air amid the high alps. It is situated in the Dauphiny, itself a most fascinating area. An easy day's railway journey from Paris landed us as Grenoble, a delightfully situated and strongly fortified city on the rivers Isère and Drac, once the capital of Dauphiny, now of the Department of Isère. The journey was a pleasant one from Paris to Lyon, but there our carriage was invaded by a crowd of garlic-smelling peasants with, if any, only third class tickets. Their intrusion, however, did not prevent the enjoyment of the fine scenery we passed through ere we reached Grenoble in time for dinner. The environs of the town are pleasing, the rushing Isère bringing a current of cool, fresh air in its wake. The banks of the stream were bordered with many interesting species, among which *Bromus tectorum*, *Lepidium Draba* and *Chenopodium murale* were frequent.

Our first expedition was to visit the Grand Chartreuse—

“ Per invias rupes, fera per juga,  
Clivesque praeruptus, sonantes  
Inter aquas, nemorumque noctem,”

and to follow Matthew Arnold's steps

“ Where thick the Crocus blows  
The mule-track from St Laurent goes.”

Albeit the Crocus may have been the Colchicum. The journey is through wooded glens, by rocky escarpments and bosky dells where *Prenanthes purpurea*, *Impatiens Noli-tangere*, *Sambucus racemosus*, *Salvia pratensis*, *Calamagrostis montana*, *Senecio Fuchsii*, *Lunaria rediviva*, *Bupleurum falcatum*, *Inula Vaillantii*, *Euphorbia dulcis*, *Gentiana lutea*, *Campanula patula*, *C. Trachelium* and *Coronilla varia* were noted. The gorge near St Laurent is singularly fine and is alone worth a visit, the Guier stream rushing and foaming below, while the overhanging precipices give a chance for many a rare plant to survive. We did not feel tempted to go through the Monastery, which is situated at an elevation higher than that of Ben MacDhui, but preferred the wilder surroundings. Returning to Grenoble, we had a fine view of the Grand-Som, 6670 feet. Its slopes appeared to be very precipitous. On one of the lower foothills we obtained beautiful specimens of *Ononis fruticosa*, *O. Natrix* and *Euphorbia verrucosa*. The journey, under sixty miles, by automobile to Le Lautaret is pleasant. It follows the river Romanche, passing through Vizille, Le Bourg-d'Oisans, Le Dauphin and La Grave.

Lavender grows plentifully locally, and bunches of it are offered by the children for sale. There is very grand scenery in the Combe de Malaval, the south side showing the largest glacier in the Dauphiny. La Grave itself is splendidly situated, and here our vigilant members, the Misses Cobbe, stayed for some time in the earlier summer and made a large gathering of plants, including *Aconitum Lycoctonum*, *Arabis Turrita*, *A. brassicaefolia*, *Tunica prolifera*, *Ononis rotundifolia*, *Astragalus purpureus*, *Colutea arborescens*, *Vicia tenuifolia*, *V. varia*, *Lathyrus niger*, *Coronilla Emerus*, *Prunus Mahaleb*, *Spiraea Aruncus*, *Potentilla rupestris*, *Alchemilla glaberrima*, *Amelanchier vulgaris*, *Epilobium rosmarinifolium*, *Pimpinella Tragiium*, *Lonicera Xylosteum*, *L. caerulea*, *L. alpigena*, *Achillea macrophylla*, *Carduus personatus*, *Sonchus alpinus*, *Hieracium florentinum*, *H. staticaeifolium*, *Phyteuma Halleri*, *Campanula persicifolia*, *Legousia Speculum*, *Pinguicula vulgaris*, var. *micrantha*, *Vincetoxicum officinale*, *Myosotis sylvatica*, *Verbascum Lychnitis*, *Digitalis ambigua*, *D. lutea*, *Veronica prostrata*, *V. urticifolia*, *Pedicularis gyroflexa*, *Melampyrum nemorosum*, *M. sylvaticum*, *Orobanche purpurea*, *O. Epithymum*, *Prunella alba*, *Ajuga genevensis*, *Plantago Cynops*, *Globularia vulgaris*, *Chenopodium hybridum*, *Daphne alpina*, *Euphorbia Esula*, *Lilium croceum*, *Hyacinthus comosus*, *Allium Scorodoprasum*, *Paris*, *Unifolium Bifolium*, *Polygonatum verticillatum*, *P. Polygonatum*, *Orchis militaris*, *Cephalanthera pallens*, *Stipa pennata*, *Polystichum Lonchitis*, *Cystopteris alpina* and *Asplenium fontanum*. Above La Grave, on extremely precipitous places, copper mines are worked. The scenery is superb as one ascends the pass of the Lautaret which separates the stream of the Romanche from that of the Guisane. The top is 6869 feet above sea level. Although in August, owing to the cold and mist in the early summer, the beautiful pastures were still uncut and were a Persian carpet in colouring, despite many of the plants being over flower. Conspicuous amongst the flowers, as we revelled in our first ramble, were *Swertia perennis* in magnificent bloom with both purple and white flowerets, *Centaurea montana*, its brilliant blue contrasting with the yellow of *Hypochoeris maculata* (a form, too, with unspotted leaves), *Crepis blattaroides*, *C. aurea*, *Hieracium valdepilosum*, *H. villosum*, *Bupthalmum salicifolium* and *grandiflorum*, *Aconitum Anthora*, *Crepis grandiflora* and *Potentilla delphinensis*. We also gathered *Scabiosa sylvatica*, *Astragalus penduliniformis*, *alpinus* and *aristatus*, *Centaurea uniflora*, *Rumex arifolius*, *Ranunculus aconitifolius*, *Campanula thyrsoides*, *barbata* and *rhomboidalis*, *Onobrychis montana*, *Saxifraga Aizoen*, *Biscutella laevigata*, *Gentiana punctata*, *Veratrum album*, *Solidago monticola*, *Pedicularis tuberosa*, *Phyteuma betonicifolia*, *P. Michellii* and *Papaver alpina*. In many wet places grew *Phleum alpinum*, *Poa alpina*, *Juncus filiformis*, *J. alpinus*, *J. castaneus*, *J. arcticus*, *J. trifidus*, *Epilobium alpinum*, *E. alsinifolium*, *Eriophorum latifolium*, *Veronica alpina*, *Allium Schoenoprasum* and *Juncoides spadicca*. At Le Lautaret each point of the compass affords magnificent views. Westwards is the grand massif of La Meije (13,080 feet), and the

Pic de Combeynot, and southwards is the road leading to Briançon. Eastwards lies the road crossing the Col du Galibier (6790 feet), dominated by the Grand-Galibier (10,637 feet), the precipices of which are so steep that no snow can lie on them, and north-westwards one looks down the road to La Grave above which rises on the left the massif of Mont Pelvoux (12,970 feet). Good botanising lies close to the hotel. Conspicuous are *Trifolium Thalii* (like a strongly caespitose and slender *repens*), *Veronica Allionii* of a glorious blue, *Dianthus neglectus* of a glorious dark pink, *Asperugo procumbens*, *Euphrasia minima*, *Polygonum viviperum*, *Galium erectum*, *Pimpinella magna*, var. *rosea*, *Dryas Geum montanum*, *Astrantia major*, *A. minor*, *Erigeron intermedium*, *Hieracium Laggeri*, *Aster alpinus*, *Rhododendron ferrugineum*, *Semprevivum arachnoideum*, *Oxytropis campestris*, *Calamagrostis montana*, *Poa violacea*, *Festuca pulchella*, *Trisetum distichophyllum*, *Agrostis rupestris*, and *Vesicaria utriculata*. The road leading to Briançon, whence we had a view of the distant Monte Viso, had many treasures, and the banks of the Guisane and the adjacent slopes offered much of interest. In one place we got very locally *Polygala alpina* Perr.-Song., the very rare hybrid, if, indeed, it is not a separate species, and there were *Plantago serpentina*, *Adenostyles leucophylla*, *A. alpina*, *A. albifrons*, *Valeriana montana*, *Rosa pendulina*, *Carex foetida*, *C. Davalliana*, *Kobresia spicata*, *Carex claviformis* (apparently new to the Dauphiny), *Nepeta Nepetella*, *Scutellaria alpina*, *Bartsia lanceolata*, *Cotoneaster*, *Lactuca perennis*, *Brassica Richerii*, *Arabis alpestris*, *Campanula pusilla*, *Linaria repens*, *Satureia alpina*, *Ajuga pyramidalis*, *Rumex scutatus*, *Salix retusa*, *Daphne Mezereum*, *Polygala alpina*, *P. Amarella*, *Saponaria Ocyroides*, *Trifolium spadiceum*, *T. montanum*, *T. alpestre*, *Dianthus sylvestris*, *Catananche caerulea* and *Nigritella*. The Col du Galibier, about 2000 feet above Le Lautaret, afforded a rich harvest, the grassy slopes still having in flower sheets of *Viola calcarata* and three species of *Gentiana*—*nivalis*, *verna* and *bavarica*. There, too, were *Cardamine resedifolia*, *Draba aizoides*, *Arabis alpina*, and var. *crispata*, *Androsace septentrionalis*, *Ranunculus glactalis*, *Gentiana islandica*, *Thlaspi rotundifolium*, *Valeriana tripteris*, *Erigeron alpinus*, *E. uniflorus*, *Senecio incanus*, *Silene acaulis*, *Hutchinsia alpina*, *Anemone alpina*, *Myosotis alpestris*, *Draba carinthiaca* and *Trifolium alpinum*. The Misses Cobbe made a prolonged stay from June to August at Le Lautaret, and their list, in addition to many of the foregoing, includes *Ranunculus pyrenaicus*, *R. montanus*, *Anemone narcissiflora*, *A. vernalis*, *A. baldensis* (Galibier), *Trollius*, *Aquilegia alpina*, *Erysimum hieracifolium*, *E. pumilum*, *Sisymbrium pinnatifidum*, *S. tanacetifolium*, *S. austriacum*, *Arabis bellidifolia*, *Alyssum Alyssoides*, *Draba incana*, *Isatis tinctoria*, *Thlaspi perfoliatum*, *Viola biflora*, *Silene Otites*, *S. rupestris*, *S. nutans*, *S. Vallesia*, *Gypsophila repens*, *Dianthus Saxifraga*, *D. Carthusianorum*, *Arenaria Sedoides*, *A. verna*, *Cerastium arvense*, *Linum alpinum*, *Geranium sanguineum*, *G. rivulare*, *Hypericum Richeri*, *Ononis cenisia*, *Astragalus monspessulanus*, *A. Cicer*, *A. Hypo-*

*glottis*, *Oxytropis lapponica*, *Phaca astragalina*, *Lathyrus luteus*, *L. sylvestris*, *Rubus saxatilis*, *Potentilla aurea*, *Sanguisorba officinalis*, *Alchemilla Hoppeana*, *Epilobium collinum*, *Sedum Anacampscros*, *S. alpestre*, *Sempervivum arvenense*, *Saxifraga rotundifolia*, *Laserpitium Panax*, *L. Siler*, *L. latifolium*, *Meum Athamanticum*, *Peucedanum Ostruthium*, *Bupleurum retundifolium*, *Carum Curvi*, *Homogyne alpina*, *Bellidastrum Michellii*, *Doronicum cordatum*, *Aronicum scorpioides*, *Senecio Doronicum*, *Gnaphalium norvegicum*, *Antennaria dioica*, *Leontopodium alpinum*, *Artemisia atrata*, *Achillea nana*, *Cirsium spinosissimum*, *C. heterophyllum*, *Carduus nigrescens*, *Crepis paludosa*, *Phyteuma hemisphericum*, *Campanula spicata*, *Pyrola rotundifolia*, *Vaccinium Vitis-idaea*, *V. uliginosum*, *Arctostaphylos Uva-ursi*, *Primula farinosa*, *P. latifolia*, *Pinguicula alpina*, *Androsace obtusifolia*, *Soldanella alpina*, *Gentiana tenella*, *Cerinthe minor*, *Lappula Lappula*, *Scrophularia Hoppii*, *Linaria alpina*, *Veronica aphylla*, *V. spicata*, *Pedicularis comosa*, *P. incarnata*, *Stachys recta*, *Dracocephalum Ruyschianum*, *Plantago alpina*, *P. montana*, *Statice alpina*, *Globularia cordifolia*, *Oxyria*, *Rumex alpinus*, *Polygonum Bistorta*, *Daphne striata*, *Thesium alpinum*, *T. intermedium*, *Euphorbia Cyparissias*, *Salix reticulata*, *S. herbacea*, *Tofieldia palustris*, *Lilium Martagon*, *Lloydia*, *Gagea Liotardi*, *Ornithogalum umbellatum*, *Allium Victorialis*, *Paradisica Liliastrum*, *Anthericum Liliago*, *Asphodelus subalpinus*, *Crocus vernus*, *Narcissus poeticus*, *Habenaria viridis*, *H. albida*, *Orchis ustulata*, *O. sambucina*, *O. globosa*, *Luzula lutea*, *L. nivea*, *L. sudetica*, *Schoenus ferrugineus*, *Eriophorum gracile*, *Scirpus compressus*, *Carex curvula* (Galibier), *C. ericetorum*, *C. ornithopoda*, *C. capillaris*, *C. ferruginea*, *C. frigida*, *Sesleria caerulea* and *Melica nutans*. From the Col du Galibier we had a most delightful drive down to St. Jean de Maurienne through woods where *Epipogon* grows plentifully, and thence a most attractive journey to Chamounix led us to that superb northern view of Mont Blanc. On the way we saw many familiar flowers. Nearing Geneva, the road sides were bordered with fruit trees of which the pears were in most abundant fruit. At Geneva we saw the veteran M. Buser, the well-known authority on *Alchemilla*, but he is now nearly deaf and blind, so he is unable to find the specimens I sent him thirty years ago, which are lost in his herbarium. He remembered that they included the first British example of *Alchemilla pubescens*, but he had forgotten the locality. Despite his affliction, he was happy in his surroundings. He seemed to think it remarkable that *A. argentea* Don (*conjuncta*) was a native of Britain. We also called on Dr Beauverd to convey thanks for my election as Corresponding Member of the Botanical Society of Geneva. He showed us the great herbarium of Boissier. The University also possesses the plants of Bouvier, the author of the "Flore des Alpes." On the flat roof, covered with shingle, several hybrids of *Sempervivum* were quite at home, and there were naturalised specimens of an Algerian blue-winged grasshopper quite happy on a soil very similar as regards temperature to that of their African abode.

The first part of the railway journey from Geneva to Paris is by the rushing Rhone, and the scenery is quite interesting. From Paris we flew to Croydon, and thus ended a most enjoyable journey. The memories of Le Lautaret will long be treasured and not without hope of a more prolonged and closer investigation of a flora of such peculiar interest. Verlot's Catalogue Raisonné des Plantes Vasculaires du Dauphine, published by Prudholme, Grenoble, is a comprehensive work, but it lacks descriptions of the species.

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CENTAUREA PRATENSIS THUILLIER.

By C. E. BRITTON.

In previous papers (*Rep. B.E.C.* 163, 1920; 406, 1921; 767, 1922) on *Centaurea*, this species was purposely omitted as it was desired to deal with it apart from its allies, *C. Jacea* and *C. nigra*. It is not a difficult species to identify but there are in existence somewhat similar forms liable to be mistaken for it. It is proposed to print the original description, supplemented by modern accounts by botanists who have made an especial study of the genus, and then to indicate the extent of its present known occurrence in Britain.

I. AUTHORS' VIEWS OF THIS SPECIES.

CENTAUREA PRATENSIS Thuillier.

"*C. calycibus ciliatis erectis et pappo nigricante terminatis, foliis lanceolatis dentato-lyratis.* Vaill. Par. 107.

Habitat in pratis. Flores idem; Julio, Augusto. Centauree des prés. Paroît n'être qu'une variété de la précédente [*C. nigra*]. Feuilles lancéolées et garnies de dents anguleuses et distantes. Cette plante varie par le plus ou le moins de longueur et de largeur de ses feuilles, par leur couleur, par leur circonférence qui est tantôt entière et tantôt découpée. La couleur des écailles est aussi différente. Il y a dents pieds où elles sont terminées par des plumes noires, d'autres par des brunes ou des rouges; et d'autres enfin où les écailles sont dénuées des plumes. Fleurs rouges; en Juillet et Août. Se trouve dans les prés." Thuillier *Fl. de Paris* 444 (1799). Described in such ambiguous terms the species attracted little attention, and it was left to Boreau to bring it into more prominent notice. His description is as follows:—" *Centaurea pratensis* Thuill. Stem from 1 to 5 decim., angular, branched; leaves rough, lanceolate, broad and almost entire in damp places, narrow and cut up in drier localities; peduncles strongly angular, inflated at the summit; capituli large, cylindrical-globular; phyllary appendages blackish-brown, deeply pectinate or fimbriate, imbricate; fruit not pap-pose, but furnished with hairs that exceed the disk and resemble a pap-pus; florets red, the outer rayed, very rarely all equal. Flowers May

to August. Perennial. Rather rare in the centre of France where *C. Jacea* is plentiful, but very common in the west." Boreau, *Fl. du Centre de la France*, ed. 3, p. 354.

The lack of precision of the original description, compared with Boreau's account, has led some botanists to adopt the formula, *C. pratensis* Thuill., *saltem* Boreau. Briquet, in his *Monog. Cent. Alp. Maritim.* (1902), placed this plant under *C. Jacea* as a variety, in that section characterised by the appendages of the lower half, or more, of the capitulum being pectinate. His full description is "Plant 10-80 centim. Stem stout, erect or ascending, rarely decumbent, furrowed, glabrous or more or less hispid but not tomentose, branched above the middle, branches stout, erect or ascending. Leaves green, always rough, the lower long-petioled, lamina oblong-lanceolate, margin entire or sinuate-dentate, rarely pinnatifid, the upper oblong-lanceolate, oblong, or lanceolate, entire, with one or two lobes at base, reduced to teeth in the smaller leaves, sessile. Capituli solitary or sometimes two at the apices of the branches. Pericline ovoid-globular, medium, appendages usually almost entirely covering the phyllaries; appendages ovate-lanceolate, all pectinate-ciliate, or at least pectinate-ciliate in the lower three-fourths or half of the pericline, with teeth scarcely exceeding the breadth of the disk, the upper scarious appendages only incised like those of var. *vulgaris*. Outer florets usually rayed and sterile. Fruits epappose, but sometimes with a rudimentary pappus present on the fruits from the centre of head. Flowers June and July, lingering on into the autumn in elevated localities."

Briquet adds that var. *pratensis* occupies an intermediate position between var. *vulgaris* (which has orbicular, concave, irregularly incised appendages) and var. *nigra* [*C. nigra*] differing essentially from the first, of which it has the habit and fruit, by the appendages being almost all pectinate-ciliate. *Nigra* has heads always larger and more spherical, with teeth blackish, shortly plumose, much longer than the disk, and fruits with a pappus almost about one-sixth its length. All these characters are easy to verify on typical forms of *C. nigra*, but, he adds, it is quite certain that there exist intermediate forms between var. *pratensis* and *nigra*, in which the characters previously given are not easy to verify. As regards the length and colour of the teeth of the appendages numerous intermediates connect *pratensis* and *nigra*.

The description given by Rouy (*Fl. Fr.* ix., 124) shows various points of disagreement with the accounts of Boreau and Briquet, and will not be quoted here. For comparison, the most recent view of *C. pratensis*, that of Hayek in "Kritische Studien über den Formenkreis der *Centaurea Jacea* L.," in *Verh. K.K. Zool. Bot. Gesellsch.* 1917/8, will be given. It should be noted that in the paper in question, the following species are recognised:—(1) *Jacea*, including nine sub-species; (2) *dubia*, with four sub-species; (3) *pratensis*, with one forma, and, (4) *nigra*, with sub-species *eunigra*, *aterrima*, and *nemoralis*.

*C. pratensis* Thuill. is thus described:—"Stem erect, about 80 centim., angled, branches not conspicuously elongated. Leaves green,

slightly hairy, ovate-lanceolate to lanceolate, the lower with distant cartilaginous teeth, lamina of the basal and lower leaves entire or sinuate-pinnatifid, narrowed into the petiole, the upper leaves sessile, base narrow or rounded. Capituli solitary; pericline ovoid-orbicular or orbicular, 14-16 mm. in dia.; appendages roundish, only shortly acuminate, imbricate, the lower and median regularly pectinate, teeth 10-14 on each side, about 2 mm. long, blackish or less commonly brown, equalling or exceeding the dark-brown or blackish ovate-lanceolate disks, succeeding appendages with teeth more or less united, the uppermost appendages roundish, entire or incised. Florets crimson-purple, marginal neuter, enlarged, radiate. Fruit 3 mm. long, grey, finely pubescent. Pappus seldom absent, usually consisting of a few short bristles. France. Piedmont. Switzerland. Western Germany, especially in the distribution area of *C. nigra*, into which it passes, as in the *Alpes Maritimes*." The writer adds that he would like to call especial attention to its as being in appearance a true, constant intermediate between *Centaurea Jacea* and *C. nigra*. The point of view, however, that would consider *C. pratensis* to be a hybrid between these two species is not approved. Hayek says that the evidence is against the assumption that all forms placed here are of hybrid origin, and, quotes with approval the view of Wirtgen, that it is exactly intermediate between *C. Jacea* and *C. nigra* and, although it is not to be taken for a hybrid of these species, forms of it approach close to *C. Jacea* and other forms are near to *C. nigra*. That it may be a descendant of a hybrid between the species named is admitted as a not unreasonable view.

## II. ITS DISTRIBUTION IN BRITAIN.

The earliest date known to me when the name *C. pratensis* Thuill. was first applied to a native plant was in the year 1870 when, on the 10th November, at a meeting of the Botanical Society of Edinburgh, Mr J. Sadler exhibited specimens identified by him as *C. pratensis*, which he had found growing near Forgardenny in Perthshire. A specimen of this gathering is in the Herb. Brit. Mus., and it appears to be correctly named.

The late F. Townsend in *Fl. Hampsh.* 211, 1904, wrote—"A rayed form which I take to be *C. pratensis* Bor., occurs in all the sub-districts of district iv." This conclusion is somewhat qualified by the author's previous remarks that he was unable, with any degree of satisfaction, to differentiate the Hampshire forms of *C. nigra* in accordance with those described by the French botanists. I have not discovered that Townsend distributed this "pratensis," and have failed to find in his herbarium any form at all like *C. pratensis*, and cannot apply the name to other plants seen from the county.

Plants that agree in all essential points with *C. pratensis* Thuill., as described by the authors whose accounts have been quoted, occur in Britain. They are usually robust plants, well-branched, with the branches for the most part simple, the capituli orbicular, orbicular-ovoid or ovoid, with appendages closely imbricate, never black, but dark to

lighter brown, deeply pectinate in the lower two-thirds or three-fourths of the pericline, with disks lanceolate, elliptical, or ovate, with teeth 2-3 mm. long. The upper series of appendages are coarsely fimbriate or incised. The heads are usually very showy with widely-spreading marginal radiate florets.

Although, as stated, this species does not present any difficulty in its recognition, yet the acknowledged existence of intermediate forms connecting it on one side with *C. Jacea* and, on the other, with *C. nigra*, may cause observers to mistake for *C. pratensis* some of these transition forms. If we may safely place these to one or other of its allies, then the position of the species is better defined. Where this species occurs in this country it is often accompanied by forms showing phyllary-appendages lacerate or fimbriate rather than pectinate, which would seem better placed as fringed varieties of sub-species of *C. Jacea*. The connecting forms with *C. nigra* (or, rather *C. nemoralis*) occur chiefly, but not exclusively, in localities where *C. pratensis* is absent. The plants alluded to are some of those showy radiate forms from our chalk downs and limestone hills in the south and west of England which do not seem sufficiently distinct from *C. nemoralis* or *C. Drucei*.

*C. pratensis*, as described by the authors quoted and, also, it may be pointed out, in full agreement with the figure of this species given in the *Flore Descrip. et Illust. de la France*, of Coste, ii., 391, has been found in the following vice-counties:—

- V.-c. 14, Sussex E.—Seaford, 1913, 1914, Miss BRAY in Herb. C. E. Salmon; Wilmington, T. HILTON in Herb. Brighton Mus.
- V.-c. 16, Kent W.—Crossness, A. H. WOLLEY-DOD; Upper Halling, A. H. WOLLEY-DOD (see *Fl. Kent*); Shorne Marshes, W. R. SHERRIN.
- V.-c. 17, Surrey—Claygate, 1875, H. C. WATSON in Herb. Kew (as *C. nigra*, var. *radiata*), among clover [introduced?]; Leatherhead (non-radiate), C. E. B.; Woldingham, C. E. B. (see *Rep. B.E.C.* 825, 1919.
- [V.-c. 22, Berks.—Wellington College, C. E. B. Introduced.]
- V.-c. 24, Bucks.—Knaphill [Naphill], 1896, G. C. DRUCE.
- V.-c. 34, Gloucester W.—St Vincent's Rocks, 1846, G. H. K. THWAITES in Herb. Kew (as *C. nigra*, v. *nigrescens*).
- V.-c. 58, Chester—Bollington, E. S. MARSHALL. 1895 (as *C. nigra*, var. *pallens* Koch).
- V.-c. 88 or 89, Perth—Forgandenny, 1870, J. SADLER in Herb. Brit. Mus.
- Channel Islands—Guernsey, W. C. BARTON.

A variation with rayless capituli (f. *eradiata* Hayek) occurs in Surrey, where are also to be met with plants scarcely distinguishable from Portuguese specimens of *C. rivularis* Brot. which is very closely related to *C. pratensis* if, indeed, specifically distinct.

## THE EVOLUTION AND CLASSIFICATION OF FLOWERING PLANTS.

By JOHN PARKIN.

Not until after the publication in 1859 of Darwin's convincing work, *The Origin of Species*, could the classification of plants and animals be said to have reached the status of a science. The vague idea of affinity prevailing under the retarding influence of the dogma of the constancy of species was seen in the acceptance of the evolutionary origin of living forms to be none other than that of blood-relationship. The aim or ultimate goal of classification then became clear, namely, the arrangement of plants and animals according to their descent or evolution. The task before the systematist soon revealed itself as not so easy of accomplishment as it looked in the first flush of the new enlightenment. Owing to numberless extinctions in the past the gaps soon rose to greater prominence than the connecting links, and though these former have here and there been bridged since by the help of fossils, the imperfection of the geological record, one imagines, must ever be a bar to the complete realisation of the phylogenetic tree. At the same time it is well to bear in mind the imperfection of our knowledge of this record. Only a fraction of the fossiliferous rocks have as yet been thoroughly examined.

Respecting plants it has been aptly said that the brilliant discoveries in fossil botany made in recent years, from the time of Williamson onwards, have raised more problems than they have solved. This is equally true of the latest discovery of first-class importance, viz., Angiospermous fruits of Jurassic age, due to Dr Hamshaw Thomas, and named by him, the Caytoniales.\* We are still very much in doubt as to the mode of evolution of the higher (vascular) plants. It is an open question whether they have had a single or multiple origin from the Algae, their presumed progenitors. Within the vascular plants themselves, the origin of the true Flowering Plants (Angiosperms), the outstanding puzzle in Darwin's time, remains almost as mysterious as ever; though the discovery and elucidation of certain fossil fructifications since, have permitted definite speculations to be advanced.

The rocks, so far, have given no clue as to which group of Flowering Plants may be deemed the oldest. Monocotyledons and Dicotyledons have been traced back to strata of almost equal antiquity. In fact, at present, there is no complete evidence of the existence of true Flowering Plants before the Cretaceous epoch, though their presence on the earth in the Jurassic age at least is to be inferred. In the Cretaceous rocks they appear as it were suddenly with world-wide distribution and multiplicity of form. As far as the investigation of these Cretaceous Angiosperms has gone no family has been distinguished which does not exist at the present time, and the genera too seem much the same. The American palaeobotanist, Professor E. W. Berry, however, from his

\**Phil. Trans. Roy. Soc., B*, Vol. 213, p. 299, 1925.

recent studies considers that the difference between the Upper Cretaceous and Eocene Angiosperms has been underestimated in the past.\* One point is fairly clear that these early Dicotyledons were very largely of the poly—and apetalous types. The Sympetalae (Gamopetalae) in the main probably evolved later in Tertiary times. Here again this assumption may require some modification. Professor Cockerell has recently drawn attention to the discovery of a labiate calyx in the Eocene, and remarks that "evidently we must look in the Mesozoic for the origin of the Labiatae!"† This is interesting, if not disconcerting, for Hutchinson regards this family as the *dernier cri* of the Dicotyledon. Still there is a consensus of opinion that on the whole the Sympetalae represent the highest group, recognising at the same time their multiple (polyphyletic) origin from the Polypetalae. At present comparative evidence is the only basis on which to form any opinion as to the relative primitiveness of the poly—and apetalous types of flower. Just as Monocotyledons and Dicotyledons have been traced back to rocks of an equal age, so have magnolias and catkin-bearing trees.

Turning to the history of Classification as it affects the Flowering Plant it is unnecessary to dwell in detail on the pre-Darwinian period. The narrative centres chiefly round the two opposing methods of arrangement, known respectively as the artificial and natural systems. The one culminated in the famous sexual system of Linnaeus, which for a long time dominated systematic botany, and was only gradually and all too slowly ousted by the natural system, associated especially with the names of Jussieu and De Candolle. Linnaeus himself was aware that his ingenious artificial system based upon single characters often separated widely plants which had flowers obviously built upon the same plan; but such a system had necessarily to be applied rigidly, otherwise it would fail of its purpose. Not so with the natural system. Even though for purposes of general demarcation the single-character-criterion was used, *e.g.*, the corolla for the three main divisions of the Dicotyledons, it was not applied strictly, so as to do violence to obvious affinities. For instance, *Bocconia* without a corolla was placed with the Papaveraceae and not in the Apetalae, and *Correa* with united petals with the Rutaceae and not in the Gamopetalae.

It is well to keep these two methods of classification distinct in one's mind. The student may think that the artificial system is now merely a matter of history, but it is not so. It still has its value and is largely employed at the present day by systematists in the form of keys. One might call this system an art—a device in fact for the easy identification of plants; whereas the natural system is a science—the endeavour to arrange plants according to their evolutionary history or phylogeny. Mr Hutchinson of the Kew Herbarium has rendered systematic botany and the study of the flower good service in the publication of his recent

\**Nature*, Vol. 117, p. 804, 1926.

†Letter to *Nature*, Vol. 118, p. 696, 1926.

work, *The Families of Flowering Plants*, Vol. i., Dicotyledons. In this he not only arranges the Dicotyledons according to what he considers may have roughly been their course of evolution; but has also invented an artificial key to these families. The greater one's botanical knowledge the more advantage one can take of the natural (phylogenetic) system and the less need of the artificial one. The unlearned in botany who merely wants to find the names of flowers he comes across requires an easily applied artificial system. Mr Hutchinson's Key to the Dicotyledonous families (to be obtained separately) will be found of much use to plant-collectors and foresters working in the tropics and in regions little explored botanically. In this country where the families (natural orders) are comparatively few and circumscribed such a Key is not so needful. On the other hand, to those who take a genuine interest in the evolution of the flower and the relationship between one family and another, the phylogenetic distinction from the descriptive part of his book should make a strong appeal.

Considering the stimulus given to Biology generally by the acceptance of the mutability of species, it is a little strange that no immediate attempt was made to picture the evolution of the flower, and to place thereby the classification of the Angiosperms on a professedly phylogenetic basis. The system of De Candolle, adopted with modifications by Bentham and Hooker in their great work, the *Genera Plantarum*, contains what we think is the germ of a true evolutionary classification; even though there is evidence to the effect that these systematists did not regard their arrangement as phylogenetic. It was more perhaps as a happy chance that they commenced the Dicotyledons with the Ranalian families, such as Ranunculaceae, Magnoliaceae, etc.

A move really in the right direction was made as long ago as 1843 by Brongniart who suggested that the Apetalae (Monochlamydeae of De Candolle) could be regarded as degenerate forms of the Polypetalae. Looking back it is odd that this fertile idea was not embraced to the full. It was accepted in cases where it was fairly plain that the apetalous condition had arisen through the abortion of the petals, as, e.g., in the Chenopods; but in instances where direct connections with petalous families were not manifest, the assumption was made that such plants were primitively apetalous, or naked if the perianth was wholly lacking. At any rate such are the inferences to be drawn from the works of Eichler and Engler—the commanding figures in floral morphology and taxonomy of the last quarter of the 19th century.

There were certain reasons then which have little weight to-day, for postulating the primitive nature of the catkin-flower and of other similar flowers of an apetalous character. It was generally recognised that of all extant gymnospermous plants, the Gnetaceae, composed of the three isolated genera, *Ephedra*, *Welwitschia* and *Gnetum*, come nearest the Angiosperms; and if any direct relationship exists it is to be found among the Apetalae. Several ingenious attempts have been made to connect the Gnetacean fructification with that of the catkin-

bearing trees, but all have proved unconvincing. Treub's notable discovery of chalazogamy\* in *Casuarina* was treated at first of primary phylogenetic importance and influenced Engler's classification for a time. Chalazogamy now can only be considered of minor taxonomic value, and is most likely not a primitive but a secondary feature. This together with the improbability of establishing direct relationship between the Gnetales and any apetalous family, undermines very largely the supposed primitiveness of the amentiferous flower. In consequence we think no further usefulness is served by placing these trees at the commencement of the Dicotyledons, as still prevails in Engler's system.

In the attempt to arrive at a comprehensive and rational theory respecting the evolution of the flower, it is necessary to come to a decision as regards the naturalness of the group, Angiospermae, itself; or in biological terminology to decide whether the Flowering Plants as a whole, including both Dicotyledons and Monocotyledons, should be viewed as a monophyletic or polyphyletic assemblage. Respecting the opposed group, the Gymnospermae, a polyphyletic origin is decidedly indicated. The Conifers and Cycads have little in common, and the Gnetales are a group quite apart. On analogy it might therefore be thought that the Angiospermae are of mixed stock. The writer, however, has little hesitation in declaring for a monophyletic origin of Flowering Plants as a whole—at any rate this would seem to be the more helpful and stimulating position to assume. To reduce the various types of sporophylls to be found in the Gymnosperms to one basic pattern for each sex is difficult, but it is otherwise with those of the Angiosperms. The same kind of stamen (microsporophyll) exists throughout the group, and this, though not quite so obvious, may be held equally true for the carpel (megasporophyll). In addition, what is perhaps still more significant, the male and female gametophytes (pollen-grain and embryo-sac) have likewise a similar structure throughout. The chance, one imagines, is remote of two or more independent evolutionary lines converging to such a degree as to reveal no essential differences in their sporophylls and gametophytes.

The acceptance of the monophyletic position envelopes Engler's classification in difficulties. On this arrangement the general evolutionary trend is held to be from flowers with no perianth through ones with a simple sepaloid perianth to ones with both calyx and corolla. A comparative survey fails to show how the perianth arises. Refuge can only be taken in the feeble idea that it has arisen *de novo* as a sudden outgrowth from the floral axis. Again following Engler we are almost forced to the difficult supposition that the unisexual can give rise to the hermaphrodite flower, as most naked flowers, those of the Amentiferae for example, are unisexual. There is no conclusive evidence that anything of the kind has occurred. On the contrary there is overwhelming evidence of perianth reduction to complete abortion, and also of unisexual flowers arising through the suppression of one set of sporo-

\*Entry of the pollen-tube into the ovule by way of the chalaza instead of by that of the micropyle.

phylls (stamens or carpels). No botanist, I fancy, would attempt to read the evidence the opposite way, as, for instance, to suggest that the naked flower of our native ash represents the primitive state in the genus, *Fraxinus*, or that the flower of *Lychnis dioica* is primitively unisexual. Then one may ask why maintain the primitiveness of unisexual and apetalous or naked flowers, when as it happens there are no obvious links connecting them to hermaphrodite and petalous forms. May not the transitional forms have become extinct? Imagine our native ash as the sole survivor of the family, Oleaceae, would not Engler and his followers have been inclined then to regard its flower as primitively naked?

The fact that apetalous or naked flowers are, as a rule, grouped together in dense and often complicated inflorescences—witness the catkin—is worthy of emphasis. Such flower clusters can hardly be deemed a primitive method of arrangement. Some years ago the writer\* endeavoured to show that the evolution of the inflorescence could be based on the view that the primitive arrangement (at any rate for trees and shrubs, which are broadly considered now to have preceded herbs) was that of solitarily disposed flowers, each terminating a leafy shoot. Clustering initially arises from the emission of lateral flowers from the leaf-axils below the terminal flower. As the inflorescence increases in complexity, the individual flower not only decreases in size, but also in the number of its parts. In very compact clusters the calyx tends to vanish or changes its function (cf. Compositae) as the bracts can now act as the protective organs. In the substitution of wind for insect pollination there is no need for petals, so these disappear. Thus can be derived an inflorescence of the catkin type, which practically functions as a single flower. Respecting the evolution of floral clustering, it is significant that solitary flowers terminating shoots are especially characteristic of the Magnoliaceae, which, from the position taken up in this article, are considered to have also the most primitive flowers.

There is plenty of evidence among existing flowering plants of the substitution of wind-pollination (anemophily) for that by insects (entomophily). When this takes place, as already mentioned, the petals abort as being no longer needed. It requires no great stretch of imagination to suppose that the amentiferous trees—so well adapted for wind-pollination—had originally entomophilous ancestors. In fact, it would appear in the present state of our knowledge to be a legitimate hypothesis to hold that Angiosperms, in contrast to Gymnosperms, were primitively entomophilous, and that all wind-pollinating true Flowering Plants now existing have descended from entomophilous ancestors. Indeed, the view may be put forward with a degree of probability that the insect-method of pollination was that prime factor in shaping the primitive Angiosperm, and in marking off the group so clearly from the rest of the higher plants. Such a theory harmonises with the position already taken up, which is based on comparative floral morphology, that the

\**Journ. Linn. Soc.* xlii., p. 511, 1914.

primitive Angiosperms had hermaphrodite flowers. On the supposition that pollen preceded honey as the attraction to insects no benefit would accrue to the plant if its flowers were unisexual, as only the male ones would be visited. It is interesting to note that the Gymnosperms (Cycads and Conifers) which are wind-pollinated and probably primitively so, have unisexual fructifications, and that also the drift in this direction is very marked among anemophilous Angiosperms.

The invariable nature of the sequence of the stamens and carpels on the floral axis has not, owing to its familiarity, created the interest it perhaps deserves. The carpels are always borne morphologically above the stamens. No flower is known with the reverse sequence. Accepting the definition of a cone (strobilus) as an axis of limited growth closely beset with sporophylls, the flower can be visualised as arising from a bisexual cone. A strobilus of this kind hardly exists among Gymnosperms. The Conifers (except in the case of freaks) have unisexual cones, likewise the Cycads. The Gnetales are distinctly interesting in this connection. *Ephedra* and *Gnetum* have unisexual "flowers," but *Welwitschia* has the male flower structurally hermaphrodite, arranged on the Angiospermous plan. Respecting vascular plants below the Spermophyta (Phanerogamia) cones are to be found among the fossil Horsetails (Calamites) and Lycopods, and also in the existing genus, *Selaginella*. In these, strangely, the two kinds of sporophylls have the reverse position on the axis to that found in the Angiosperms, viz., megasporophylls below and microsporophylls above.

Considerable interest was aroused when Wieland, at the beginning of the century, elucidated the morphology of the fructification of those cycad-like Mesozoic plants, the Bennettitales. The structure was shown to be that of a bisexual strobilus with the two kinds of sporophylls obeying the Angiospermous sequence. Further, the cone was subtended by a protective perianth of bracts. A special name, *anthostrobilus*, was given to this kind of cone on account of its flower-like appearance. To derive the Angiosperms from such a group was tempting, but the character of the female part of the Bennettitean cone bars effectually any direct derivation. It does not preclude, however, the possibility of the Bennettitales and the ancestors of the Angiosperms proceeding from common stock with a generalised form of anthostrobilus. This speculation, sometimes termed the Bennettitalean theory of the origin of Angiosperms, but perhaps better the strobilate theory of Angiospermous descent, brings within one wide circle of affinity all plants known having the anthostrobilate form of fructification, viz., the Bennettitales, the Angiospermae, and the Gnetales. It is interesting that the last of these three groups can find within this theory a resting place. The male flower of *Welwitschia* structurally hermaphrodite points the way and indicates that the Gnetales arose from ancestors with bisexual flowers. They are regarded as a remnant with extreme reduction in the individual flower of a hypothetical group of plants with carpels still open which preceded the Angiosperms proper.

In fairness, let us now turn to the latest discovered group of fossil plants, the Caytoniales, since Dr Hamshaw Thomas has in a measure made them a basis of a rival speculation as to the origin of the Angiosperms.\* His investigation of these fruit-bodies (barely the size of a currant) has been so painstaking and thorough that there can be little or no doubt as to his interpretation of their structure. We are also quite ready to accept his view that the fronds (*Sagenopteris*) and the microspore-bearing organs (*Antholithus*) found in the same matrix, though not in actual connection, represent respectively the foliage and microsporophylls of the Caytoniales. The fruit-bodies are distinctly angiospermous in the descriptive sense, since the seeds are enclosed in a cavity formed out of the sporophyll, and a stigma, a receptive spot for the pollen (microspores), appears to be present. The question naturally arises can these fruit-bodies be considered angiospermous in the phylogenetic sense? The sporophyll bearing these bodies was a pinnate or bipinnate non-foliaceous frond. There is no indication that these fronds were massed together into cones; the suggestion is rather that they were loosely arranged on the stem after the pteridospermous fashion. The "ovary" appears to have been formed by the turning in of the tip of the pinna (or pinnule). The ovules or seeds were borne on or near the midrib and not marginally. This form of angiospermy (seed-enclosure) is very different from that of the Flowering Plant as generally accepted. In the latter the whole carpellary leaf is involved in the enclosure and the ovules are moreover marginally borne. Dr Thomas has endeavoured to square matters with the true Angiosperm by imagining reduction to a single fruit body per sporophyll, and by bringing in Miss Saunders's theory of carpel polymorphism (not yet generally accepted) to explain the centrally borne seeds.

The microsporophyll attributed to the Caytoniales is also considered to have structural features in common with the androecium of the Flowering Plants. It would appear to be a much branched non-foliaceous frond, bearing at the tip of its ultimate ramifications a tuft of 3-6 sessile microspore-bearing bodies. Each of these is four-winged. Dr Thomas likens such a spore-case to the Angiospermous anther with its four pollen sacs. By reducing a sporophyll like the above to a single spore-producing body a passable resemblance to a stamen might be obtained, but the connective apparently would be missing!

The presence in these spore-cases of winged pollen grains is a significant discovery, indicating that the Caytoniales were markedly anemophilous. If this group has been ancestral to modern Angiosperms, what, may we ask, has become of the winged pollen grains? This very effective mechanism for anemophily is unknown among Angiosperms, though common in Conifers. Such a device might have been expected to have persisted in, for example, the supposedly primitive wind-pollinated Amentiferae!

If the Caytoniales bear resemblance of phylogenetic import to any other class of plants, then the Pteridosperms might be suggested. May

\**Linnean Society Proceedings*, 138th Session, p. 22, 1926.

they not be Mesozoic representatives of this great Palaeozoic group, which have evolved a form of angiospermy, independent in origin of that which gave rise to the true Flowering Plants? This discovery of seeds enveloped in a carpellary structure in plants, which otherwise have hardly a feature in common with modern Angiosperms, suggest that the flower as a whole rather than the enclósure of the ovules is the distinctive feature of the highest phylum of the vegetable kingdom, which would, in consequence, be better termed the *Anthophyta* than the *Angiospermae*.

A rational scheme of floral evolution can be based on the view that the order (cohort) Ranales contains the families with the least modified flowers. In a general way from the type of flower exemplified by *Magnolia* all other forms are considered capable of being derived by reduction and modification. In short, a primitive flower is held to be hermaphrodite with its members indefinite in number free from one another, borne spirally on a long axis and with no clear differentiation of its perianth into calyx and corolla. A derivation such as this for all Angiospermous flowers has been spoken of as the Ranalian hypothesis.

One of the main, if not the most important, trend in floral evolution from the cone-like flower found in the Magnoliaceae, and to some extent in the Ranunculaceae, is the shortening and spreading out of the floral axis (receptacle), leading eventually to its "invagination,"\* and the establishment of the perigynous and epigynous states. Perhaps—this is quite speculative—the original alighting place for visiting insects was the apical carpellary cone. With the flattening of the receptacle and the increased prominence and differentiation of the petals this has largely been transferred to the corolla. The compression of the floral axis tends to bring the anthers and stigmas into one plane and so facilitates pollination. It also entails reduction in the number of floral members and their disposition in whorls in place of the earlier spiral arrangement. Cohesion of floral members, especially noteworthy in the corolla and gynoeceum, as well as the development of the zygomorphic flower are generally recognised as advanced stages. The evolution of the unisexual from the hermaphrodite flower, usually accompanied by the suppression of the petals and the substitution of anemophily for entomophily, has already been dealt with.

Taken in its general aspects such a view of floral evolution as the foregoing appears reasonable, and is eminently teachable. This cannot be said for that based on Engler's system. It hardly seems possible to derive the Ranalian flower from any kind of floral structure to be found among the catkin-trees and other Apetalae; but the reverse is quite feasible.

In pressing the reduction view respecting the evolution of the flower, it must not necessarily be assumed that here and there an increase in

\*Epigyny—or at least some forms of it—may have arisen through the adhesion of the bases of floral members to the gynoeceum, rather than through the actual invagination of the receptacle.

floral members may not have taken place. It is well, however, to remember that systematic botany was, and still is to some extent, dominated by the idea of the five-whorled pentamerous flower constituting the ground plan of the Dicotyledon, and the principles of doubling, splitting and branching may have been too freely called upon to account for whorls and also members in whorls greater than five. The Ranalian families to the older systematists were somewhat of a stumbling block, as their flowers were difficult to harmonise with the formal flower of five alternating pentamerous whorls. To those who embrace the Ranalian theory these families instead of mystifying, supply the key to the whole. Indefiniteness in all parts of the flower is what we are on the watch for and requires no explaining away.

Some reference must here be made to Dr Salisbury's recent papers on floral construction in the Ranales and Helobiales (*Alismaceae*, etc.).\* His conclusions are at variance with the above, in that he considers a five-whorled trimerous flower or something tantamount to this to be the primitive condition for these groups, and all departures in the way of increase, even when the arrangement is spiral, to be derivative. He even suggests that such a flower as that of *Magnolia* may have originally come from one with its members arranged in definite whorls! To my way of thinking this is putting the cart before the horse with a vengeance! He bases his views on counts, and finds when the floral members are many they tend to be in multiples of three. May not the opposite inference be drawn from this? Respecting foliage leaves surely few would attempt to argue that the whorled arrangement taken on the whole has preceded the spiral. That in flowers three-membered whorls were differentiated earlier than five-whorled ones from the spiral arrangement appears probable on comparative evidence; and it may be that the Monocotyledons, which in the main are trimerous, separated off from the Dicotyledons before these had fixed a pentamerous type of flower.

Though Engler's classification has largely superseded De Candolle's on the Continent, it made tardy progress in this country, doubtless owing to the influence of Bentham and Hooker's system. Kew remained faithful to these systematists. When Sir Joseph Hooker was approached in 1907 on the subject, he replied to the effect that Engler's classification was no better phylogenetically than De Candolle's, and as regards convenience, not so good. Though Kew declined to arrange its herbarium or issue floras on Englerian lines, the German system gradually permeated and in certain quarters began to be followed with the sort of feeling of being up to date, when the phrase, out of date, might have been more appropriate! In the matter of systematic works devoted to the British flora, conservatism has mainly ruled, and we think rightly. There is one notable exception, viz., the incomplete sumptuous Cambridge British Flora, which is arranged on Engler's system. The Secretary of this Society in one of his recent annual reports uttered a lament to the effect that he supposed we would all have ultimately to adopt Engler's classifi-

\**Ann. Bot.* xxxiii., p. 47, 1919; xxxiv., p. 107, 1920; and xl., p. 419, 1926.

caution. I endeavoured to assure him otherwise, and this article is largely the outcome of the little correspondence we had over the matter.

It seems probable that the Monocotyledons were a very early offshoot from a primitive Dicotyledonous stock. Their peculiar structural features are better explained thus than on the opposite assumption, consequently the placing of the Monocotyledons before the Dicotyledons we consider a primary defect in Engler's classification.

A noteworthy treatise on the Monocotyledons has recently appeared from the pen of Dr Agnes Arber,\* the leading British authority on their morphology. This volume is the outcome of much original research on the morphology and anatomy of the root, stem, and leaf, and is particularly well illustrated by explanatory figures. The flower is only briefly touched upon. Besides the valuable descriptive part, there are thoughtful chapters—almost philosophical in their outlook—on the principles of morphology, on parallelism, and on biological evolution generally. The phylogenetical tree is reduced, as it were, to a bundle of sticks, specific and even generic characters are held to be non-adaptive, the Lamarekian and Darwinian positions rejected and refuge taken in the view that plant evolution has been pre-ordained! This is not the place to attempt any discussion of these somewhat sweeping conclusions, to which I feel many botanists will not be able to subscribe or only in a very modified way.

The author has a clever word to say on the single-cotyledon-puzzle. The fusion hypothesis, so ably put forward by the late Miss Ethel Sargent, is naturally discarded. The twin vascular bundle in the seed-leaf of the Monocotyledon upon which the theory was based has since been shown to be of common occurrence in the Dicotyledons. Dr Arber dismisses the puzzle of the missing cotyledon by asking why it should ever have been there, and suggests that "the growth rhythm happens to be of the type which produces a single leaf at the first node,"† instead of two. This is not altogether convincing, though I agree with her in regarding the cotyledons as the first leaves, and not organs *sui generis*. In this connection the few Dicotyledons known having single seed-leaves deserve consideration. Has not Dr A. W. Hill†† shown that the single cotyledon of *Cyclamen* arose through the abortion of the other one? If Dr Arber be correct in her supposition, monocotily and dicotily might have been expected to have turned up among Angiosperms in a haphazard fashion, like the occurrence of scattered and whorled foliage leaves. As it is dicotily appears ancient and fixed, and any departure therefrom looks as if due to suppression.

The closed vascular bundle, the lack of secondary thickening after the dicotyledonous plan, the early disappearance of the primary root and the character of the leaf suggest that some special environment called the Monocotyledons into being. Something is to be said for Hens-

\*Monocotyledons—A Morphological Study—Cambridge, 1925.

†*loc. cit.*, p. 179.

††*Ann. Bot.* xxxiv., p. 417, 1920.

low's aquatic idea, and similarly for Miss Sargent's geophilous theory. May not a glimmer of truth lie between these two views? The argument advanced against the aquatic origin to the effect that the older the group the greater the likelihood of finding aquatic forms in it need not necessarily apply to Monocotyledons, though it may hold for Dicotyledons. The forerunners of the former may have taken to the water so long ago, as to give time for a fresh evolution of land forms, even to the production of trees. The great difference in structure between a palm stem and that of a dicotyledonous tree is in harmony with such a speculation. The return to an ancient habit entails a new device. Structurally evolution does not work backwards.

Even a stronger case can be submitted for the primitiveness of the hermaphrodite flower with perianth in Monocotyledons than in Dicotyledons. Engler concedes such a flower as the original for the Aroid family, but regards the flower of the somewhat isolated genus, *Typha*, as primitively unisexual and naked; yet he holds the Screw Pines as unisexual through abortion, being forced apparently to this conclusion through the occurrence of a rudimentary gynoeceium in the male flower of *Freycinetia*, a genus of the Pandanaceae. In spite of this he places *Typha* in the same order (cohort) as this family. Are we to imagine that the unisexual *Typha* type gave rise to hermaphrodite forms now extinct, from which evolved the Pandanaceae with unisexual flowers due to reduction?

Assuming the origin of the Monocotyledons from the Dicotyledons, the question may be asked, are they to be regarded as mono—or polyphyletic—respecting their derivation from the latter? Though no satisfying answer can be given to this query, the writer sees no cogent reason at present for viewing the group as other than monophyletic. The Monocotyledons agree among themselves in so many features as to suggest a common origin. True, botanists have so far failed to trace satisfactorily all Monocotyledonous families to one original source, but this does not rule out the monophyletic standpoint. The earliest forms may quite easily have become extinct. We possess the main branches but not the trunk. A phyletic connection is distinctly suggested between the Helobieae (Alismaceae, Butomaceae, &c.) and the herbaceous Ranales, such as the Nymphaeaceae; but any linkage between the Helobieae and the Palms, for instance, is by no means obvious.

Dr Rendle's *Classification of Flowering Plants* of the Cambridge Biological series may be considered at present the standard text-book on the Angiospermae from the descriptive and systematic sides. It is arranged on Englerian lines with slight modifications, and begins therefore with the Monocotyledons. The volume devoted to them was published early in the century. The companion volume on the Dicotyledons made its belated appearance at the end of 1925, and as far as information respecting the individual families, the illustrations and get-up generally is concerned leaves little to be desired

and fills a gap in English botanical literature suitable for the advanced student. But we are bold enough to think that it may be the last of its kind arranged on the German system. It is interesting, therefore, to see what the author has to say in vol. ii. on classification from the phylogenetic side.

In the short introduction he writes (p. 2):—"The following arrangement does not claim to be strictly phylogenetic. Various attempts have been made to construct a phylogenetic system of Angiosperms, but the results are not convincing, bear no suggestion of permanence, and bristle with difficulties for the student." Such remarks, especially the bristling, are eminently applicable to the system he adopts! The following quotations bear on the supposed primitive character of the amentiferous or apetalous type of flower. "It seems likely that development of the highly differentiated insect-pollinated dichlamydeous flower was preceded by numerous, so to speak, experimental stages arising from earlier, now long extinct, Angiosperms, and it is a tenable view that such stages are represented among the Monochlamydeae" (p. 3). In referring to the three grades, as he terms them, evidently the apetalous, polypetalous, and sympetalous, he writes:—"The first grade includes orders with, on the whole, a comparatively simple type of flower . . . and while it is possible that some may be reduced forms . . . it is, on the other hand, possible to regard the members of this grade as representing lines of development from earlier extinct groups" (p. 3). In a recent review in the *Journal of Botany*,\* he writes:—"It is a tenable view that some of the apetalous orders may be survivals of far earlier types than the Ranalian, and it is not a necessary corollary that the Ranalian type has been derived from the Apetalae." Again in his text-book (vol. ii., p. 40) referring to the catkin-families as a whole, he says:—"The frequent presence of a pistil-rudiment in the male flower suggests a derivation from a type with bisexual flowers, probably with a simple inconspicuous bracteole-like perianth." Do we not discern in the above quotations a movement, vacillating though it be, towards the "right" on Dr Rendle's part? The probability of the derivation of the unisexual catkin flower from a hermaphrodite one is admitted. Why then, we may ask, should not families with bisexual flowers precede those with unisexual ones in classification, and would it not, therefore, be better to speak of the apetalous unisexual flower as a simplified rather than a single type of flower? Granted that there may have been experimental stages in the production of the highly differentiated flower with calyx and corolla, is it not more likely on the whole that relics of these stages should be found in the Ranalian families with their bisexual flowers, free and superior carpels, general indefiniteness in the number of floral numbers, and often feebly differentiated perianth; than in the Apetalae, and especially the Amentiferae, with their unisexual flowers, coherent often inferior carpels, and a general definiteness in floral parts. It is refreshing to have from a supporter of Engler a confession tantamount to the inability of

\*Vol. 64, p. 81, 1926.

deriving the Ranalian type of flower from the Amentiferous. We on the other hand see no difficulty in visualising the reverse derivation.

A phylogenetic scheme on Ranalian lines has been worked out with much skill and originality for the Dicotyledons by Mr J. Hutchinson of the Kew Herbarium in his recently published book, *The Families of Flowering Plants*, vol. i., Dicotyledons, already mentioned. A companion volume on the Monocotyledons is to follow in due course. The new system proposed which is now being used at Kew, for the official regional Floras of Tropical Africa, is much less of a break with the past than that of Engler, as the Ranalian families still occupy their time-honoured place at the beginning of the Angiosperms. Hutchinson's orders and families are of somewhat less dimensions than those of Engler and previous systematists, the idea being to make them more natural and less unwieldy. For instance, he divides the old Ranales into the Magnoliales (arborescent) and the Ranales (now used in the strict sense—herbaceous). The old family, Magnoliaceae, is limited to the genera, *Magnolia* and its close allies, and *Liriodendron* (Tulip Tree), making a very natural assemblage. The other genera previously included form the separate families, Winteraceae (*Drimys*, &c.) and Schizandraceae. He raises to full family rank the Caesalpinieae, Mimoseae, and the Papilionaceae; and thereby the Leguminosae reaches the status of order. The old heterogeneous family, Saxifragaceae, meets with needful drastic treatment. Such genera as *Ribes*, *Hydrangea*, and *Escallonia* form the nuclei respectively of separate families. Hutchinson fails to find existing any direct link between the Magnoliales and the Ranales as now used. These two orders form as it were a double base to the Dicotyledons, and from them he derives the higher Dicotyledons in two branches, one mainly arborescent and the other herbaceous. Each gives its quota to the Apetalae and each culminates in sympetalous forms. The point of dispute, the position of the Amentiferae, is met by supposing their derivation from the Hamamelidaceae. This is not really novel. Hallier put it forward some years ago and research since has suggested affinity between the catkin trees and the Rosales in the wide sense. The passage from the Magnolian type of flower to that of catkin may in quite a general way be represented as via the Trochodendraceae and the Hamamelidaceae. These families need closer scrutiny than they have yet received. Monotypic and isolated genera occur here, e.g., *Eucommia*. We should feel thankful to Hutchinson for this stimulating work. It has raised us out of a groove. Those who have never been enamoured of the Engler system should welcome it, and the best way of welcoming it is by sympathetic criticism.

And now for the application of my sermon. How does all the foregoing affect the classification to be adopted in our local floras? As these have in the past been mainly based on Bentham and Hooker, the change to be made is not revolutionary. There need be few startling alterations in the arrangement of the Polypetalae and Sympetalae. The British

Dicotyledons will continue to begin with the Ranunculaceae, and the Sympetalae will end with the Labiatae as in the past.

Let us deal with the sequence of the largest groupings first. The Monocotyledons, as in Bentham and Hooker's system, will still follow the Dicotyledons, but the Conifers (*Pinus*, *Juniperus* and *Taxus*) must no longer be sandwiched between the two. Such a position is quite out of date. Apart, perhaps, from the Gnetales, not represented in Great Britain, the Gymnosperms (Cycads and Conifers) have little in common with the Angiosperms, being of a lower grade of organisation. They should, therefore, precede the Flowering Plants as a whole and the Vascular Cryptogams or Pteridophyta (Ferns, Club Mosses and Horsetails), likewise the Gymnosperms. Though illogical, viewed phylogenetically the few conifers and vascular cryptogams may for convenience be relegated to the end of a manual as an appendix considering the subordinate part they play in our flora. Dr Burt Davy in his *Flora of the Transvaal*, part I of which has quite recently been published, is arranged according to Hutchinson's new scheme, and conforms to the phylogenetic sequence, commencing with the Pteridophyta, followed by the Gymnosperms and then the Dicotyledons.

The manner of treatment of the Apetalae in Hutchinson's new arrangement naturally marks the widest departure from the old Bentham and Hooker system. Engler, and we think rightly, united this group with the Polypetalae and designated the whole, the Archichlamydeae, contrasting it with the Sympetalae, which to harmonise he called the Metachlamydeae. These terms, though clumsy and cacophonous, are by derivation apt and have been adopted by Hutchinson. Engler, as already pointed out, commences the Dicotyledons with apetalous instead of Ranalian families. Rendle, though following Engler's sequence, restores the Apetalae (using the alternative, Monochlamydeae) and employs the term, Dialypetalae, for the Polypetalae. We are doubtful of the advantage of either of these changes. His Monochlamydeae has perforce now to include such marked petalous forms as the Caryophyllaceae, and on the other hand such typically apetalous families as the Buxaceae and Euphorbiaceae have to appear in his petalous group. Dialypetalae is a much less familiar term than Polypetalae.

The Apetalae from our standpoint being derivable from the Polypetalae and none from the Sympetalae, should be more closely associated with the former group. Hutchinson distributes the apetalous families among the polypetalous according to the affinities indicated by their floral structure. The striking case is the linking-up of Bentham and Hooker's Caryophyllinae with their Curvembryae. This, of course, was done by Engler, but he in his composite cohort, Centrospermae, begins with the families having a simple perianth, and ends with the Caryophylls. Hutchinson naturally follows the opposite sequence, indicating thereby that the petals have been lost in the Chenopods and the like. It is interesting to find from a footnote in the *Genera Plantarum* that Bentham and Hooker were quite aware that affinity was violated by keeping the Caryophylls and the Chenopods apart. The Polygonaceae

are also to be drawn into the same wide circle of relationship. Except for the foregoing most of the old apetalous families would, in a British Flora, assemble themselves towards the end of the Polypetalae. This is a more rational position than at the end of the Sympetalae.

The arrangement of the Monocotyledons in Bentham and Hooker's system now leaves much to be desired, and that of Engler is a considerable improvement as regards the way the families are allotted to cohorts. He commences with the Typhaceae. We should prefer beginning with the Helobieae, thus harmonising with the position the Ranales occupy in the Dicotyledonous sequence. Further discussion had better be left until we have seen how Hutchinson proposes to deal with the Monocotyledons, save to say that we think the Orchidaceae and the Gramineae should be placed at the head of the petalous and apetalous families respectively

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#### NEW FORMS OF *THYMUS* FROM THE BRITISH ISLANDS.

By KARL RONNIGER, Vienna.

Translated by Dr S. H. VINES, F.R.S.

The kind intervention of Mr A. J. Wilmott has made it possible for me to go through the rich *Thymus* material of the British Museum. I reserve for a subsequent occasion the account of their distribution and the discussion of the extent of their variation. But as Dr G. C. Druce desires to have a short contribution on the subject for this *Report*, I now propose to describe two forms new to England, which I found in the British Museum material, of which one is, moreover, new to science.

1. *THYMUS CARNIOLICUS* Borbas, apud Déségl. in Bull. Soc. Sci. Angers, 1882, p. 191 (nomen): Oesterr. Bot. Zeitschrift 1889, p. 275 (descript.); Borbás, Symbolae ad Thymos eur. med. praec. hung. cogn. 1890, p. 104.

This plant belongs on the whole to *T. Froelichianus* Opiz, *Nomenclat. Bot.* (1831), p. 80: compare Ronniger in Fedde, *Repertorium* xx. (1924), p. 661, and *Allg. Bot. Zeitschrift* xxvi.-vii. (1925), p. 19. It may also be called *T. Froelichianus*, ssp. *carniolicus*.

Plant 8-10 cm. high (even taller on the continent), of pseudo-repent habit, having creeping runners, short. Stem thin,  $\frac{1}{2}$ - $\frac{3}{4}$  mm. in thickness, decumbent at base. The sharply quadrangular stem bears two rows (goniotrichous) of closely set longer and shorter hairs: the longer hairs exceed the diameter of the stem. Leaves thin, broadly lanceolate or elliptical, rounded towards the apex, rapidly narrowing at the base, densely hairy on the upper surface, with long marginal cilia (1.5 mm.), under surface glabrous or with scattered hairs; the nervature does not project on the under surface; 6-8 mm. long, 3-4 mm. broad. Capitula

usually elongate, interrupted, rarely short and globular. Peduncle bears close, short retrose hairs. Calyx 3 mm. long, densely covered with villous hairs, except on the dorsal surface which is nearly glabrous.

In its habit the plant resembles *T. glaber* Mill., more particularly the broad-leaved forms of that species: but it differs from them in the villous hairiness of all its parts. It is, in fact, closely related to *T. glaber*.

As regards *T. glaber* Mill. itself, it will become necessary to distinguish its broad-leaved forms (leaf more ovate,  $\pm$  twice as long as broad) as f. *Chamaedrys* (Fries), from the narrow-leaved forms (leaf more lanceolate,  $\pm$  three times as long as broad) = f. *glaber* (Mill.).

*T. carniolicus* Borbás is a decidedly Atlantic, West European species, which is not rare in France and Spain: in Germany it inhabits only the extreme west (Grand Duchy of Baden, upper valley of the Danube). North of the Alps it extends as far as the Vorarlberg; south of the Alps it is distributed in a narrow zone as far as Carniola and Fiume: it has also an outlying locality in the Lungau (Salzburg, upper valley of the Mar).

Localities in England:—Wigtonshire, Barnbarroch (leg. E. K. Higgins); Cambridgeshire, Gogmagogs (Hunnybun: leg. E. S. Marshall); Sussex, Telscombe (leg. T. Hilton).

## 2. THYMUS PSEUDO-LANUGINOSUS Ronniger ined.

Allied to *T. Serpyllum* L., more particularly to the race *T. britannicus* Ronn., from which it differs in the dense greyish villosity of all its parts. Its main stem is long and creeping, terminating in a sterile prostrate shoot and bearing sterile prostrate lateral shoots: but isolated floriferous shoots are not infrequent in all races of *T. Serpyllum*. The flowering branches are low, about 4-7 cm. high, springing in rows from the stolons of the previous years; glabrous on two sides, bearing on the two alternate sides dense outstanding hairs. Leaves small, rather thick, rigid, 7-nerved (nerves projecting on the under surface), more or less narrowly elliptical, rounded at the apex, cuneate at the base, 4-6 mm. long,  $1\frac{1}{2}$ -3 mm. broad, densely grey-villous, the lower side less densely hairy. Inflorescence spherical, rarely somewhat elongated, at most  $1\frac{1}{2}$  cm. in diameter (in bisexual specimens). Calyx villous all over (the dorsal hairs short),  $3\frac{1}{2}$ -4 mm. long, upper calyx-teeth short, about as broad as long.

Localities:—Dorsetshire, cliffs between Swanage and Dancing Ledge (leg. C. E. Salmon), and Durlstone (leg. E. F. Linton).

## NOTE ON NOMENCLATURE.

By G. CLARIDGE DRUCE, D.Sc., LL.D.

(Sent to the Botanical Congress at Ithaca, 1926.)

While there is much in the Vienna Actes with which all botanists agree there are some of its clauses which are arbitrary and not in the interest of botanical science.

Therefore I strongly support the Revocation of Art. 36, which makes the validity of publication of a group or species contingent on its being accompanied by a Latin diagnosis. This has well nigh passed into desuetude. There is only one thing worse than having no rule at all—that of having a rule which no one follows. It may be found desirable to limit the diagnosis to the English, French, Italian, Spanish and German languages.

It has been suggested that names which are to be rejected are those “which are apt to excite ridicule.” Who is to decide what is ridiculous? What would excite risibility in one individual leaves another cold. See Art. 50. *Barbarea Barbarea* appears to have raised the risibility of some of Engler’s students, but such a duplicated name to the zoologists (See Art. 6, “The principles and forms of nomenclature should be as similar as possible in Botany and Zoology.) would not cause a smile. Yet the Actes, while rejecting duplicated names allow *Sagina Saginoides* and *Sesbania Seshan*. These are perilously near a duplication, yet have the advantage of conveying something of the history of the species.

The rejection of misleading geographical names has been recommended. This may lead to considerable alterations and seems undesirable. (See Art. 57.) Most people know that *Scilla peruviana* L. does not come from Peru, and there is no need to use the later name of *Scilla hemispherica* Boissier. If the method were adopted, why should it be limited to geographical errors? Indeed Rouy (*Fl. Fr.* xiii.-xiv., 216) forestalls this question and renames, or rather discards, *Bromus sterilis* L. because it is not sterile, and *Papaver hybridum* L. and *Roemeria hybrida* DC. because they are not hybrids, and so on. Anderson alters Hall’s *Rubus nessensis* to *R. suberectus* And. (a name still wrongly used by some botanists) because the plant was not confined to Loch Ness-side—but he had not sufficient temerity to attempt to change *Cornus suecica* L. because that plant grew elsewhere than in Sweden.

It is, however, Article 20 that has aroused the greatest amount of opposition. It provides “a list of names which must be retained in all cases,” the excuse being “to avoid disadvantageous changes in the nomenclature of genera by the strict application of the principle of priority in starting from 1753.” This is not in accord with Art. 3, which runs, “The rules of nomenclature should neither be arbitrary nor imposed by authority. They must be simple and founded on considerations, clear and forcible enough for everyone to comprehend, and be disposed to accept,” and with Art. 19, “Botanical nomenclature begins

with the *Species Plantarum* of Linnaeus, ed. i., 1753, for all groups of vascular plants.''

Art. 20 was not carried without opposition, and voters on the question were not necessarily taxonomists or experts on the subject of nomenclature. The List of Conserved Names was not drawn up with necessary care, many of the names being already dealt with under other rules. It was eminently unfair in its selection and contains gross anomalies. Nor was the avowed object greatly aided since many of the conserved generic names include few species. Many important authorities ignore them, in others only a grudging and qualified assent is given. The disadvantage of such a course is evident. I heartily endorse what was written in the *Bulletin of the Torrey Botanical Club* for April 1907, "that they regard [exclusion of several hundred generic names from the operation of all nomenclatorial rules] as in the highest degree arbitrary, as controverting a cardinal principle." Therefore, in my *List of British Plants*, published in 1908, the Nomina Conservanda were, with one exception, deliberately ignored. The years that have elapsed since have not shaken my attitude, and not until a well-selected committee of competent authorities has dealt with the subject and submitted to a meeting for acceptance a small list, the fewer the better, of conserved names will one's objections be overruled.

As showing how ill-selected and in what an arbitrary manner the List of Nomina Conservanda was framed, a few examples are given here.

NOMINA CONSERVANDA, VIENNA 1905. NOMINA CORRIGENDA 1926.

6994. CALYSTEGIA R. Br. Prod. 483, 1810 = VOLVULUS Medik. in Phys. i., 202, 1791. Species 7.

Medikus established it with the species *V. sepium*. It is used by Kuntze in *Rev. Gen. Pl.* and *List of Brit. Pl.*

2986. CAPSELLA Medik. Pflanz. i., 85, 1792 = BURSA (Weber) in Wigg. Prim. Fl. Holsat. 47, 1780. Species 4.

Also brought into citation by Boehmer in *Ludv.*, 1760.

The name *Bursa* is very ancient, being used by Dorstenius in the *Botanicon* of 1540, by Turner in his *Names of Herbes* of 1548, etc. *Capsella* is a faulty modern name. *Bursa* is a properly defined genus with a species added. It is used by Groves in Babington's *Manual* of 1904, in the *American Check List* and *List of Brit. Pl.*

2858. CORYDALIS Ventenat in Choix 1802 = CAPNOIDES (Tourn.) Miller Abr. 1754 et Adans. Fam. ii., 431, 1763. Species 90.

*Capnoides* is used by Moench (*Methodus* 152, 1794), who described four species under it, by Kuntze (as *Capnodes*) in *Rev. Gen.*, by Groves (*l.c.*) and in the *American Check List* and *List of Brit. Pl.*

There are other earlier names than *Corydalis*.

269. CORYNEPHORUS Beauv. Agr. 90, 1812 = WEINGAERTNERIA Bernh. Syst. 23, 1800. Species 2.

Beauvois' name is clearly antedated. *Weingaertneria* was used (misspelled) by Bentham in *Journ. Linn. Soc.* 1881, by Groves (*l.c.*), and in Rendle & Br. *Brit. Seed-Plants* 1907, and in the American and British Lists.

282. CYNODON Rich. in Pers. Syn. 85, 1805 = CAPRIOLA Adans. Fam. ii., 31, 1763. Species 4.

*Dactylon* Vill. and *Fibichia* Koehl also are earlier names than *Cynodon*. *Capriola Dactylon* was named by Kuntze in American and British Plant Lists, by Groves (*l.c.*).

6195. DABEOCIA D. Don in Ed. Phil. Journ. 160, 1834 = BORETTA Neck. Elem. ii., 212, 1790. Species 1.

*Boretta* is used by Kuntze (*l.c.*), Groves (*l.c.*), Rendle & Brit. (*l.c.*), *List of Brit. Pl.*, etc.

2856. DICENTRA Bernh. in Linnaea 8, 457, 1833 = CAPNORCHIS (Lud.) Miller Abr. 1754. Species 15.

Borck. in *Roem. Arch.* i., ii., 46, 1797, named *C. spectabilis*, and Planchon in 1853-4 named under it four species. There are other earlier names than *Dicentra*, which is clearly antedated by *Capnorchis*.

2528. ERANTHIS Salisb. in Tr. Linn. Soc. 8, 303, 1807 = CAMMARUM Hill Brit. Herb. 47, 1756. Species 7.

This was well defined and figured by Hill; it is used by Greene, Groves (*l.c.*), and *List of Brit. Pl.*, etc.

*C. hyemale* Greene is the type. *Helleboroides* Adanson of 1763 is also earlier than *Eranthis*.

6018. FALCARIA (Riv.) Host Fl. Austr. i., 381, 1807 = PRIONITIS Adans. Fam. ii., 499, 1763. Species 4.

*Prionitis* is used by Dumortier *Fl. Belg.* with species in 1823.

276. HIEROCHLOE (Gmel.) R. Br. Prod. 218, 1810 = SAVASTANA Schrank Baier Fl. i., 100, 1789. Species 13.

Established by Schrank with one species. Used in *American Check List*, *List of Brit. Pl.*, etc.

*Torresia* Ruiz & Pavon 1794 is also earlier than R. Brown.

1893. HYMENOCARPUS Savi Fl. Pis. ii., 205, 1798 = CIRCINNUS Medik. Species 1.

Established by Medicus *Vorles* ii., 384, 1787, with a species, and used by Kuntze in *Rev. Gen. Pl.* and *List of Brit. Pl.*

374. LAMARCKIA Moench Meth. 201, 1794 = ACHYRODES Boehm. in Ludw. Def. Pl. 420, 1760. Species 1.

*Achyrodes* was revived by Kuntze (*l.c.*).

94. *LEERSIA* Swartz Prod. 21, 1788 = *HOMALOCENCHRUS* Mieg. in Act. Helv. iv., 307, 1760, et Scop. Intr. 73, 1777. Species 5.  
Pollich, *Hist. Pl. Pal.* in 1777, put a species to it. It is adopted in the *American Check List*, Groves (*l.c.*) *List of Brit. Pl.*, etc.
937. *LUZULA* DC. in L. & DC. Fl. Fr. iii., 158, 1805 = *JUNCOIDES* Adans. Fam. ii., 47, 1763. Species 40.  
*Juncoides* was revived by Kuntze (*l.c.*). Used in *American Check List*, *List of Brit. Pl.*, Groves (*l.c.*), etc. Smith (because *Luzula* was a faulty name) founded *Iunciola*.
119. *MAIANTHEMUM* Web. in Wigg. Prim. Fl. Holsat. 14, 1780 = *UNI-FOLIUM* (Moehr.) Adans. Fam. ii., 54, 1763. Species 2.  
*Unifolium* is used with a species by Allioni *Fl. Pedem.* 1785, in *American Check List*, *List of Brit. Pl.*, etc.  
We see that *Bursa* founded by Weber is rejected for the later *Cap-sella*. Here another, but a much antedated genus of the same author in the same publication, is retained.
3032. *MALCOMIA* Br. Ait. Hort. Kew. iv., 121, 1812 = *WILCKIA* Scop. Intr. 317, 1777. Species 30.  
Established, with a species, by Scopoli and used by F. von Mueller and others.
7102. *MERTENSIA* Roth Cat. i., 24, 1797 = *PNEUMARIA* Hill Veg. Syst. vii., 50, 1764. Special 15.  
Clearly established by Hill in an important work with three described species. Used in Groves (*l.c.*), *American Check List*, *List of Brit. Pl.*, etc.  
The type is *Pneumaria maritima* Hill.
2965. *NASTURTIUM* Br. in Ait. Hort. Kew. iv., 109, 1812 = *RADICULA* (Dill.) Hill Brit. Herb. 265, 1756. Species 50.  
*Radicula* is used by Moench Meth. 262, 1794, with species by Groves (*l.c.*), *List of Brit. Pl.*, Rendle & Br. (*l.c.*).  
*Radicula* antedates *Rorippa* Scop. *Fl. Carn.* 520, 1760.
9464. *SILYBUM* (Vaill.) Adans. Fam. ii., 116, 1763 = *MARIANA* Hill Veg. Syst. iv., 19, 1762. Species 2.  
*Mariana* is clearly established by Hill in an important work with a described species. Used by Groves (*l.c.*), *List of Brit. Pl.*, etc.  
*Silybum Marianum* was not named until 1791 by Gaertner. Its retention is indefensible.
987. *SIMETHIS* Kunth Enum. Pl. iv., 618, 1843 = *PUBLARIA* Rafin. Fl. Tell. ii., 27, 1836. Species 1.  
The genus was clearly defined by Rafinesque seven years before *Simethis*. It is used by Groves (*l.c.*), *List of Brit. Pl.*, etc.  
The type is *P. planifolia*.

2261. *SUAEDA* Forsk. Fl. Ae.-Arab. 69, 1775 = *DONDIA* Adans. Fam. ii., 761, 1763. Species 40.

*Dondia* is used by Britton & Brown in *Flora of the North. U.S.*, by Small in *Bull. New York Gard.*, by Heller in *Cat. N.A. Pl.*, by Nelson in *Coult. Bot. Gaz.*, and Druce in *List of Brit. Pl.*, and others. It is older than *Lerchea*.

*Dondia maritima* Dr. is the type.

143. *TRAGUS* Haller St Helv. 203, 1768 = *NAZIA* Adans. Fam. ii., 31, 1763. Species 1.

*Tragus* Haller had no species, but Scopoli in 1777 described *T. racemosus*. *Nazia* was adopted by Kuntze (*l.c.*).

5998. *TRINIA* Hoffm. Gen. 92, 1814 = *APINELLA* Neck. Elem. i., 191, 1790. Species 12.

*Apinella glauca* is used in *Druce Fl. Berks*, by Kuntze in *Rev. Gen. Pl.*, by Caruel and Groves (*l.c.*).

8668. *WAHLENBERGIA* Schrad. Cat. Pl. Hort. Goett. 1814 = *CERVICINA* Delile Flore d'Egypte 150, 1813. Species 100.

This genus was well defined, with a figured species duly named in an important work. It has been used by Groves (*l.c.*), Britten in *Bot. Cook Voyage*, p. 56, Hiern *Cat. Afr. Pl.* i., 631, Druce *Fl. Berks* and *List of Brit. Pl.*

*Cervicina campanuloides* Delile is the type. The conserved name was published in an unimportant work without a species. In other publications Schrader included plants of different genera. There are two other genera bearing the name *Wahlenbergia*, neither of which are competing names. Its retention is unjustifiable. A. de Candolle, in his Monograph, unfortunately overlooked the claims of *Cervicina*.

These examples are selected chiefly from genera containing British species, and emphasise the lack of uniformity and the extraordinary and arbitrary methods of selection.

One is struck at the smallness of many genera in the list. 17 of these instanced here would necessitate the alteration of only 120 names, the whole of the cited genera would not involve more than 500. For this temporary inconvenience—few of the species are hortal—is it worth while to sacrifice a great principle, and to create a hostile feeling caused by its unfairness?

The erratic choice of conserved names is shown in that while *Silybum* is cited for Adanson, that author's *Nazia* and *Dondia*, equally well founded, are rejected; that Medikus, whose genus *Capsella* is wrongly conserved (as against the earlier *Bursa*) is erroneously rejected in the case of *Volvulus* and *Circinnus*.

Again Weber is wrongly chosen for *Maianthemum* but ignored for *Bursa*, both published in the same work.

It is probable that the framers of the Nomina Conservanda were unacquainted with Miller's *Gardeners' Dictionary* of 1754 and Hill's

*British Herbal* of 1756, but both are important works prepared by competent botanists, and are as available for citation under the Actes as are those of Adanson, Scopoli 1760, and others, whose names are used for genera.

I am prepared to move a Proposition that the foregoing genera, and others which are inserted in the List of Nomina Conservanda in defiance of the Rule of Priority, shall be deleted when there exist earlier, well-defined, and unexceptionable names that have been used or revived by botanists in important systematic works.

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A REVISION OF THE DETERMINATIONS OF THE GRASSES OF  
THE *FESTUCA OVINA-RUBRA* GROUP.

Distributed under the Botanical Exchange Club of the British Isles and  
Recorded in its *Reports* since the First Issue in 1867.

By W. O. HOWARTH, M.Sc., F.L.S.

In my investigation of the above group I have examined a number of collections, both public and private, in which Botanical Exchange Club specimens are represented. This especially applies to the Herbarium Britannicum in the hands of the Secretary, Dr G. Claridge Druce, and the collection of the late Mr Charles Bailey, now in the possession of the University of Manchester. I have been able to trace practically all the plants referred to in the *Reports*, and in so doing have had to correct the determinations of some. Members of the Club and others, who have these plants in their herbaria, will doubtless be glad of the opportunity of revising their labels, and it is with this object in view that this paper is presented. Those interested are referred to Hackel's *Monographia Festucarum europaeorum* (1882), and to my two papers in the *Journal of the Linnean Society*—"Botany," vol. xlv., p. 313, January 1924; and vol. xlvii., p. 29, February 1925. In each case I give the year for which the *Report* is published, followed by the page and sufficient of the label to ensure correct identification of the specimen, then the name according (a) to Hackel, and (b) to myself, where the plant is first mentioned.

- 1871, 21. "Sandhills, Wallasey, Cheshire," J. H. Lewis.  
*Festuca rubra, eu-rubra, genuina*, near sub-var. *arenaria*  
Hack., but not a typical specimen. Different panicles  
vary in the amount of pubescence on the spikelets.  
*F. rubra*, near var. *arenaria* mihi.
- 1879, 22. "Burntisland, Fife, June 1879," Dr J. Boswell.  
*F. rubra, eu-rubra, genuina*, sub-var. *glaucescens*.  
*F. rubra*, var. *glaucescens*.

- "Wallasey, Cheshire, July 1879," Lewis. I have not seen any of this gathering, but in 1875 Mr Lewis distributed plants similar to those of his 1871 gathering above.
- "Sea cliffs near Cawsand, E. Cornwall, 9th July 1878," Ley.  
*F. rubra, eu-rubra, genuina*, sub-var. *pruinosa*.  
*F. rubra*, var. *pruinosa* under *glaucescens*, but I now regard these as two distinct varieties.
- 1880, 38. "Close turf, Herefordshire Beacon, 20th May 1880," Ley.  
*F. ovina, eu-ovina, vulgaris*, sub-var. *genuina*.  
*F. ovina* L., but probably the glaucous-green form scarcely distinguishable from the more common type in dried material.
- 1881, 59. "Rough pasture, Treverannen, Hereford, 25th June 1881," Ley. As preceding.  
 "Hill Wootton, Warwick, June 1881," Baker.  
 "July 1881," Bromwich.  
*F. ovina, eu-ovina, duriuscula*, sub-var. *genuina*.  
*F. longifolia*, var. *genuina*.  
 There is some *F. ovina* L. in Mr Baker's gathering.
- 1884, 119. "Uig, Skye, 6th August 1884," Linton.  
*F. rubra, eu-rubra, genuina*, sub-var. *pruinosa*.  
 This is the type gathering upon which Hackel founded his sub-var. *pruinosa*. On other parts of the west coast it passes into sub-var. *glaucescens*, and is connected with this rather than with sub-var. *juncea*.
- 1885, 140. "Railway bank, Leek Wootton, Warw., June 1885," Bromwich. See under 1881, 59, Hill Wootton.  
 "Near Banbury, Oxon," G. C. Druce.  
*F. ovina, eu-ovina, duriuscula*, sub-var. *trachyphylla*.  
*F. longifolia*, var. *trachyphylla*.  
 I have not seen a specimen to verify this determination.
- 1886, 162. "Sandy Dunes, Caister by Yarmouth, Norfolk, 23rd August 1886," Linton.  
 The panicles on the sheets I have examined have hispid spikelets. This places such plants under *F. rubra, eu-rubra, genuina*, sub-var. *barbata*, and not sub-var. *grandiflora* as determined by Hackel.  
*F. rubra*, var. *dumetorum* mihi.
- 1887, 194. "Hedge Court, Surrey, 1887," Beeby, and "Leek Wootton, Warw., 1884," Bromwich.  
 If a true species the correct name is *F. capillata* Lam., and so in my paper. If a variety of *F. ovina*, as in Hackel, then the name is either *F. ovina*, var. *paludosa* Gaud. (1828) or var. *tenuifolia* (Sibth.) Dub. (*Bot. Gall.* i., 518, 1828).
- 1888, 239. "Sunninghill, Berks, July 1887," Druce. As preceding.  
 "Shady hedgebank, near Chislehurst, Kent, August 1888," Eyre de Crespigny.

- F. rubra, eu-rubra, genuina, vulgaris* since some of the plants have short stolons.
- F. rubra, vulgaris* mihi.
- "Stow Wood, Oxon, June 1887," Druce.
- F. rubra, eu-rubra, fallax*. If a true species the name is *F. fallax* Thuill., if a variety, *F. rubra, commutata* Gaud.
- 1890, 315. "Sandhills, Hartlepool, 11th July 1889," Fox.  
This is one of the forms intermediate between *F. rubra, eu-rubra, genuina*, sub-var. *arenaria* (*F. rubra, arenaria* Osb.), and *F. rubra*, sub-sp. *dumetorum* (*F. juncifolia* St Am.) but nearer to the latter, under which I should place it.
- 1892, 392. Hackel gave the correct names to all four.
- 1894, 462. "Rocks of the Avon, below Aveton Gifford, S. Devon, 20th June 1894," Marshall.  
Hackel names it *F. rubra*, sub-var. *glaucescens*, but I should rather place it under his sub-var. *pruinosa*, if the two are to be kept distinct. See under 1884.
463. "Coast, Bigbury Bay, S. Devon, 22nd June 1894," Marshall.  
Here again I think the plant ought to be named sub-var. *pruinosa*, the spikelets are quite glabrous.  
I agree with the names of the other two.
- 1896, 531. "St Bee's Head, Cumberland, 13th June 1896," Adair. As the preceding, but see also under 1900.
- 1896, 531. "Sands of St Aubyn's Bay, Jersey, 18th June 1896," Lester.  
*F. rubra, eu-rubra, genuina*, sub-var. *grandiflora* Hack.  
*F. rubra*, var. *grandiflora* mihi.
- 1897, 577. I have not been able to trace either of these sheets.
- 1900, 651. "St Bee's Head, Cumberland, 15th June 1900," Adair.  
This gathering included a range of pruinose forms, from those with smooth through hispidulous to pubescent spikelets. Probably Hackel had one of the last type, and gave the name as sub-var. *barbata*, but overlooked the pruinose character. The forms with smooth spikelets really belong to sub-var. *pruinosa*, those with hispidulous spikelets are true *glaucescens*. This gathering shows the close link between the two forms. Then the hispid character has become more pronounced still in some, giving the pubescence characteristic of sub-var. *barbata*. Altogether it is a very interesting set.
- 1903, 31-2. I agree with all the names given by Hackel. Note in the last-mentioned that *juncea* is a sub-variety in Hackel.
- 1904, 39. Correctly named by Hackel.
- 1905, 50. "Sandy shore, Skegness, 13th June 1905," Horwood.  
*F. rubra, eu-rubra, genuina, vulgaris* Hack.  
*F. rubra* L., not *F. ovina* L. as suggested by E.S.M.  
Same locality and date, under "*F. rubra* L., *arenaria* Osb."  
Some of the sheets examined approximate to *F. rubra*,

- genuina*, *grandiflora* in that their spikelets are quite glabrous. Others with decidedly pubescent spikelets are intermediate between *F. rubra*, *genuina*, *arenaria*, and *F. rubra*, sub-sp. *dumetorum*, but nearer to the former. Both types are present at Skegness, and intermediates abound probably through hybridisation. See 1911, p. 141.
- 1906, 251. "Heysham Harbour, 10th July 1906," Wilson and Wheldon.  
*F. rubra*, *genuina*, *vulgaris*.  
 "Sandhills, Weston-super-Mare, 22nd June 1906," Bickham.  
 There appear to be two types in this gathering:—*F. rubra*, *genuina*, *glaucescens*, and *arenaria*.
- 1907, 322. "Inchnadamph, July 1907," Druce.  
*F. ovina*, *capillata* Hack.  
 "Correifron, 9th August, and Midlaw Burn, 23rd July 1907," Johnstone and Linton.  
*F. rubra*, *genuina*, *barbata* Hack. *F. rubra*, *dumetorum* mihi.  
 "Ledbury, 8th July 1907," Bickham.  
*F. rubra*, *fallax* Hack.  
 "Near Moffat, Dumfries, 16th July 1907," Linton.  
*F. rubra*, *genuina*, *vulgaris*, approaching *fallax* in its root and *grandiflora* in its spikelet characters.  
 "*F. heterophylla*, Oxford, June 1907," Druce.  
 I agree, also with that from Berks.
- 1909, 482. "*F. heterophylla*, near Peebles, August 1909," Druce. Correct.
- 1910, 607. "Coleman Road, Leicester, 19th August 1910," Horwood.  
*F. rubra*, *genuina*, *vulgaris* Hack.
- 1911, 141. All correctly named.
- 1912, 297. I agree with Hackel's naming of all except that from "St Osyth, 13th June 1912," Brown. Hackel must have had a glabrous specimen. There is some true *arenaria* in the gathering, and the glabrous forms are no doubt *arenaria*, forma *glabra*, and not *grandiflora*.
- 1913, 513. All seen and named by Hackel.
- 1914, 174. "*F. dumetorum*, forma *planifolia* Hack., Skegness, Lincs, July 1911," Druce.  
 This is important as being the type gathering for this particular form of the plant which I regard as *Festuca juncifolia* St Am.
- 1915, 387. "Railway banks, Walton Junction, 9th June 1915," Wheldon.  
*F. rubra*, *genuina*, sub-var. *vulgaris* Hack.  
 "Marram grass belt, dunes near Hall Road, Lancs, 1st July 1915," Wheldon.  
*F. rubra*, *genuina*, sub-var. *grandiflora* Hack.  
 "Dry bank, Torquay, 23rd May, 1915," Robinson.  
*F. rubra*, *genuina*, sub-var. *vulgaris* Hack., not *fallax*.  
 "Sand dunes, Hightown, Lancs, 1st July 1915," Wheldon.

- F. rubra, genuina*, and approaching sub-var. *arenaria*. The gathering is mixed, the spikelets passing from glabrous to hairy in different panicles.  
 "Dunes, Ainsdale, Lancs, 4th July 1915," Wheldon.
- F. rubra, genuina*, and approaching sub-var. *juncea* Hack.  
 "Lutterworth, Leicester, 4th June 1909," Horwood.
- F. rubra, genuina*, sub-var. *vulgaris* Hack., not *fallax*.  
 "Milford-on-Sea, Hants, May 1915," Cosmo Melvill. Correctly named.
- 1917, 259. I have not seen any of the gatherings under the labels—  
*F. rubra* L., var. *fallax* Hack., Wade, or *F. rubra* L., var.,  
 Cosmo Melvill.
- 1918, 532. "Douglas, Isle of Man, June 1918," Holt, Bailey.  
*F. ovina, vulgaris*, sub-var. *hispidula* Hack.
- 1919, 847. "*F. ovina* L. (378), Arthog, Merioneth, 14th June 1915,"  
 Barton. I have not seen these two forms but suggest that they are normal *F. ovina*, and the sub-var. *hispidula* Hack. I have no records of *F. capillata* or of its var. *hirtula* from this district.  
 "*F. ovina* L., var. ? Inchnadamph, July 1919," Druce.  
 Is this the same plant as was distributed in 1907, p. 322?  
 "*F. tenuifolia* Sm. Milford-on-Sea, June 1919," Melvill.  
 See my remarks on this plant under 1887, p. 194.  
 "Coast sands, St Osyth, N. Essex, 29th May 1919," Brown.  
 See under 1912, p. 297, but I should place this gathering under *F. rubra, genuina, vulgaris*, with some of the plants showing a tendency towards sub-var. *glaucescens*.  
 "Sandhills between Aberdovey and Towyn, Merioneth, 25th May 1919," Melvill.
- F. rubra, genuina*, sub-var. *vulgaris* Hack.  
 "Sutton Heath, Northamptonshire, 15th June 1915," Horwood.  
 The specimens I have seen have glabrous spikelets and thus come under *F. rubra, genuina*, sub-var. *vulgaris* Hack.
- 1919, Pt. V., p. 690. "*F. rubra* L., var. *pruinosa* Hack., Newport, Pembroke," Druce.  
 The specimen I have examined I should place under *F. rubra, genuina*, sub-var. *vulgaris*.  
 "*F. ovina* L., var. *vivipara*. On Carnedd Llewellyn."  
 Not var., but forma; the true var. *vivipara* is under *F. supina*.
- 1923, 412. "Borth, Glam., 23rd June 1923," Cumming.  
*F. rubra, genuina*, sub-var. *arenaria* Hack.
- 1924 and onwards. I have given my opinion in the *Reports*.

## CORRECTIONS.

In the *Reports* for 1918, vol. v., pt. ii., p. 409; 1924, vol. vii., pt. iv., p. 746, and 1925 vol. vii., pt. vi., p. 1071, read the generic name

*Puccinellia* as the correct spelling in each case. I had made this alteration in my note of 1925, but unfortunately the printer introduced a rendering of his own, thus coining another misnomer. Those who have sheets will realise that the 1925 label repeated the mistake of that of 1924, where I raised the question of the correct spelling. This I attempted to supply in my 1925 note, with unfortunate consequences.

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### ON POA SUBCAERULEA SM. AND ITS RESTORATION.

By C. A. M. LINDMAN, Stockholm.

When J. E. Smith discovered this plant, "The Blueish Meadowgrass," he published it in his *English Botany*, vol. 14, t. 1004 (1802). Although this picture is not one of the best in his grand work, it serves excellently to explain the long accompanying description; and by this publication of a new species, the author gave a most valuable addition to the genus *Poa*.

The Linnean species of *Poa* in Europe were, at that time, not accurately characterised and distinguished. (Smith recognises for instance his new species in *Poa alpina* Huds., not L., and *P. glauca* With., not Fl. Dan.) Nevertheless he is perfectly successful in pointing out how to distinguish *P. subcaerulea* from the earlier species, especially *Poa pratensis*, laying stress upon the following marks (*Eng. Bot.*, t. 1004):—

"Whole plant glaucous" and "a blueish appearance" (Smith here evidently means a distinct pruina).

"Panicle shaped like that of *alpina*," viz., more crowded, with thicker and broader spikelets, more or less clustered together.

"Calyx almost awned," the glumes really being more cuspidate than in *pratensis*. As seen in the drawing, the branchlets of the panicle are very few and nearly erect instead of standing straight out.

There are specimens (3 individuals) of this species in the Ricks Museum (Herb. Stockholm), sent by Smith to Professor O. Swartz, in Stockholm. Although not so typical as later specimens, both from England and Sweden, they are quite recognisable. There is likewise a specimen in J. E. Smith's herbarium in the Linnean Society, London.

Unfortunately, Smith did not long maintain his new plant. In his *Compendium Fl. Brit.*, 1816, he published a new species, *Poa humilis* Ehrh. (this name, however, is a *nomen nudum*) and transferred *P. subcaerulea* to it as a mere synonym. In this way he in reality spoiled *P. subcaerulea* as a proper species, for in his description of the new *P. humilis* two species are mixed together. The fact is, that Ehrhart's *humilis* (*nom. nudum*), according to his original specimens, is a different plant from Smith's original *P. subcaerulea*. (I have given the name *Poa irrigata* to Ehrhart's *P. humilis* in *Botan. Notiser* 1905, and published an account of its differences from *P. subcaerulea* in *Botan. Notiser* 1926, p. 273.)

Nevertheless, *Poa subcaerulea* still exists in British Literature, but usually only as a variety of *P. pratensis*. The English authors seem to have underestimated it, probably because its variations in some cases make its peculiarities less striking, and there are also no doubt several hybrids of it with allied forms of *Poa*.

I devoted a closer study to Smith's *P. subcaerulea* during my attempts to make out the Danish plant, called *Poa costata*, drawn in *Flora Danica*, t. 2402, but not agreeing with the original *Poa costata* Schumacher. In Scandinavian handbooks it generally is inserted as a variety of *Poa pratensis* (*sensu latissimo*), but without any decisive marks, and it is often called an uncertain or "mystical" plant. This *Poa costata*, Fl. Dan., has been plentifully collected by Danish botanists, chiefly in Sjælland, so that there is no difficulty in getting true specimens of it in great number. After making a circumstantial description of this plant, and comparing it with the painting in *Fl. Danica*, I found that *Poa costata* is a proper species and identical with *P. subcaerulea* Sm. The name "*costata*" is later, and must moreover fall for the reason that the original specimens of Professor Schumacher's *Poa costata* which I had the advantage of having lent me from the Botanical Museum in Copenhagen, are quite different from the *P. costata* of *Fl. Danica* and later Danish authors.†

In this way I am able to state positively that the true *Poa subcaerulea* Sm. is also a Swedish species and not rare in southern Sweden, at least so far as Stockholm (about 60 degs. north latitude). In several parts it grows abundantly, particularly in woody meadows, or at the edges of groves and forests, generally on shady and sheltered places, more dry than moist. It differs at the first glance from other *Poa* forms in the greyish or whitish hue of the panicle, in the apex of the culm, in the sheaths and the outside of the blades and, furthermore, in the narrow and rhombic circumference of the panicle, its lower branches being very few, usually only in pairs, and not standing horizontally but more or less erect. I have also found that the spikelets are thicker than in *P. pratensis*, the transverse section being broadly elliptical. The subterranean branches of the stem are long, rather coarse, and loosely running in the soft leaf-mould, and the basal shoots are not densely tufted with the culm. It is characteristic of this species that the culm mostly has three fresh, green leaves, the blades of which are comparatively short, broad, and flat, not complicated, the uppermost close to the panicle, and the lowest one spreading out or rather recurved.

†Schumacher's original specimens are teratological plants of *P. angustifolia* (?), the flowers of which were destroyed by parasitic animals (*Anguillulides* ?), so that the whole panicle got abnormal, with the shape of a narrow spike, the spikelets being sessile, and the valvules wrinkled with prominent ridges at the veins, which evidently gave rise to the name *costata*. On the normal *costata* in *Fl. Danica*, this name seems rather to allude to the distinct lateral veins even of the lower glume, while the gluma of *P. pratensis* (*sensu stricto*) and of *P. angustifolia* usually lack the lateral veins.

ADDITIONS TO THE ADVENTIVE FLORA OF THE PORT OF  
CARDIFF.

By A. E. WADE, F.L.S. and R. L. SMITH.

The following is a list of species and localities additional to our contribution to the B.E.C. Report, vol. vii., pp. 999-1027 (1925) and embodies the result of work in the field during 1926.

The very large number of additional species noted is due to the unusual conditions which held last year. The ground over which grain-sifting had been scattered for several years has been partly converted into allotments. The digging over of the ground made it possible for introduced plants to grow much more freely and robustly and, no doubt, many seeds germinated which would not have done so on the comparatively hard surface of the original waste ground. Many long buried seeds were undoubtedly enabled to grow by the disturbance of the ground. The amount of decaying vegetable matter, making the ground really "warm," was responsible for the great luxuriance of the plants and assisted the seeds of such unusual aliens as *Citrullus vulgaris* and *Lagenaria vulgaris* to germinate, both of which flowered.

During early summer *Roemeria hybrida* came up in fair quantity over a small area, but it vanished after a week or so. A single example was found in October by our worthy secretary.

About 180 adventive species were noted at Splott during 1926, 43 of which were new to the Cardiff district.

The following is a list of species new to the Cardiff district. The species recorded from Splott are mostly grain-sifting introductions.

177. *WILCKIA MARITIMA* Scop. Mediterranean Region. Splott.  
 191 (2). *SISYMBRIUM RUNCINATUM* Lag. Mediterranean Region, Caucasus, Orient. Splott.  
 229. *ERUCA HISPIDA* Cav. Spain. Splott, in fair quantity.  
 231. *CARRICHTERA ANNUA* (L). Spain. Splott.  
 325. *TUNICA PROLIFERA* Scop. Europe, Caucasus Region. Splott.  
 339. *SILENE CONOIDEA* L. Europe, Orient. Splott.  
 350. *S. MUSCIPULA* L. Mediterranean Region. Splott, in fair quantity.  
 375. *CERASTIUM DICHOTOMUM* L. Mediterranean Region, Asia Minor. Splott.  
 490. *ERODIUM LACINIATUM* Willd. Mediterranean Region, Persia. Splott.  
 491. *E. MALACOIDES* Willd. Mediterranean Region, Orient. Splott.  
 530 (2). *LUPINUS HIRsutus* L. Mediterranean Region. Splott. A number of plants appeared but only one flowered.  
 577. *MEDICAGO RIGIDULA* Desv. Europe. Splott.  
 649 (6). *LOTUS CONIMBRICENSIS* Brot. Mediterranean Region. Splott.

664. *SCORPIURUS SULCATA* L. Mediteranean Region. Splott.  
 657. *ASTRAGALUS HAETICUS* L. Spain and Sicily. Splott. Abundant in 1926.  
 690 (2). *VICIA VESTITA* Boiss. Chile. Mediterranean Region. Splott.  
 701. *V. PEREGRINA* L. Mediterranean Region, Orient, North and Western India. Splott, Grangetown.  
 1074 (2). *LAGENARIA VULGARIS* DC. Tropical Regions. Splott. Flowered but did not fruit.  
 1074 (3). *CITRULLUS VULGARIS* Schad. Tropical Africa. Splott. Flowered but did not fruit.  
 1210. *ASPERULA ARVENSIS* L. Europe, Orient. Splott.  
 1291 (2). *AMBROSIA PSILOSTACHYA* DC. North America. Barry.  
 1308. *COREOPSIS TINCTORIA* Nutt. North America. Splott.  
 1410. *CALENDULA OFFICINALIS* L. S. Europe. Splott.  
 1474 (2). *CENTAUREA SALMANTICA* L. North Africa. Splott.  
 1485. *RHAGADIOLUS EDULIS* Gaertn. Mediterranean Region. Orient. Splott.  
 1486. *R. HEDYPNOIS* All. Mediterranean Region. Splott.  
 1661. *TRAGOPOGON CROCIFOLIUS* L. S. Europe. Splott.  
 1835. *CONVOLVULUS TRICOLOR* L. S. Europe. Splott.  
 1874. *LINARIA TRIPHYLLA* Mill. Mediterranean Region. Splott.  
 1890b. *ANTIRRHINUM ORONTIUM* L., var. *GRANDIFLORUM* Chav. Splott.  
 2020. *SALVIA AETHIOPIS* L. S. Europe, Orient. Canton.  
 2123. *CHENOPODIUM OPULIFOLIUM* Schrad., var. *MICROPHYLLUM*. Splott.  
 2130 (2). *C. INCISUM* Poir. Central America. Splott.  
 2133. *C. CAPITATUM* Asch. Northern and Southern Regions. Splott.  
 2210 (4). *RUMEX MAGELLANICUS* Gris. S. America. Cardiff, G. C. DRUCE.  
 2639b. *SETARIA VIRIDIS* Beauv., sub-var. *WEINMANNI* R. & F. Splott.  
 2639c. *S. VIRIDIS* Beauv., var. *NANA* Goiran. Splott.  
 2736. *LAMARKIA AUREA* Moench. Mediterranean Region, Orient. Splott.  
 2757. *BRIZA MINOR* L. Europe, Orient, N. Asia. Splott.  
 2807. *BROMUS COMMUTATUS* Schrad. Europe, N. Africa. Grangetown, Splott. b. *PUBESCENS* Wats. Splott.  
 2809. *B. ARVENSIS* L. Europe. Splott.  
 2815. *B. MACROSTACHYS* Desf. Mediterranean Region, West, North and Central Asia, N. Africa. Splott. d. *LANUGINOSUS* (Poir.). Splott.  
 2837. *TRITICUM TRIARISTATUM* G. & G. Europe. Splott.

The following are species already recorded for the Cardiff district, but not from the localities under which they are listed.

## SPLOTT.

63. *Delphinium Consolida* L. 84. *Papaver hybridum* L. 87. *Argemone mexicana* L. 91. *Roemeria hybrida* DC. 188. *Sisymbrium Irio* L. 217. *Brassica alba* Boiss. 461. *Hibiscus Trionum* L. 529. *Lupinus*

*angustifolius* L. 550. *Trigonella polycerata* L., var. *pinnatifida*.  
 554. *T. caerulea* Ser. 575. *Medicago Murex* Willd. 584. *M. ciliaris*  
 Willd. 602. *Trifolium ochroleucon* Huds. 623. *T. tomentosum* L.  
 632. *T. glomeratum* L. 656. *Astragalus hamosus* L. 667. *Coronilla*  
*scorpioides* Koch. 690. *Vicia narbonensis* L. 721. *Lathyrus Cicera*  
 L. 724. *L. Ochrus* DC. 1166. *Caucalis daucoides* L. 1201. *Galium*  
*tricornes* Stokes. 1411. *Calendula arvensis* L. 1742. *Anagallis femina*  
 Mill. 1789 (5). *Benthamia intermedia* Fisch. & Mey. 1810. *Asperugo*  
*procumbens* L. 2059. *Stachys annua* L. 2088. *Plantago Psyllium* L.  
 2390. *Asphodelus fistulosus* L. 2650. *Phalaris aquatica* L. 2074.  
*Lagurus ovatus* L. 2747. *Eragrostis cilianensis* V.-L. 2794. *Bromus*  
*rigens* L. 2799. *B. rubens* L. 2836. *Triticum ovatum* Rasp. 2838.  
*T. triunciale* L.

## CARDIFF DOCKS.

651. *Galega officinalis* L. 1771. *Gilia capitata* Sims.

## GRANGETOWN.

1463. *Centaurea melitensis* L. 2017. *Melissa officinalis* L.

## BARRY.

2112. *Amarantus albus* L.

## NATURE'S WAY FOR PRODUCING SPECIES.

## NATURE'S SCHEMING.

By E. ALMQUIST.

In a letter to Nageli in 1873 Mendel suggests the following case:—  
 By change of the environment a *Hieracium* produces hybrids; the original form disappears and some hybrid thrives. The same is repeated by new changes and a third form survives. This example really illustrates the way of building the flora.

The causality rules everywhere. We must leave the thought a priori that Nature breeds new forms in order to make them suitable for an environment. The crosses produce innumerable different hybrids, all combinations of the genes come out. Only the form that is fit for the place survives, all the others disappear. For the crosses all tendency is quite excluded. Perhaps the mutation also forms its varieties blindly. The hereditary mutations are not studied enough. We know the flos luxurians that appears ab alimento luxuriante, often in our cultures. The flowers become replete, important organs disappear at the same time. Among the mutants we find apetalous, pelorias, morbid monstrosities, etc., and often the variation is insignificant. With poor nutrition some pathogenic bacteria lose some genes and breed new constant forms (Fur Artbildung in der freien Natur. *Acta Horti Berg.* ix., 65,

1926). We know that many mutants are unable to persist. As far as we know no form is created in order to be suitable for its environment. Thus both hybrids and mutants seem to agree. The habitat type represents scarcely a genotypical response to the habitat. Lamarck suggested that the organs are changed by uses or non-uses. In this way varieties and the instinct may be trained, but not new genes won.

Species seem to be bred without Nature's tendency, but on the other side we are able to discover the scheme for the permanence of the life. In the favourable environment most forms tend to constancy. Then the production of less valuable forms is stopped. Another sample of scheming:—When the nutriment is finishing the fructification sets often in both for higher plants and bacteria. Then the seeds are able to find new and better environment. Also the circulation is of great importance for vegetation both in agriculture and in free nature. I have studied it in Siberia, especially on the Island of Bering. When the vegetation of *Empetrum* had reached the height of half a metre moss and lichens commence to luxuriate. They destroyed the *Empetrum* in a short time, the body turning quite naked. Then the same commences anew, first a thin layer of moss and lichens, shortly followed by the *Empetrum* ("Lichenenvegetation dis Beriaqsmacres," *Vegaexpedition Bot. iv.*, p. 529).

Science studies only the causality, how often an impulse, a change, set up the consequences. Plants produce an immense number of seeds and we observe the same forms growing everywhere in favourable localities. They are able to breed very different varieties, and we find new forms growing in the changed environment. The causality rules, but at the same time we are able to observe that it is well planned for organisms and the life. They thrive and fill up the earth. The Bacteria lose in starving cultures some genes, but the life survives although very reduced. Everywhere we are able to observe some plain advantages for the life.

In free nature existing plants fit in with their environment. All new forms that do not agree with their environment disappear.

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## BOTANISING IN THE HIGH TATRA.

By C. D. CHASE, M.C., M.A.

Probably for every thousand British tourists to Switzerland and the Tyrol not one visits the High Tatra region of the Carpathians in Slovakia. Twelve hours from Prague it is easily accessible; the hotels are excellent and the people, both Slovaks and Germans, most friendly. The present writer, with the Rev. G. H. Harris, spent the first three weeks of August 1926 partly at Strbské Pleso and partly at Lomnitzer. The High Tatra, which rises to some 8500 feet, is mostly granite, but the

eastern portion, easily reached from Lomnitzer, is limestone—the Beler Kalkalpen. The demarcation between the two formations is clearly marked, and it was very interesting to pass in a few steps from the flora of the granite to that, much more varied, of the Kalkalpen. We were fortunate in meeting Herr Vladimir Krajina, assistant to Professor Domin of the Prague Botanical Gardens. Herr Krajina was collecting plants for a garden of local alpine plants at Strbské, and he was good enough to name the plants which puzzled me, and also to give me a list of the more striking alpine plants found in the Beler Kalkalpen. Most of these I was fortunate enough to find though some, owing to the lateness of our visit, were out of flower. The following list is compiled partly from Herr Krajina's and partly from my own lists of daily gatherings. In the three weeks our visit lasted I noted about 450 plants in the Hohe Tatra, which contains (Herr Krajina is again the source of my information) about 1200 species of the 3000 known in the new country of Czechoslovakia. There is, unfortunately, no published Flora of the High Tatra, a deficiency, I told Krajina, I hoped he would some day make good. Meanwhile I hope the following list may be of use to some British field botanist who penetrates to this very interesting corner of Europe.

## SOME PLANTS GROWING IN THE BELER KALKALPEN.

*Clematis alpina*, *Ranunculus montanus*, *R. Thora*, var. *carpaticus*, *R. alpestris*, *R. rutaefolius*, *Delphinium elatum*, *D. oxysepalum*, *Petrocallis pyrenaica*, *Hutchinsia alpina*, *Cochlearia Tatras*, *Kernea saxatilis*, *Arabis sudetica* Tausch, *A. arenosa*, *A. Halleri*, *A. Tatras*, *A. alpina*, *A. Jacquini* Beck., *Draba tomentosa* Wahl., *D. aizoides*, *D. nemorosa*, *Viola sudetica* Willd., *V. alpina*, *Polygala amara*, *Silene acaulis*, *Gypsophila repens*, *Dianthus glacialis*, *D. speciosus*, *D. praecox*, *Sagina Linnaei*, *Arenaria laricifolia*, *A. sedoides*, *A. verna*, *A. muscosa*, *A. ciliata*, *Cerastium alpinum*, *C. lanatum*, *C. latifolium*, *Linum extra-axillare*, *Astragalus alpinus*, *A. oroboides*, *A. australis*, *Oxytropis sericea*, *O. carpatica*, *O. campestris*, *Hedysarum obscurum*, *Anthyllis alpestris*, *Onobrychis alpina*, *Potentilla alpestris* Hall., *Dryas octopetala*, *Cotoneaster tomentosa* Lindl., *C. vulgaris* Lindl., *Helianthemum alpestre*, *H. grandiflorum*, *Parnassia palustris*, *Sedum alpestre*, *S. atratum*, *S. carpaticum*, *S. Rhodiola*, *Saxifraga aizoon*, *S. aizoides*, *S. Bellardi* All., *S. androsacea*, *S. perdurans*, *S. oppositifolia*, *S. caesia*, *Bupleurum ranunculoides*, *B. longifolium*, *Scabiosa lucida*, *Erigeron neglectus*, *E. uniflorus*, *E. carpaticus*, *Aster alpinus*, *Bellidiastrum Michellii*, *Artemisia petrosa*, *Senecio capitatus* Wahl., *S. crispatus*, *Carduus glaucus* Baum., *Saussurea alpina*, *S. macrophylla*, *S. pygmaea* Jacq., *S. discolor* Willd., *Leontopodium alpinum*, *Leontodon incanus* Schrk., *L. taticus*, *Phyteuma orbiculare*, *Campanula pusilla*, *C. Scheuchzeri*, *Pinguicula alpina*, *P. vulgaris*, *Androsace lactea*, *A. chamaejasme* Wulf., *Primula Auricula*, *P. carpatica*, *Cortusa Matthioli*, *Soldanella hungarica*, *Pyrola rotundifolia*, *P. uniflora*, *Gentiana carpatica* Wetst., *Pedicularis Haquetii* Graf., *Veronica aphylla*, *Euphrasia salisburgensis*, *Thesium alpinum*, *Salix Jacquini*, *S. reticulata*, *S. hastata*, *S. nigricans*, *Tofieldia caly-*

*culata* Wahl., *Lilium Martagon*, *Lloydia serotina*, *Allium sibiricum*, *A. montanum*, *Chamaeorchis alpina*, *Orchis globosa*, *Goodyera repens*, *Corallorrhiza innata*, *Malaxis monophyllos* Siv., *Juncus filiformis*, *Eriophorum Scheuchzeri* Hopp., *Scirpus uniglumis*, *Carex atrofusca* Schk., *C. fuliginosa* Schk., *C. capillaris*, *Phleum Michelii* All., *Sesleria caerulea*, *Trisetum alpestre*, *T. carpaticum*, *Festuca varia*, *F. carpatica*, *Athyrium alpestre*, *Cystopteris regia*, *C. sudetica*, *C. montana*, *Polystichum lobatum*, *P. Braunii*, *Nephrodium Robertianum*, *Asplenium viride*, *Botrychium Lunaria*, *Equisetum hyemale*, *E. variegatum*, *Selaginella selaginoides*.

### QU'EST-CE QUE LE SOLANUM DILLENII SCHULTES ?

PAR M. A. THELLUNG (ZURICH).

En 1874, T. A. Schultes (*Oesterr. Flora*, ed. 2, i., p. 393) a publié un *Solanum Dilleni* de la manière suivante:—

“868. *Dillenius* N[achtschatten]. (*S. Dilleni* Nob.).—Die Aeste rund, unbehaart; die Blätter vollkommen ganzrandig, unbehaart. Dillen. Hort. Eltham., t. 275, fig. 355. *S. patulum* \* Pers. Syn., S. 224, n. 54, \*†. (Da Persoon Syn., S. 223, n. 38, noch ein anderes *S. patulum* aus der *Fl. Peruv.* aufführt, so nannte ich dieses nach seinem ersten Beschreiber, dem unsterblichen Dillenius. Hr. Prof. Kitaibel fand das exemplar, das ich vor mir habe, in den Wäldern der Matra; die eiförmigen Blätter stehen horizontal ab; die viel kleineren Blumen entspringen mit mehr fadenförmigen Blumenstielen weiter von den Gelenken entfernt, und sind armblüthiger; die afterdolden mit ihren Früchten aufrecht abstehend.)”

On voit tout de suite que l'espèce de Schultes est un mélange, composé de deux éléments différents: (1) le *Solanum procerius patulum*, *vulgaris fructu* Dillen. Hort. Eltham. ii., p. 367, t. 275, fig. 355, 1732, devenu plus tard *S. nigrum*,  $\beta$  *patulum* L. Sp. Pl., ed. i., p. 186, 1753; (2) une plante de l'herbier de Kitaibel, différant du type de Dillenius par plusieurs caractères, mis en évidence par Schultes même, et qui appartient, d'après les investigations récentes de M. S. Polgár (*Bot. Közlem.* xxiii., pp. 30 seg., 1926), au *S. nodiflorum* Jacq. (cette dernière espèce est bien caractérisées vis-à-vis du *S. nigrum* L. et de la plupart des espèces voisines, par des filaments des étamines glabres). C'est une espèce tropicale de dispersion imparfaitement connue (à cause de confusions fréquentes avec des espèces voisines)<sup>1</sup>; il va sans dire qu'elle ne vient pas dans les bois de la Hongrie, comme le prétend l'étiquette

<sup>1</sup>Ainsi le *S. "nodiflorum"* de Wright in *Fl. Trop. Afr.* iv./2, ii., p. 218, 1906, est une espèce collective, englobant, outre le vrai *S. nodiflorum* Jacq., des formes du *S. nigrum* L. à feuilles entières et glabres (= *S. nigrum*, var. *Dilleni* A. Gray Synopt. Fl. N. Am. ii. 1, p. 228, 1878 ? ex descr., excl. syn et le *S. guttense* (L.) Lam. et auct. non L. (espèce différent *toto caelo* du *S. nodiflorum*).

de Kitaibel, mais elle était cultivée dans les jardins botaniques à la fin du xviii. et au commencement du xix. siècle.

Maintenant, quel est le type de *S. Dillenii* Schultes? Il ressort du texte que c'est la plante de Dillenius (que Schultes n'avait pas vue *in concreto*, mais qu'il juge d'après la description et la planche données par l'auteur), et qu'on peut négliger, pour ce qui concerne la question de nomenclature, la plante de Kitaibel (= *S. nodiflorum* Jacq.). Il convient d'ajouter que Reichenbach a encore mal interprété le *S. Dillenii*, puisqu'il décrit et figure (*Fl. Germ. Excurs.*, sect. 1, p. 391, 1830, et *Ic. Pl. Crit.* x., p. 20, fig. 1285, 1832, sous ce nom, le *S. guineense* (L.) Mill., Lam. et auct. (non L.<sup>1</sup>, comme l'a mis en évidence M. Polgár (*l.c.* 1926).

Il faut donc avoir recours à la plante originale de Dillenius. La description et la planche, tout en étant bonnes pour l'époque, sont insuffisantes pour reconnaître l'espèce avec certitude, ce qu'il faut du reste dire de toutes les descriptions des espèces de la section "Morella" antérieures à 1910 environ. En effet, la systématique moderne de ce groupe, inaugurée par l'excellent monographe M. G. Bitter, exige qu'on étudie et indique avec soin, pour chaque espèce, à part les caractères

<sup>1</sup> *S. guineense* (L.) Miller Gard. Dict., ed. 8, nr. 7, 1768 (saltem ex syn. Boerh.) !! (nomen neglectum) et Dict. Jard. vii., p. 131, nr. 7, 1785; Lam. Illust. ii., p. 18, 1793, non Linn. Spec. Pl., ed. 1, p. 184, 1753 (species Capensis admissa; syn. *S. guineense* (sphaalm.) Hill Veg. Syst. ix., p. 34, 1765 (cum ic. valde dubiosa!) *S. laurinum* Burm. fil., Fl. Cap. Prodr. p. 5, 1768 (sine descr., cum cit. fig. *Comelyni*) teste Bitter in *Fedde Repert. spec. nov.* xvi., No. 25/30, p. 407, 1920; *Atropa solanacea* L. Mant. ii., p. 205, 1771; *A. viscosa* Hort., ex Bitter, *l.c.*: *Sol. aggregatum* Jacq. Coll. iv., p. 124, 1790, et *Ic. Plant. Rar.* ii., p. 10, tab. 323, 1786-93. Le *S. guineense* (L.) Mill. et auct. rec. (syn.: *S. nigrum*, *S. guineense* Linn. Spec. Pl., ed. 1, p. 186, 1753; *S. guineense* (sphaalm.) Chazelles in *Mill. Dict. Jard.* vii., p. 124, nr. 7, 1785) ne peut donc garder son nom traditionnel pour cause d'homonymie; ne connaissant pas de dénomination valable pour cette espèce, je propose pour elle le nom de *S. Boerhaavii* Thell. nom nov. C'est une espèce des jardins botaniques, dont l'origine n'est pas connue avec certitude (elle ne vient sûrement pas de la Guinée, comme le ferait penser son nom botanique; M. Bitter (in *Engl. Bot. Jahrb.* xlix., p. 561, 1913, et *in litt.*) qui a élevé la plante de graines provenant des Indes occidentales (Isla de Pinos au Sud de Cuba), pense qu'elle pourrait être spontanée). Elle fut d'abord mentionnée par Boerhaave (*Ind. Alt. Pl. Hort. Lugd. Batav.* ii., p. 68, nr. xvii., 1720, 1727, sous le nom de *Solanum guineense*, fructu magno, instar Cerasi nigerrimo, et décrite et figurée ensuite par Dillenius (*Hort. Eltham.* ii., p. 366, et tab. 274, fig. 354, 1732) sous cette même désignation. D'autres synonymes certains de cette espèce sont, comme nous venons de constater: *S. Dillenii* Rchb. Fl. Germ. Excurs. sect. i., p. 391, 1830 (excl. syn. Dill.) et *Ic. Pl. Crit.* x., p. 20, fig. 1285, 1832) non Schultes; *S. nodiflorum* C. H. Wright in Thiselton-Dyer *Fl. Trop. Afr.* iv./2, p. 218, 1906, pr. p., non Jacq. Le *S. scabrum* Mill. Gard. Dict., ed. 8, nr. 6, 1768, que Dunal in *DC. Prodr.* xiii./1, p. 49, 1852, donne (sur la foi d'échantillons de l'herbier Banks) comme synonyme du *S. guineense* Lam., correspond en réalité, quant au synonyme Dill. fig. 356 (= *S. nigrum*  $\epsilon$  *virginicum* L.), au *S. pterocaulon* Dun. Dunal cite en outre, comme synonyme du *S. guineense*, le *S. tenuiflorum* Steudel *Nom. Bot.*, ed. 2, ii., p. 606, 1841 (fondé sur le *S. nigrum* Vell. Fl. Flum. ii., tab. 109, 1827, 1835, non L.), sur la foi de Sendtner, qui rapporte la planche de Vellozo à son *S. nigrum*  $\gamma$  *angulosum* (in Mart *Fl. Brazil* fasc. 6, Solan., p. 16, 1846); mais il paraît très improbable que cette plante brésilienne corresponde réellement au *S. guineense* auct., comme l'admet Dunal.

macroscopiques, l'indument des parties végétatives (étudié au microscope), la longueur et l'indument des filaments des étamines et du style et surtout les grains sclérenchymatiques du péricarpe<sup>1</sup>), dont la présence ou absence, le nombre et les dimensions sont très caractéristiques pour l'espèce. M. le Dr G. C. Druce à Oxford, avec son obligeance habituelle, a bien voulu me confier le précieux original du *Sol. procerius patulum* Dill., pour une étude approfondie. Il en résulte la description détaillée suivante :

*Solanum Dillenii* Schultes (= *S. nigrum*  $\beta$  *patulum* L. = *S. \** *patulum* Pers. Encheir. i., p. 224, nr. 54, 1805 (nec p. 223, nr. 38, species peruviana admissa), vix (vel pro minima parte tantum Roth 1800<sup>2</sup>, descr. emend. ex specimine authentico in herb. Dilleniano conservato : Planta herbacea annua (ex Dill.); de habitu confer descriptionem et iconem Dillenii. Ramus in herbario asservatus 30 cm. longus (ramulis secundariis auctus), basi 3 mm. crassus, exsiccatione anguloso-sulcatus, leviter alato-lineatus (lineis in statu sicco vix perspicuis) leviter puberulus (setulis minutis vix 1-4 mm. longis 3-cellularibus acutis sursum curvatis). Folia anguste ovata utrinque acuminata, limbo ad 10 cm. longo et 4 cm. lato, in petiolum alatum 1-2 cm. longum contracta, integerrima, superne brunneo-viridia, inferne pallidiora, in utraque facie et margine

<sup>1</sup>Bitter, G. Steinzellkonkretionen im Fruchtfleisch beerentragender Solanaceen und deren systematische Bedeutung. Engl. Bot. Jahrb. xlv., H. 4, pp. 483-507 1911. Id., Weitere Untersuchungen über das Vorkommen von Steinzellkonkretionen im Fruchtfleisch beerentragender Solanaceen. Abh. Naturwiss. Ver. Bremen xxiii., 1, pp. 114-163, 1914.

<sup>2</sup>*S. patulum* Roth Catal. Bot. ii., p. 23, 1800. L'auteur, tout en citant *S. nigrum*  $\beta$  *patulum* L. et Dill., fig. 355, donne de son espèce une description nouvelle et détaillée, qui ne s'applique pas mal, en général, il est vrai, au *S. Dillenii*; toutefois les points suivants de la diagnose font douter de l'identité des deux plantes et semblent indiquer que Roth a en sous les yeux plutôt le *S. nodiflorum* Jacq., souvent cultivé à cette époque-là (malheureusement la diagnose reste muette sur des caractères essentiels tels que l'indument des filaments) : "Caulis teres glaberrimus . . . nodis oblongis subincrassatis . . . folia . . . glaberrima . . . Cyma . . . infra dichotomias e caule ramisque egredientes (chez le *S. nodiflorum*, les pédoncules naissent peu au-dessous des nœuds, chez le *S. Dillenii*, par contre, peu au dessus du milieu des entrenœuds—Th.) . . . Pedunculi glabri . . . Pedicelli . . . filiformes, floriferi decurvi, fructiferi adscendentes . . . Flores exigui . . . Calyx perexiguus . . . laciniis ovalibus obtusissimis . . . Corolla duo, raro tres lineas in diametro habens." J'hésite toutefois à identifier l'espèce de Roth directement avec le *S. nodiflorum* Jacq., 1788, les caractères suivants ne s'appliquant pas bien à l'espèce de Jacquin : "Folia . . . obtusa . . . Pedunculi . . . sesqui-adbiunciales . . . Baccæ erecto-patulae, magnitudine baccarum Rhamni Frangulae (sic) ante maturitatem punctis exiguis albis adpersae, in disco macula nigra notatae." Le fruit du *Frangula Alnus* ont un diamètre de 8 mm. environ, tandis que les baies du *Sol. nodiflorum* sont ordinairement plus petites. Si la ponctuation du fruit avant la maturité devait indiquer des granules sclérenchymatiques, il ne saurait s'agir du *S. nodiflorum*, dont les baies sont dépourvues de ces granules d'après M. Bitter (Abh. Naturw. Ver. Bremen xxiii., 1, p. 138, 1914). Plus tard, comme me le fait remarquer M. Polgár (*in litt.*), Bernhardt a également assimilé—à tort—la plante de Dillenius au *S. nodiflorum*, puisqu'il donne (Ueber den Begriff des Pflanzenart p. 51, 1837, comme synonymes de cette dernière espèce : *S. scabrum* Mill. ?, *S. Dillenii* Schultes, *S. strictum* Zucc., *S. patulum* Pers. n. 54  $\beta$  et *S. nigrum patulum* L.

sparsae puberula (pilis eis caulis similibus). Inflorescentiae extraaxillares umbelliformes, pauci (3-5) florum, pedunculo satis robusto tereti puberulo pedicellis longiore (!)<sup>1</sup> (2-3 cm. longo). Pedicelli puberuli, floriferi circ. 4 mm. longi, fructiferi patuli ad 8 mm. longi sursum versus sensim incrassati (apice 3.4-7.8 mm. crassi). Calyx florifere parvus (1½ mm. longus), setulis minutis sursum adpressis puberulus, dentibus triangulari-ovatis minutis acutiusculis tubo subduplo brevioribus; fructifer auctus, 2½ mm. longus, dentibus triangularibus acutiusculis 2 mm. longis et basi fere totidem latis. Corolla satis parva, 5 mm. longa<sup>2</sup>, extus minute setuloso-puberula. Antherae oblongae, 1.75 mm. longae; filamenta multo breviora, dense villosa pilis circ. 6-cellularibus. Pollinis granula 0.022-0.023 mm. longa, 0.018 mm. lata. Stylus antheras vix superans, apice geniculato-curvatus ad medium usque breviter villosus pilis elongatis (circ. 4-cellularibus, ± ¼ diametri styli attingentibus) horizontalibus, acutis, medium styli versus decreescentibus; stigma depresso-globosum. Bacca globosa, ex cl. Dill. demum nigra, 7-8 mm. diam.; semina valde numerosa, circ. 1½ mm. longa; granula sclerenchymatica 10-11, sphaeroidea vel late ellipsoidea, ½-(fere) 1 mm. longa.

Ni le texte de Dillenius ni l'étiquette de son herbarium ne donnent de renseignements sur la provenance de l'échantillon original, il faut tâcher d'identifier la plante uniquement par la voie de la comparaison morphologique. M. le Dr S. Polgár à Győr (Hongrie), que je remercie à cette occasion bien sincèrement de son aimable concours, me fait remarquer que parmi toutes les espèces publiées de la section *Morella*, le *S. nigrescens* Mart. et Gal. (En. Syn. Pl. Phan. Galcotti Mex. in *Bull. Acad. Bruz.* xii., p. 140, 1845; Schlechtend. Pl. Leib. in *Linnaea* xix., p. 300, n. 69, 1847, est la plus voisine de la plante de Dillenius, surtout par la configuration des granules sclerenchymatiques qui sont au nombre de 11 par baie dans un échantillon authentique de l'herbier du Musée d'Histoire naturelle de Vienne, d'après M. Bitter (in *Abh. Naturw. Ver. Bremen* xxiii., p. 139, 1914). Dunal (in DC. *Prodr.* xiii, 1, p. 49, nr. 53, 1852) caractérise cette espèce comme suit: "Caule herbaceo glabriusculo, foliis solitariis geminis inaequalibus longe petiolatis ovato-lanceolatis integerrimis utrinque attenuatis pubescenti-pilosis, pedunculis lateralibus pubescentibus umbelliferis floribus parvis reflexis, calyx parvulo 5-fido, laciniis ovatis. 1. Ad ripas rivulorum jugi Mexicani Taveziae (Gal. n. 1238)<sup>3</sup>. Folia 1-2 pollicaria. Pedunculis pollicares, pedicellis majores. Corolla 5-partita, ¼-pollicaris. Bacca sphaerica, nigrescens. Affine ex cb. auct. *S. nigro* L. sed foliis angustioribus longius petiolatis diversum." On voit que cette description concorde assez bien

<sup>1</sup>In icône Dilleniana pedunculus inaccurately pedicellis subaequilongus delineatus est.

<sup>2</sup>De forma corollae, in specimine herbarii pessime conservatae, nihil certi dici potest; sed confer iconem Dillenianam, ubi corolla 8 mm. diam., laciniis triangulari-ovatis 3 : 2-2½ mm.

<sup>3</sup>Hemsley (Bot. Centr. Am. Bot. ii., p. 411, 1882, indique : Cordillera of Oaxaca, 7000 feet.

avec celle du *S. Dillenii*. Le fait que les feuilles de cette dernière espèce sont notablement plus grandes et plus glabres,<sup>1</sup> s'explique probablement par l'effet de la culture. Mais n'étant pas renseigné sur les caractères floraux (étamines et style) du *S. nigrescens*, je n'ose pas, pour le moment, réunir les deux espèces.

Il résulte de cette étude que le *Solanum procerius patulum* Dill. (= *S. nigrum*  $\beta$  *patulum* L. = *S. patulum* Pers. nr. 54, 1805 (vix Roth 1800, nec R. P., ex Pers., nr. 38, 1805), = *S. Dillenii* Schultes) est spécifiquement distinct du *S. nigrum* L., surtout par la présence de 10 à 11 granules sclérenchymatiques par baie. Il partage ce caractère avec l'espèce mexicaine. *S. nigrescens* Mart. et Gal., dont la plante de Dillenius pourrait bien être une forme culturale.

Pour être complet, il convient d'ajouter que l'herbier de Dillenius contient, sous le même nom dillénien, encore deux échantillons, provenant de l'herbier Sherard et que M. le Dr Druce, a également bien voulu me communiquer pour l'étude (ils possèdent tous les deux, comme le *S. Dillenii*, les feuilles à bords  $\pm$  entiers et glabrescents et les filaments des étamines, et les styles dans leur moitié inférieure densément poilus :

1. "441. *Solanum procerius patulum, vulgaris fructu Hort. Elth.*—Chelsea, from Barbados fields." Feuilles, frappamment petites (atteignant jusqu'à 4: 2½ cm.). Caractères floraux du *S. Dillenii* (anthères longues de presque 2 mm.), mais inflorescences ordinairement 7-flores. Baies plus petites (jusqu'à 6½ mm. de diamètre); granules sclérenchymatiques  $\pm$  4, de 0.3-0.4 mm. de diamètre. Cette plante, cultivée à Chelsea près Londres et provenant sans doute, comme l'indique l'étiquette, des Indes Occidentales, correspond parfaitement à la plante de cette région décrite par M. O. E. Schulz (in Urban *Symbolae Antillanae* vi., 1, p. 160, 1909, comme *S. nigrum, \gamma americanum* (Mill. pro. spec.). Je ne connais pas de dénomination sûre pour cette plante; il me paraît peu probable que ce soit le vrai *S. americanum* Mill. (de l'Amérique du Nord). Il faut probablement chercher le nom valable parmi les espèces suivantes, citées par M. O. E. Schultz (*l.c.*, pp. 161-2) en synonymie de son *S. nigrum, var. americanum*: *S. strictum* Zucc., 1809, *S. oleraceum* L. C. Rich. ap. Dunal in Poiret 1813, *S. Desvauzii* Hamilt., 1825, *S. caribacum* Dunal 1852; mais toutes les descriptions étant insuffisantes au point de vue de la systématique moderne, il est impossible de rien décider sans une étude soigneuse des échantillons originaux. Il convient d'ajouter que le *S. nigrum, var. americanum* O. E. Schulz se compose comme le fait remarquer M. Bitter (in Engler's *Bot. Jahrb.* xlv., pp. 490-1, 1911, de deux entités (espèces) différentes, l'une munie, l'autre dépourvue de granules sclérenchymatiques dans le péricarpe.

2. "442. *Solanum procerius patulum vulgaris fructu.*—*Sol. Indicum vulgari simile sed procerius floribus albis parvis Pl (uk.). Almq (a.).* 349." Feuilles plus petites que chez le *S. Dillenii* (atteignant jusqu'à 6: 4½ cm.), relativement plus larges. Inflorescences 4-5 flores. Fleurs petites (longues de 4 mm. environ). Anthères plus courtes

<sup>1</sup>Celles du *S. nigrescens* sont assez fortement poilues (Bitter *in litt.*).

que chez les deux autres plantes (longues de 1 à 1.25 mm.) et relativement plus larges. Filaments relativement plus longs (égalant presque l'anthère). Baies de 7 à 8 mm. de diamètre; granules sclérenchymatiques au nombre de 5, de 0.3 à 0.6 mm. de diamètre. Cette plante peut, à la rigueur, rentrer également dans le *S. nigrum*, var. *americanum* (sensu lato); elle diffère du *S. nodiflorum* par les filaments poilus et par les granules du péricarpe.

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## NOTES ON THE DISTRIBUTION OF PANSIES IN ENGLAND AND WALES.

By ERIC DRABBLE.

The Editor has asked me to give some account of the distribution of the British pansies. In the present communication no attempt is made to furnish more than a list of localities in England and Wales from which I have examined specimens during the last few years. Many collectors have sent me plants to be named and, in accordance with the Editor's desire, the name of the collector has in most cases been entered in the list, but it must clearly be understood that *I alone am responsible for the identifications.*

In collaboration with my friend, Dr Alfred Brammall, lecturer in Geology at the Imperial College of Science, an investigation is being conducted into the distribution of the pansies on the various geological formations. It is hoped that this may be ready for publication towards the end of this year. A more detailed examination of the nature of the soils in which the different species grow is in progress, but this will necessarily occupy some considerable time, as water relationships, calcium content, pH values, and other factors must be determined.

Errors in the spelling of place-names in the following list must almost inevitably occur. Labels are not always very legibly written—but it would ill become the present writer to pursue this subject! As far as practicable every name has been checked by reference to Newnes' Gazetteer of the British Isles.

I shall always be glad to examine specimens on condition (1) that whole plants, including the underground parts, be sent, (2) that sufficient material be furnished to allow me to keep a representative specimen for reference and further study. Notes on habitat and nature of the soil would be useful.

The Scottish and Irish pansies are still under investigation. More gatherings would be welcome, but collectors from these countries must not look for a prompt reply.

For excellent and very useful material I am particularly grateful to Dr Druce, Mr J. E. Little, the Rev. H. J. Riddelsdell and Mr W. H. Pearsall.

## CORNWALL (1, 2).

- V. agrestis* Jord.—Gilly Tresamble (F. H. Davey); Perranarworthal (H. Drabble).  
*V. Déséglisei* Jord.—Lizard (E. Drabble); Saltash.  
 f. *subtilis* (Jord.)—Truro (E. & H. Drabble).  
*V. segetalis* Jord.—Gilly Tresamble (F. H. Davey); Old Kea, Truro (E. & H. Drabble); Perranarworthal (H. Drabble).  
 f. *obtusifolia* (Jord.)—Lizard (E. Todd); Mevagissey (F. H. Davey).  
*V. ruralis* Jord.—Saltash.  
*V. anglica* Drabble—Truro (E. & H. Drabble).  
*V. Lejeunei* Jord.—Truro (E. & H. Drabble).  
*V. variata* Jord.—Lizard (E. Drabble); St Just (J. Groves).  
*V. lutea* Huds., f. *Curtisii* (Forster). (*Forsteri* H. C. Wats.)—Lands End (W. Curnow); Sennen (F. J. Hanbury).  
*V. nana* DC.—Scilly (W. Curnow).

## DEVONSHIRE (3, 4).

- V. agrestis* Jord.—Stoke Rivers (W. P. Hiern).  
*V. Déséglisei* Jord.—Belstone (W. C. Barton).  
 f. *subtilis* (Jord.)—Newton St Cyres (W. P. Hiern).  
*V. segetalis* (Jord.)—Chawleigh, Foxworthy, Sherwell (W. P. Hiern).  
 f. *obtusifolia* (Jord.)—Thorverton (W. P. Hiern); Waddlesdown.  
*V. arvatica* Jord.—Ashburton (C. E. Larter); Belstone (W. C. Barton); Coldridge (W. P. Hiern).  
*V. contempta* Jord.—Crediton Hamlets (W. P. Hiern); Newcot (H. J. Riddelsdell).  
*V. Lloydii* Jord.—Ashburton (E. S. Todd).  
*V. variata* Jord.—South Molton (H. Saunders).  
 var. *sulphurea* Drabble—South Molton (H. Saunders).  
*V. lutea* Huds., f. *Curtisii* (Forster). (*Forsteri* H. C. Wats.)—Braunton Burrows (E. M. Holmes); Instow, Northam (W. P. Hiern).

## SOMERSET (5, 6).

- V. agrestis* Jord.—Failand (I. M. Roper); Bishport, Chipstable, Milton Clevedon, West Monkton (E. S. Marshall).  
*V. Déséglisei* Jord.—Failand (I. M. Roper).  
 f. *subtilis* (Jord.)—Ashton Gate (I. M. Roper).  
*V. segetalis* Jord.—Compton, Wington (E. S. Marshall).  
 f. *obtusifolia* (Jord.)—Shipham (I. M. Roper); West Monkton (E. S. Marshall).  
*V. ruralis* Jord.—Wraxall (J. W. White).  
*V. arvatica* Jord.—Chipstable (E. S. Marshall); Pill (I. M. Roper).  
*V. contempta* Jord.—Milton Clevedon (E. S. Marshall); Wraxall Hill (J. W. White).  
*V. variata* Jord.—Barwick.  
*V. lepida* Jord.—Barrington (I. M. Roper).  
*V. lutea* Huds.—Exford, Winsford (E. S. Marshall).

## WILTSHIRE (7, 8).

- V. Déséglisei* Jord., f. *subtilis* (Jord.)—Aldbourne (G. C. Druce).  
*V. segetalis* Jord.—Aldbourne (E. S. Todd).  
*V. arvatica* Jord.—Marlborough.  
*V. derelicta* Jord.—Aldbourne (E. S. Todd).  
*V. Lloydii* Jord.—Badbury.

## DORSET (9).

- V. agrestis* Jord.—Broadstone (Miss Harris); Wool (G. C. Druce).  
*V. Déséglisei* Jord.—Wool (G. C. Druce).  
*V. contempta* Jord.—Morden Decoy (E. F. Linton).  
*V. Lloydii* Jord.—Kinson (E. F. Linton).  
*V. variata* Jord., var. *sulphurea* Drabble—Blanford (E. F. Linton).

## ISLE OF WIGHT (10).

- V. agrestis* Jord.—Freshwater (E. & H. Drabble).  
*V. segetalis* Jord.—Alverstone (1869).  
*V. ruralis* Jord.—Newport, St Lawrence (G. C. Druce).  
*V. anglica* Drabble—Freshwater (E. & H. Drabble).  
*V. victensis* F. N. Williams—Bembridge (C. E. Palmer).

## HAMPSHIRE (11, 12).

- V. agrestis* Jord.—Alresford (G. C. Druce); Winchester (J. Comber);  
 Liphook.  
*V. segetalis* Jord.—Albury Hill.  
 f. *obtusifolia* (Jord.)—Hursley (G. C. Druce); Odiham (C. E. Palmer).  
*V. ruralis* Jord.—Odiham (C. E. Palmer); Hurlston (G. C. Druce).  
*V. latifolia* Drabble—Alresford (G. C. Druce); Odiham (C. E. Palmer).  
*V. arvatica* Jord.—Itchin Abbas (R. W. Butcher); Odiham (C. E. Palmer).  
*V. contempta* Jord.—Odiham (C. E. Palmer).  
*V. Lejeunei* Jord.—Odiham (C. E. Palmer); Christchurch.  
*V. variata* Jord., var. *sulphurea* Drabble—Odiham (C. E. Palmer).  
*V. monticola* Jord.—Odiham (C. E. Palmer).  
*V. lepida* Jord.—Christchurch.

## SUSSEX (13, 14).

- V. agrestis* Jord.—Hellingley (E. Bray); Selham.  
*V. Déséglisei* Jord.—Hellingley (E. Bray).  
 f. *subtilis* (Jord.)—Hellingley (E. Bray).  
*V. segetalis* Jord.—Horsham (E. Drabble).  
*V. ruralis* Jord.—Bexhill (E. Drabble); Selham (E. S. Marshall).  
*V. anglica* Drabble—Bexhill (E. Drabble).  
*V. Lloydii* Jord.—Newmarket.  
*V. Lejeunei* Jord.—Mayfield (W. Borrer); Crowborough.

- V. variata* Jord.—Bexhill (H. L. Green); Brighton (E. Drabble); Borden Wood (J. E. Little); Barcombe, Battle.  
*V. lepida* Jord.—Chailey (P. Hilton).

## KENT (15, 16).

- V. agrestis* Jord.—Meopham (C. E. Britton).  
*V. Déséglisei* Jord.—Grove Park (J. Groves); West Wickham (J. E. Little); Benenden, Bexley.  
     *f. subtilis* Jord.—Cobham (E. Drabble); Stone.  
*V. segetalis* Jord.—Folkestone (C. Bailey); Wye.  
     *f. obtusifolia* (Jord.)—Cobham (E. Drabble).  
*V. ruralis* Jord.—Cobham (E. Drabble); Longfield, Meopham Green (C. E. Britton); Littlestone on Sea (G. C. Druce).  
*V. anglica* Drabble—Folkestone (W. R. Sherrin); St Margaret's Bay.  
*V. contempta* Jord.—Cobham (E. Drabble); Stone.  
*V. Lloydii* Jord.—Bexley (1852).  
*V. Lejeunei* Jord.—Sawley (E. S. Marshall); Seven Oaks, Tonbridge, Tunbridge Wells (E. Drabble).  
*V. variata* Jord.—Ide Hill (C. E. Salmon).  
     *var. sulphurea* Drabble—Chatham, Nurstead (C. E. Britton); East Wickham.  
*V. alpestris* Jord.—Luddesdown.  
*V. cantiana* Drabble—Seven Oaks (E. Drabble); Ashurst (E. B. Bishop).  
*V. lepida* Jord.—Knockholt (S. E. Chandler); Sandling Park, Seven Oaks, Tunbridge Wells (E. Drabble); Wrotham (C. E. Britton); Seal.

## SURREY (17).

- V. agrestis* Jord.—Cheam (Miss Harris); Croydon (A. Bennett); Ham, Sanderstead (E. Drabble); Hindhead (C. Bailey); Leigh (C. E. Salmon); Pyrford (G. C. Druce); Worplesdon (W. R. Linton); Wotton (W. R. Sherrin).  
*V. Déséglisei* Jord.—Barnes (E. Drabble); Coulsdon, Wotton (C. E. Britton); Chiddingfold, Godalming.  
     *f. subtilis* (Jord.)—Clandon Downs, Coulsdon Common (C. E. Britton).  
*V. segetalis* Jord.—Ham, Reigate (E. Drabble); Byfleet, Weybridge.  
     *f. obtusifolia* Jord.—Send, West Horsley (C. E. Britton); Compton, Godalming.  
*V. ruralis* Jord.—Albury (J. Comber); Banstead, Farley Heath, Farthing Down (C. E. Britton); Chobham, Lower Morden (W. A. Todd); Croham Hurst, Epsom (J. E. Lousley); Guildford, West Horsley (E. Drabble); Shere (C. E. Salmon); Wisley (F. J. Chittenden); Woodham.  
*V. latifolia* Drabble—Guildford, Headley (E. Drabble); Pyrford (G. C. Druce); Wisley (F. J. Chittenden); Godalming.  
*V. anglica* Drabble—Clandon, Farthing Down (C. E. Britton); Cobham (E. Drabble); Godstone (C. E. Salmon).

- V. arvatica* Jord.—Guildford (E. Drabble); Hascombe (E. B. Bishop).  
*V. derelicta* Jord.—Ashtead (C. E. Salmon); Hascombe (E. B. Bishop); Reigate (E. Drabble).  
*V. contempta* Jord.—Leigh (C. E. Salmon); Shere (E. Drabble); Wisley (F. J. Chittenden).  
*V. Lloydii* Jord.—Byfleet, Peper Harrow (R. J. Burdon); Gomshall (C. E. Salmon); Wisley (F. J. Chittenden); Camberley, Woking.  
 var. *insignis* Drabble—Wisley (F. J. Chittenden).  
*V. Lejeunei* Jord.—Wisley (F. J. Chittenden); Claygate, Thames Ditton.  
*V. variata* Jord.—Chobham, Kingswood (E. Drabble); Gomshall, Norbury (C. E. Salmon).  
 var. *sulphurea* Drabble—Chobham, Guildford (E. Drabble); Gomshall (C. E. Salmon); Horsham, Pyrford (C. E. Britton); Wisley (F. J. Chittenden); Claygate, Shackleford, Thames Ditton, Thorpe, West Horsley, Woodham.  
*V. cantiana* Drabble—Brockham (1840).  
*V. monticola* Jord.—Gomshall (E. B. Bishop); Shackleford.  
*V. lepida* Jord.—Godalming (E. B. Bishop); Gomshall (C. E. Salmon),

## ESSEX (18, 19).

- V. agrestis* Jord.—Ansell (G. C. Druce); Saffron Walden (R. W. Butcher).  
*V. ruralis* Jord.—Blackheath near Colchester, Layer Marney (G. C. Brown).  
*V. anglica* Drabble—Layer Marney (G. C. Brown).  
*V. Lloydii* Jord.—Finchingfield.  
*V. Lejeunei* Jord.—Moreton (A. H. Wolley-Dod).  
*V. variata* Jord., var. *sulphurea* Drabble—Alphamstone (G. C. Brown).

## HERTFORDSHIRE (20).

- V. agrestis* Jord.—High Down, Welwyn (J. E. Little); Hertford.  
*V. segetalis* Jord.—Hitchin, Welwyn (J. E. Little).  
*V. ruralis* Jord.—Sarratt (C. E. Britton).  
*V. anglica* Drabble—Royston.  
*V. arvatica* Jord.—High Down (J. E. Little).  
*V. derelicta* Jord.—Little Wymondley (J. E. Little).  
*V. variata* Jord.—Albury (G. C. Druce); Great Wymondley (J. E. Little).  
 var. *sulphurea* Drabble—Albury (G. C. Druce); Great Wymondley (J. E. Little); Sarratt (C. E. Britton).

## MIDDLESEX (21).

- V. Déséglisei* Jord.—Golders Green (E. & H. Drabble); Hounslow.  
*V. arvatica* Jord.—West Drayton (W. R. Sherrin).  
*V. contempta* Jord.—Harefield (E. Drabble).  
*V. Lloydii* Jord., var. *insignis* Drabble—Mill Hill (E. & H. Drabble).  
*V. Lejeunei* Jord.—Harefield (E. Drabble); Greenford Green.

## BERKSHIRE (22).

- V. agrestis* Jord.—Newbury, Wash Common (W. Bell); Wokingham (H. W. Monckton).

- V. Déséglisei* Jord.—Bucklebury, Frilford (G. C. Druce).  
*V. segetalis* Jord., f. *obtusifolia* (Jord.)—Easthampstead Park (H. W. Monckton); Marcham, Moulsoford (G. C. Druce).  
*V. ruralis* Jord.—Boxford, Finchampstead, Frilford, Lambourne Valley, Wallingford (G. C. Druce).  
*V. contempta* Jord.—Frilford, Hurst Mill, Wallingford (G. C. Druce).  
*V. variata* Jord.—Frilford (G. C. Druce).  
 var. *sulphurea* Drabble—Bagshot, Boar's Hill, Boxford, Cothill, Tubney (G. C. Druce).  
*V. Lloydii* Jord.—Ambarrow (H. W. Monckton).

## OXFORDSHIRE (23).

- V. agrestis* Jord.—Oxford (R. W. Butcher).  
*V. Déséglisei* Jord.—Bix, Burford, Oxford (G. C. Druce); Wigginton (H. J. Riddelsdell).  
 f. *subtilis* (Jord.)—Burford Downs, Heyford, Oxford (G. C. Druce).  
*V. segetalis* Jord.—Burford, Nuneham, Osney, Oxford (G. C. Druce); Milton (H. J. Riddelsdell).  
 f. *obtusifolia* (Jord.)—Haseley, Oxford (G. C. Druce).  
*V. ruralis* Jord.—Chipping Norton, Coomb Wood, Cowley, Crowell, Gangsdown, Woodstock (G. C. Druce); Wigginton (H. J. Riddelsdell).  
*V. anglica* Drabble—Bladon, Woodstock (G. C. Druce); Wigginton (H. J. Riddelsdell).  
*V. arvatica* Jord.—Wigginton (H. J. Riddelsdell).  
*V. contempta* Jord.—Heyford, Gathampton (G. C. Druce); Goring (H. J. Riddelsdell).  
*V. Lloydii* Jord.—Hook Norton (1864).  
*V. variata* Jord.—Charlbury, Littlemore (G. C. Druce); Wigginton Heath (H. J. Riddelsdell).  
 var. *sulphurea* Drabble—Checkenden, Coomb Wood, Cowley, Headington, Littlemore, Oxford, Woodcote, Woodstock (G. C. Druce); Wigginton (H. J. Riddelsdell).

## BUCKINGHAMSHIRE (24).

- V. agrestis* Jord.—Chesham (E. Drabble).  
*V. Déséglisei* Jord.—Hanslope, Hodgemoor Wood, Lee (G. C. Druce).  
*V. segetalis* Jord.—Brickhill, Burnham, Denham, Seer Green (G. C. Druce).  
*V. ruralis* Jord.—Amersham, Akeley, Denham, Hampden, Oakley, Stokenchurch, Winslow, Wooburn Green (G. C. Druce); High Wycombe (J. Britten).  
*V. arvatica* Jord.—Amersham (E. & H. Drabble); Moreton Green, West Wycombe (G. C. Druce).  
*V. contempta* Jord.—Denham, Hampden, Haslemere, High Wycombe, Hodgemoor Wood, Lacey Green, Moreton Green, Seer Green, Slough (G. C. Druce).

- V. Lloydii* Jord.—Amersham (M. E. Page); Hanslope, Missenden (G. C. Druce).  
*V. variata* Jord.—Chesham Bois, Coles Hill, Wooburn (G. C. Druce).  
 var. *sulphurea* Drabble—Beaconsfield, Bradenham, Chalfont, Denham, Slough (G. C. Druce).  
*V. monticola* Jord.—High Wycombe (L. J. Tremayne).

## SUFFOLK (25, 26).

- V. agrestis* Jord.—Bury St Edmunds (G. C. Druce).  
*V. Déséglisei* Jord.—Kirkley.  
*V. segetalis* Jord.—Gorleston (A. E. Cook).  
 f. *obtusifolia* (Jord.)—Raydon (G. C. Brown).  
*V. ruralis* Jord.—Cavenham (E. S. Marshall); Raydon, Shelley (G. C. Brown).  
*V. anglica* Drabble—Icklingham (R. W. Butcher).  
*V. variata* Jord.—Higham, Tuddenham (R. W. Butcher).  
*V. lutea* Huds., f. *Pesneavi* Lloyd & Foucaud—Barham St Gregory, Brandon, Sutton Common (G. C. Brown); Thetford Heath (W. C. F. Newton).

## NORFOLK (27, 28).

- V. Déséglisei* Jord.—Stow (G. C. Druce).  
*V. ruralis* Jord.—Sprowston (E. F. Linton); Wraxham (M. Pallis).  
*V. arcatica* Jord.—North Walsham (K. Norrington).  
*V. anglica* Drabble—Wraxham (M. Pallis).  
*V. variata* Jord., var. *sulphurea* Drabble—Foulsham (W. L. Notcutt); Framlingham.  
*V. lepida* Jord.—Thetford (R. W. Butcher).  
*V. lutea* Huds., f. *Pesneavi* Lloyd & Foucaud—Croxtton (F. Robinson); Santon Warren (J. E. Little).

## CAMBRIDGESHIRE (29).

- V. agrestis* Jord.—Gamlingay (C. E. Moss); Fordham.  
*V. segetalis* Jord.—Fordham, Harston.  
*V. ruralis* Jord.—Cambridge (C. E. Moss).  
*V. latifolia* Drabble—Gamlingay.  
*V. anglica* Drabble—Babraham, Cherry Hinton (R. W. Butcher); Newmarket.  
*V. variata* Jord.—Chippenham, Newmarket (G. C. Druce).

## BEDFORDSHIRE (30).

- V. ruralis* Jord.—Wooton (G. C. Druce).  
*V. variata* Jord., var. *sulphurea* Drabble—Luton (C. E. Britton).

## HUNTINGDONSHIRE (31).

- V. agrestis* Jord.—Woodwalton Fen (E. W. Hunnybun).  
*V. Déséglisei* Jord.—Stibbington (G. C. Druce).  
*V. ruralis* Jord.—Orton (G. C. Druce).  
*V. contempta* Jord.—Holme (G. C. Druce).

## NORTHAMPTONSHIRE (32).

- V. Déséglisei* Jord.—Long Marston.  
*V. ruralis* Jord.—Ashton, Barnack, Cosgrove, Harleston (G. C. Druce).  
*V. arvatica* Jord.—Eye (G. C. Druce).  
*V. Lejeunei* Jord.—Middleton (G. C. Druce).  
*V. variata* Jord., var. *sulphurea* Drabble—Barnack (G. C. Druce).

## GLOUCESTERSHIRE (33, 34).

- V. agrestis* Jord.—Ashton Gate, Cirencester, Kempsford, Lydney (H. J. Riddelsdell); Gloucester, Southrop.  
*V. Déséglisei* Jord.—Chatcombe, Cirencester, Cranham, Ford (H. J. Riddelsdell).  
     f. *subtilis* (Jord.)—Fostons Ash.  
*V. segetalis* Jord.—Ford (H. J. Riddelsdell).  
*V. ruralis* Jord.—Bisley (S. Gibson); Cheltenham (W. I. Notcutt); Stroud.  
*V. arvatica* Jord.—Cirencester, Welford (H. J. Riddelsdell).  
*V. derelicta* Jord.—Cranham Common (H. J. Riddelsdell).  
*V. contempta* Jord.—Coates, Newent.  
*V. variata* Jord., var. *sulphurea* Drabble—Colesbourne, Kempsfield, Sapperton (H. J. Riddelsdell); Tockington (I. M. Roper); Frampton Mansell.  
*V. cantiana* Drabble—Cirencester.

## MONMOUTHSHIRE (35).

- V. Déséglisei* Jord.—Llantony.  
*V. ruralis* Jord.—Castleton, Ilton.  
*V. variata* Jord., var. *sulphurea* Drabble—Castleton.

## HEREFORDSHIRE (36).

- V. arvatica* Jord.—Ross (W. R. Sherrin); Sellack (A. Ley).  
*V. Lloydii* Jord.—Brilley (S. H. Bickham).  
*V. Lejeunei* Jord.—Brilley (A. Ley).  
*V. variata* Jord., var. *sulphurea* Drabble—Hope Mansell, Ross (A. Ley).  
*V. lepida* Jord.—Cowley Pool (A. Ley); St Weonards.  
*V. lutea* Huds.—How Caple (A. Ley).

## WORCESTERSHIRE (37).

- V. arvatica* Jord.—Bredon Hill (R. Saunders).  
*V. latifolia* Drabble—Worcester (I. E. Allen).  
*V. contempta* Jord.—Great Malvern, Welland (R. F. Towndrow).  
*V. lutea* Huds., f. *Pesneavi* Lloyd & Foucaud—Churchill (C. Rea).

## WARWICKSHIRE (38).

- V. segetalis* Jord., f. *obtusifolia* (Jord.)—Kenilworth (J. A. Wheldon).  
*V. ruralis* Jord.—Kingsbury, Lighthorne (C. E. Palmer); Myton.  
*V. latifolia* Drabble—Kenilworth (J. A. Wheldon).  
*V. variata* Jord., var. *sulphurea* Drabble—Myton.

## STAFFORDSHIRE (39).

- V. Déséglisei* Jord.—Burton-on-Trent, Stafford.  
*V. ruralis* Jord.—Biddulph, Lichfield (G. C. Druce).  
*V. Lloydii* Jord.—Leek (M. E. Page).  
*V. alpestris* Jord.—Ecton (W. H. Purchas).

## SHROPSHIRE (40).

- V. Déséglisei* Jord.—Sharpstones Hill (J. C. Melvill).  
     *f. subtilis* (Jord.)—Sharpstones Hill (J. C. Melvill).  
*V. ruralis* Jord.—Shrewsbury (1834).  
*V. Lloydii* Jord.—Grinshill (H. A. Jones).  
*V. lepida* Jord.—Ironbridge (A. Bennett); Ivybridge, Neach Hill,  
     Wroxeter.  
*V. lutea* Huds.—Caradoc (H. A. Jones); Oswestry, Stiperstones.

## GLAMORGANSHIRE (41).

- V. agrestis* Jord.—Hendrefoilan, Llandaff, Llwydcoed (H. J. Riddelsdell).  
*V. Déséglisei* Jord.—Aberdare, Llantwyt Major, Llwydcoed (H. J. Riddelsdell); Penarth Ferry (A. E. Wade).  
*V. segetalis* Jord.—Aberdare, Llandaff (H. J. Riddelsdell).  
     *f. obtusifolia* (Jord.)—Llwydcoed (H. J. Riddelsdell).  
*V. ruralis* Jord.—Llwydcoed (H. J. Riddelsdell).  
*V. arvensis* Jord.—Porthcawl, Radyr (H. J. Riddelsdell).  
*V. Lloydii* Jord.—Llandaff, Llwydcoed (H. J. Riddelsdell).  
*V. variata* Jord.—Abernant (H. J. Riddelsdell).  
*V. lutea* Huds.—Aberdare, Craig Koynoch.  
     *f. Curtisii* Forster—Breton Ferry, Crymlyn Burrows, Whitford  
     Burrows (E. F. Linton); Kenfig Burrows, Merthyr Major War-  
     ren, Port Talbot Burrows (E. S. Marshall).

## BRECKNOCKSHIRE (42).

- V. segetalis* Jord.—Llangammarch (A. Ley).  
*V. Lloydii* Jord.—Three Cocks Junction.  
     *var. insignis* Drabble—Llangammarch (A. Ley).  
*V. Lejeunei* Jord.—Llangammarch (A. Ley).

## RADNORSHIRE (43).

- V. Lejeunei* Jord.—Knighton (A. H. Wolley-Dod).  
*V. variata* Jord.—Cregrina.  
*V. lepida* Jord.—Knighton (A. H. Wolley-Dod); Aberdare.  
*V. lutea* Huds.—Llandrindod (C. Bailey); Reeves Hill.

## CARMARTHENSHIRE (44).

- V. Lloydii* Jord.—Carmarthen.  
*V. lutea* Huds., *f. Curtisii* Forster—Kidwelly Burrows (H. L. Jones);  
     Pembey Burrows (E. S. Marshall); Pendine (A. Wallace); Ferry  
     Side.

## PEMBROKESHIRE (45).

- V. agrestis* Jord.—Tenby (S. H. Bickham).  
*V. Déséglisei* Jord.—St David's (E. F. Linton).  
*V. segetalis* Jord.—St David's (E. F. Linton).  
*V. contempta* Jord.—Proud Giltar, Tenby (S. H. Bickham).  
*V. Lejeunei* Jord.—St David's (E. F. Linton).  
*V. lutea* Huds.—St David's (E. F. Linton).

## CARDIGANSHIRE (46).

- V. lepida* Jord.—Aberystwyth (A. E. Cook); Lampeter (H. J. Riddelsdell).  
*V. lutea* Huds.—Bethania, Bwlch Mountain, Tregaron, Ysppyty Cynfyn.

## MONTGOMERYSHIRE (47).

- V. lutea* Huds.—Gregynog, Llanidloes (R. J. N. Streeter); Plynlimmon.

## MERIONETHSHIRE (48).

- V. segetalis* Jord.—Dolgelly (W. C. Barton).  
*V. Lejeunei* Jord.—Tyn-y-Groes.  
*V. lutea* Huds.—Bala (H. S. Foster); Ilroy (H. Groves); Penmachno (A. Ley); Aberdovey, Corwen, Dolgelly.  
 f. *calaminaria* Lejeune—Towyn.  
 f. *Curtisii* (Forster). (*Forsteri* H. C. Wats.)—Barmouth (C. Bailey); Llanaber (G. Goode).  
 f. *Pesneau* Lloyd & Foucaud—Harlech, Mochras (D. A. Jones); Pensarn (G. A. Bishop).

## CARNARVONSHIRE (49).

- V. lutea* Huds.—Bangor (E. S. Gregory); Devil's Bridge (Mrs Henley).

## DENBIGHSHIRE (50).

- V. Lejeunei* Jord.—Chirk.  
*V. lepida* Jord.—Hafod (I. M. Roper).  
*V. lutea* Huds.—Llanrwst.

## FLINTSHIRE (51).

- V. contempta* Jord.—Cwm (J. A. Wheldon).  
*V. variata* Jord.—Holywell (J. Comber).  
*V. lutea* Huds.—Cwm Mountain (J. Comber).

## ANGLESEA (52).

- V. segetalis* Jord.—Beaumaris.  
*V. Lloydii* Jord.—Anglesea (no locality, J. E. Griffith).  
*V. lutea* Huds., f. *Curtisii* (Forster)—Aberffraw, Bodafon, Holyhead, Penrhos (C. Bailey); Llyn Coron (S. H. Bickham); Newborough (E. S. Todd); Maelog Lake, Meldraeth Sands.

## LINCOLNSHIRE (53, 54).

- V. latifolia* Drabble—Cleethorpes (E. & H. Drabble).

## LEICESTERSHIRE (with RUTLAND) (55).

- V. agrestis* Jord.—Ayleston, Kebworth Beauchamp, Knighton Grange, Narborough, Swithland, Syston (A. R. Horwood).  
*V. Déséglisei* Jord.—Billesdon, Branston, Casterton, Kilby, Lubbesthorpe, Lutterworth, Morcott, Shepshed, Syston, Tilton Hill (A. R. Horwood); Knighton (W. Bell); Worthington (M. E. Page).  
 f. *subtilis* (Jord.)—Goadby Marwood, Saltby (A. R. Horwood).  
*V. segetalis* Jord.—Lutterworth (W. Bell).  
 f. *obtusifolia* (Jord.)—Aylestone, Groby (A. R. Horwood); Knighton, Leicester, Leicester Forest East (W. Bell); Mowsley, Potter's Marston (A. E. Wade).  
*V. ruralis* Jord.—Normanton (A. R. Horwood).  
*V. latifolia* Drabble—Cadeby, Kilby, Narborough, Oadby, Thurlaston (A. R. Horwood); Rothley Plain (W. Bell).  
*V. anglica* Drabble—Harby Hills (A. R. Horwood).  
*V. arvatica* Jord.—Cadeby, Goadby Marwood, Knipton (A. R. Horwood); Knighton, South Knighton, Oadby (W. Bell).  
*V. derelicta* Jord.—Newtown Linford (W. Bell).  
*V. contempta* Jord.—Normanton (A. R. Horwood).  
*V. Lloydii* Jord., var. *insignis* Drabble—Leicester, Sibstone (W. Bell).  
*V. Lejeunei* Jord.—Leicester, Wigston (W. Bell).  
*V. variata* Jord.—Higham (A. R. Horwood).  
 var. *sulphurea* Drabble—Narborough Bog, Normanton (A. R. Horwood).

## NOTTINGHAMSHIRE (56).

- V. segetalis* Jord.—Misson (E. & H. Drabble).  
 f. *obtusifolia* (Jord.)—Strelley (W. Norbury).  
*V. Lloydii* Jord., var. *insignis* Drabble—Strelley (W. Norbury).  
*V. Lejeunei* Jord.—Misson (E. & H. Drabble).  
*V. lepida* Jord.—Everton, Misson (E. & H. Drabble).

## DERBYSHIRE (57).

- V. agrestis* Jord.—Barlow, Boythorpe, Hasland, Linacre, Tapton, Upper Loads (E. & H. Drabble).  
*V. Déséglisei* Jord.—Ashover Hay, Boythorpe, Cathole, Cromford, Freebirch (E. & H. Drabble).  
 f. *subtilis* (Jord.)—Clowne (E. & H. Drabble).  
*V. segetalis* Jord.—Brampton, Bretton, Eyam, Linacre, Norton Leas (E. & H. Drabble).  
 f. *obtusifolia* (Jord.)—Bakewell, Brampton, Chesterfield, Duckmanton, Grindleford, Spital, Walton (E. & H. Drabble).  
*V. ruralis* Jord.—Wingerworth (E. & H. Drabble); Repton, Stapenhill (W. R. Linton).  
*V. latifolia* Drabble—Barlow (E. & H. Drabble).  
*V. arvatica* Jord.—Barlow, Boythorpe (E. & H. Drabble).  
*V. derelicta* Jord.—Linacre (E. & H. Drabble).  
*V. contempta* Jord.—Chesterfield, Elmtun, Eyam (E. & H. Drabble).  
*V. Lloydii* Jord.—Cowley Bar, Eyam, Linacre (E. & H. Drabble).

- V. Lejeunei* Jord.—Eyam, Linacre, Norton (E. & H. Drabble).  
*V. lepida* Jord.—Cromford, Eyam, Freebirch, Linacre (E. & H. Drabble); Wirksworth (W. R. Linton).  
*V. lutea* Huds.—Ashover, Black Rocks, Blackwall, Bonsall, Bretton, Buxton, Castleton, Coombes Moss, Cromford, Eyam, Matlock, Middleton-by-Youlgreave, Miller's Dale, Sheldon, Wardlow Hay Cop, Wirksworth (E. & H. Drabble).  
 f. *polychroma* (Kerner)—Eyam (E. & H. Drabble).  
 f. *calaminaria* (Lejeune)—Sheldon, Wadshelf.

## CHESHIRE (58).

- V. agrestis* Jord.—Malpas (A. H. Wolley-Dod); Whitby, Wallasey (E. & H. Drabble).  
*V. Déséglisei* (Jord).—Tilston (A. H. Wolley-Dod).  
*V. segetalis* Jord.—Bromborough (J. W. Burton); Chester (C. Waterfall); Malpas (A. H. Wolley-Dod).  
 f. *obtusifolia* (Jord.)—Bidston, New Brighton, Wallasey (E. & H. Drabble).  
*V. ruralis* Jord.—Ashley, Lindon Common (C. Bailey); Bidston, Burton Point, New Brighton, Wallasey (E. & H. Drabble).  
*V. latifolia* Drabble—Wallasey (E. & H. Drabble).  
*V. anglica* Drabble—Wallasey (E. & H. Drabble).  
*V. arvatia* Jord.—(E. & H. Drabble).  
*V. contempta* Jord.—Burton Point (E. & H. Drabble); Malpas (A. H. Wolley-Dod).  
*V. Lloydii* Jord.—Bowdon (S. H. Bickham); Wallasey (E. & H. Drabble); Mobberley.  
*V. variata* Jord.—Arlington, Wilmsford (C. Bailey); Bidston (E. & H. Drabble); Bowdon (S. H. Bickham).  
 var. *sulphurea* Drabble—Oxton, Wallasey (E. & H. Drabble).  
*V. lutea* Huds., f. *Curtisii* (Forster). (*Forsteri* H. C. Wats.)—New Brighton (F. M. Webb, 1862); Wallasey (J. H. Lewis, 1873). These are the dates of the latest gatherings I have seen. The plant is now extinct in both localities.

## LANCASHIRE (59, 60, 69 in part).

- V. agrestis* Jord.—Dalton (D. Lumb); Formby, Hightown (E. & H. Drabble); Rainford Moss (W. G. Travis); Walton (J. A. Wheldon); Ulverston.  
*V. Déséglisei* Jord.—Cockerham Moss, Rainford Moss (J. A. Wheldon); Hightown (E. & H. Drabble); Wreaks Bridge, Urswick (W. H. Pearsall).  
 f. *subtilis* Jord.—Cockerham Moss, Simmonswood (J. A. Wheldon); Causeway End.  
*V. segetalis* Jord.—Cockerham Moss, Lytham, Mossley (J. A. Wheldon); Dalton (D. Lumb); St Annes, Southport, Withington (C. Bailey); Sawrey (W. H. Pearsall).

- f. obtusifolia* (Jord.)—Cockerham, Lytham, Walton (J. A. Wheldon); Ince Blundell (E. & H. Drabble).
- V. ruralis* Jord.—Askham, Dalton (D. Lumb); Formby, Hightown, Ince Blundell (E. & H. Drabble); Kent's Bank (W. H. Pearsall); Silverdale (J. Cryer); Southport (C. Bailey); Walton (J. A. Wheldon); Plumpton.
- V. latifolia* Drabble—Lytham (E. Drabble); Manchester (C. Bailey).
- V. anglica* Drabble—Dalton, Kent's Bank (W. H. Pearsall); Hall Road, Hightown (E. & H. Drabble); Silverdale.
- V. arvatica* Jord.—Broughton-in-Furness, Sawrey (W. H. Pearsall); Hightown (E. & H. Drabble); Silverdale.
- V. Lloydii* Jord.—Carnforth, Cockerham, Newton-le-Willows, Rainford Moss, Simmonswood (J. A. Wheldon); Crooklands (D. Lumb); Whiston (Fr. Toohey).
- var. *insignis* Drabble—Rainford Moss (J. A. Wheldon).
- V. Lejeunei* Jord.—Billinge, Brathay (J. A. Wheldon); Dalton, Deer Dyke Moss (W. H. Pearsall); Foxfield (D. Lumb).
- V. variata* Jord.—Foxfield (D. Lumb); Prestwich, Rainford, Simmonswood, Warton Crag (J. A. Wheldon); Stribers Moss (W. H. Pearsall); Whiston (Fr. Toohey).
- var. *sulphurea* Drabble—Stribers Moss (W. H. Pearsall); Netherton.
- V. alpestris* Jord.—Brathay (J. Comber); Stribers Moss (W. H. Pearsall).
- V. monticola* Jord.—Ormskirk (W. G. Travis).
- V. lepida* Jord.—Brathay (J. Comber); Broughton-in-Furness, Haverthwaite, Stribers Moss (W. H. Pearsall); Carnforth, Leck, Nateby, Pilling, Simmonswood, Woolston Moss (J. A. Wheldon).
- f. carpatica* (Borbás)—Cockerham Moss, Pilling (J. A. Wheldon); Haverthwaite (W. H. Pearsall); Thrang Moss (A. Wilson).
- V. lutea* Huds., *f. Curtisii* (Forster). (*Forsteri* H. C. Wats.)—Ansdell (E. Drabble); Fairhaven (C. Bailey); Landscale (D. Lumb).
- f. Pesmeaui* Lloyd & Foucaud—Ansdell, Birkdale, Lytham, St Annes, Southport (E. Drabble); Askham, Sandscale (D. Lumb); Blackpool, Fairhaven (C. Bailey); Walney Island (J. Comber).

## YORKSHIRE (61, 62, 63, 64, 65).

- V. Déséglisei* Jord.—Thirsk (J. G. Baker).
- V. segetalis* Jord.—Adel (J. Cryer); Sowerby (J. G. Baker); Strensall.
- f. obtusifolia* (Jord.)—Baildon (M. E. Page); Thirsk (J. G. Baker).
- V. ruralis* Jord.—Sowerby, Thirsk (J. G. Baker).
- V. contempta* Jord.—Thirsk (J. G. Baker).
- V. Lloydii* Jord.—Baildon (M. E. Page); Bingley, Shipley (J. Cryer); Nunthorpe (W. J. Fordham); Thirsk (J. G. Baker); Askern.
- var. *insignis* Drabble—Bingley (J. Cryer).
- V. Lejeunei* Jord.—Adel (J. Cryer); Nunthorpe (W. J. Fordham); Thirsk (J. G. Baker).
- V. lepida* Jord.—Bawtry (E. & H. Drabble); Huddersfield (T. W. B. Ingle); Malham Cove (A. E. Lomax); Scrampton Hall (G. C. Druce); Newton-in-Bowland.

- V. lutea* Huds. (including f. *amoena* Henslow)—Halifax, 1843 (S. King); Hawes, Settle, Widy Bank (J. A. Wheldon); Kepwick, Kettlewell, Langreth, Micklem, Middleton-in-Teesdale (W. S. Fordham); Lytton (C. Waterfall); Malham (J. Cryer); Pateley Bridge (T. N. Ferrier); Upper Cronkley Bridge (J. G. Baker).

## DURHAM (66).

- V. agrestis* (Jord).—Whitburn.  
*V. ruralis* Jord.—Ballard Down.  
*V. variata* Jord.—Butterby, Gibside Hill.  
*V. lutea* Huds. (including f. *amoena* Henslow)—Bishop Auckland (J. P. Souther); High Force (T. Gibbs); Upper Teesdale (E. S. Marshall); Butterby, Darlington.

## NORTHUMBERLAND (67, 68).

- V. variata* Jord.—Ryton, Wyland.  
*V. monticola* Jord.—Doddington (I. M. Hayward).  
*V. lutea* Huds. (including f. *amoena* Henslow)—Barton Mill (C. Bailey); Carter Fell, Cheviot, Plankey Allen, Throckrington Quarry.

## WESTMORLAND (69).

- V. Lèjeunei* Jord.—Ambleside (H. Fisher, 1866).  
*V. variata* Jord.—Rydal.  
*V. lepida* Jord.—Ambleside (N. Haffenden); Little Langvale, Troutbeck.  
*V. lutea* Huds.—Dollywagon, Keswick (E. & H. Drabble); Ravenstone Dale, Shap.

## CUMBERLAND (70).

- V. agrestis* Jord.—Duddon Bridge, Low Boghouse (W. H. Pearsall).  
*V. Déséglisei* Jord.—Skinburness.  
     f. *subtilis* (Jord.)—Wythburn (E. & H. Drabble).  
*V. segetalis* Jord.—Hall Thwaites (W. H. Pearsall).  
     f. *obtusifolia* (Jord.)—Hall Thwaites (W. H. Pearsall).  
*V. contempta* Jord.—Wythburn (E. & H. Drabble).  
*V. Lloydii* Jord.—Drigg (A. Wallis).  
*V. variata* Jord.—Brampton, Watermillock (G. C. Druce).  
*V. lepida* Jord.—Duddon Hall, Elf Hall (W. H. Pearsall); Great Langdale, Penrith (C. Bailey).  
*V. lutea* Huds. (including f. *amoena* Henslow)—Alston, Catterpallot near Melmerby (C. Waterfall); Great Salkeld (C. E. Salmon); Melbreak (J. Comber); Thirlmere (E. & H. Drabble); Skiddaw.  
     f. *Pesneavi* Lloyd & Foucaud—Drigg (A. Wallis).

## ISLE OF MAN (71).

- V. segetalis* Jord.—Laxey, Ramsey (C. H. Waddell).  
*V. arvatica* Jord.—Ramsey (C. H. Waddell).  
*V. lutea* Huds., var. *Curtisii* (Forster). (*Forsteri* H. C. Wats.)—Ballagh (J. S. Rouse).

## PERSONALIA AND VARIOUS NOTES.

MR R. M. ADAM, deputising for Professor Drummond, lectured before the Royal Caledonian Horticultural Society on "The Vegetation of Ben Lawers." He said that although it only ranks as fiftieth in the order of height among British mountains it surpasses all others in its wealth of species. Out of the 1024 recorded Scottish plants some 500 could be gathered on or in the vicinity of that mountain. He stated that on the higher levels a society of plants was to be found which must be regarded as constituting a mere remnant of a former flora which dominated the entire kingdom. This was an arctic flora which, in a war waged between arctic and southern types, was beaten by the climate, and its scope became less. The diminishing arctic species have gradually retreated to those regions where only the most hardy and resistant can survive. This process is going on to-day, and Ben Lawers may be regarded as one of the last citadels of those much harassed plants. The statements he made are somewhat dogmatic although, perhaps, in the main correct, but they do not entirely explain why Ben Lawers is so unusually rich. Our readers should consult Patton's papers (*Rep. B.F.C.*, 797, 1922, and 268, 1923), on the Flora of Ben Lawers and Ben Laoigh.

MR L. H. BAILEY, the well-known writer and compiler of the *Cyclopedia of Horticulture*, has been chosen president of the American Society for the Advancement of Science. It has a membership roll of 15,000.

SIR I. B. BALFOUR. A memorial to his memory was unveiled in Edinburgh Botanical Gardens by Sir Herbert Maxwell, Bart., on September 28th. It bears this inscription:—"This stone commemorates Sir Isaac Bayley Balfour, Keeper of these Gardens, 1888-1922, and is set here by his colleagues and friends to reward the zeal with which he worked, and the affection which they bore him." The main memorial, however, is to be at Ben More, Argyllshire, on the east side of the road leading from Dunoon to Loch Eck. The area is already planted with numerous exotic trees.

MR W. DALLIMORE, the well-known writer on Coniferae, has been made Curator of the Museum at the Royal Botanic Gardens, Kew.

SIR DANIEL HALL, K.C.B., F.R.S., has been appointed to succeed Prof. W. Bateson as Director of the John Innes Horticultural Institute at Merton. See notice with portrait in *Gard Chron.* ii., 122, 1926.

SIR GEORGE HIGGINSON of Marlow. The town has purchased a frontage on the Thames known as Court Garden, for a Public Park, on the occasion of Sir George's hundredth birthday. It will be known as Higginson Park. Towards the purchase he gave the money presented to him on that occasion.

MR WILLIAM INGHAM's collection of British mosses has been presented to the Department of Botany of Leeds University. Mr W. H. Burrell, 44 West View, Horsforth, Leeds, is acting as Honorary Curator, and will gladly receive additions.

DR B. DAYDON JACKSON. His portrait, by Mr Edward Moore, was presented to him on May 27th by the Fellows of the Linnean Society and friends. Sir David Prain, in unveiling it, said he had been Botanical Secretary from 1880-1892, and General Secretary up to 1926, when he was appointed Curator of the Linnean Collections. Dr Daydon Jackson deserves all honour for his monumental work on the "Kew Index," while his "Glossary of Botanic Terms," and his "Guide to the Literature of Botany," have been most helpful works. His ready kindness is a household word.

COL. H. HALCRO JOHNSTON. Our valued member has arranged the Herbarium formed by Mr Magnus Spence, which illustrates that author's "Flora Orcadensis," which was published in 1914, and enumerated 572 species. 406 of these are represented in the Herbarium, and a few others which are new records. They are mounted on 797 sheets. The plants were gifted to the Natural History Society. They are now enclosed in a solid Austrian Oak Cabinet, which was given by Col. Johnston and his family in memory of their father. The presentation took place in July 1926. Colonel Johnston's Herbarium of Orkney plants is probably the best in existence of a small area, as the specimens are meticulously prepared and illustrated by numerous examples. They are preserved in Austrian Oak air-tight cabinets. Recently he has added many new species of Dandelion to the Orkney Flora.

PROF. J. PERCIVAL, The University, Reading, is issuing "A Collection of the Chief Wheats of the World." It includes more than 1300 single-line forms mounted on stout sheets, 36 cm. x 28 cm., and is contained in 15 cases. Price £100.

JOHN TRADESCANT. Owing to the generosity of the members of the Garden Club of Virginia, a window bearing the arms of Tradescant surmounted by a wreath of *Tradescantia* was unveiled by Lord Fairfax in November last. The window is in the old Ashmolean Museum, Oxford, which was designed by Sir Christopher Wren. The contents of Tradescant's Museum were housed there in 1683, after they were presented to Oxford by Elias Ashmole. Robert Plot, author of "The Natural History of Oxfordshire," was its first keeper.

PROFESSOR A. S. WATSON, as Sibthorpean Professor of Rural Economy, has been elected to Fellowship of St John's College, Oxford.

MR T. BARLOW WOOD, C.B.E., is now Professor of Agriculture at Cambridge.

BLAKENEY POINT, under the National Trust Report 1924-1926, by F. W. Oliver. This gives some most useful details and excellent photographs. On a portion of the reserve certain species have been planted such as *Salix daphnoides*, *Weigelia*, &c. A Library is being formed. Mr Robert Gurney succeeds Mr A. W. Cozens-Hardy as Chairman.

HASLEMERE MUSEUM. The opening of the new Museum took place last September. Sir Jonathan Hutchinson founded it as an educational museum, and he was fortunate in obtaining as Curator our member, Mr G. W. Swainton, A.L.S., the authority on galls. Since 1913 this Museum has been kept going by voluntary subscribers at the cost of about £500 a year. Now a more central site has been found, and as a memorial to Sir Jonathan Hutchinson, the house known as The Lodge was acquired and adapted for the purpose. In 1925 the Museum was enriched by the munificent gift, from the Trustees, of the Peasant Arts Museum and its contents, which had been formed by the Rev. G. S. Davies, Master of the Charterhouse, the Trustees also giving a donation of £1000 towards the building fund. In future its upkeep will need £750 annually. The new building was opened by the Earl of Middleton, and the Warden of New College. Rt. Hon. H. A. L. Fisher proposed a vote of thanks to him and to Dr Bather for their interesting addresses.

KEN WOOD. Through the generosity of Lord Iveagh, 70 acres and the Mansion will become public property in ten years' time.

CITY OF LEEDS Tercentenary Celebrations, July 8-23, 1926. Handbook to the Old Leeds Exhibition, pp. 277, with many illustrations, including that of the Charter, dated 1661. Gardham, Brunswick Works, Leeds. 459 portraits were exhibited, of which many are figured. There was a good selection of Leeds Pottery. There were no Botanical exhibits. An account is given of the Quarries of Leeds, and a large number of Yorkshire stones from quarries in the neighbourhood were shown by W. Irwin, jun., and F. W. Branson.

CITY OF LEICESTER. The Museum and Art Gallery Report (No. 22), 1925-26. One member, Mr G. J. V. Bemrose, has been indefatigable in maintaining a fresh wild-flower show. This has been a popular and instructive exhibit. Nearly £5000 has come from the rates for the maintenance of the Institution. Nearly a quarter of a million visitors have taken advantage of the Museum, the Sunday visitors reaching the number of 92,030.

SHREWSBURY CASTLE has been presented to the town by the local Horticultural Society. It was erected in the time of Edward I.

"THE WYKEHAMIST." From the Wykehamist of July 14, 1926, we notice that Mr Quirk has addressed the Hybrid Orchid which was found on the Winton Down, Winchester. See *Rep. B.E.C.* 508, 1910; 33, 1911 (where it appears as  $\times$  *Habenaria Jacksonii*), and 158, 1917.

## FLOS FLORUM.

Jacksoniensis occidit Platanthera,  
 Quae nata quondam montibus decus nostris  
 inusitata crevit atque inaudita,  
 monstrum biforme, sanguinis genus mixti,  
 nunc trita plantis insolentibus nulla est.

At vos, abite, pessimi viatores,  
 alioque tendite, in malam crucem, gressus,  
 per quos ocellus periit omnium florum,  
 Jacksonii pulchella Gymplatanthera.

R. Q.

“NOTE.—The hybrid orchid found by Mr Jackson in 1910 appears to have died out. The plant, a cross between the genera *Gymnadenia* and *Platanthera*, was new to botany: Kew saw their chance, and named it *Gymplatanthera Jacksonii*.”

THE REV. W. KEBLE MARTIN, Coffinswell Rectory, Newton Abbot, is painting British Plants and would be glad if members would send him fresh specimens.

MR F. J. HANBURY, Brockhurst, East Grinstead, is anxious to have seeds of rare British plants. He will defray expenses.

MR A. E. WADE, Botanical Department, the University of Cardiff, is contemplating the preparation of a Flora of Monmouthshire, and would be glad of assistance.

MRS ISABEL ADAMS, F.L.S., is painting British Aquatics. Members wishing to help in collecting specimens are asked to communicate with her at 14 Vernon Road, Edgbaston.

MRS PERRIN, 23 Holland Villas Road, London, W. 14, is continuing her beautiful paintings of British plants. Members willing to assist in collecting specimens are asked to write to the above address.

MR H. BRITTEN, 42 Millfield Road, York, is preparing a Flora of Cumberland, and would be glad of any records or notes.

MR T. A. DYMES, F.L.S., Carthona, West Drayton, Middlesex, wants ripe capsules of British Orchids, especially *Malaxis*, *Herminium*, *Cephalanthera*, *Spiranthes*, &c.

MR C. G. TRAPNELL, 6 Beaufort Road, Clifton, Bristol, would be grateful for the loan of a paper on “The Rubi of Den Edale” by the Rev. W. Moyle Rogers.

PROF. J. M. DRUMMOND gave four lectures at Glasgow on Town Botany in Winter, in the Botany Department of the University, dealing first with seeds and seedlings.

DR G. CLARIDGE DRUCE, the Hon. Secretary, begs to thank most warmly those who have so generously and kindly sent their congratulations to him on receiving the high honour of the Fellowship of the Royal Society, and to assure them that he greatly appreciates their good wishes.

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DENT DE LION.

(Lines addressed to Dr G. C. Druce, who has recently discovered two new species of Dandelion in Oxfordshire.)

Hail! Champion of the Floral race,  
 So kindly rooted in this place,  
 By Fate who planted thee.  
 Arrayed in Aldermanic gown,  
 Surmounted by the laurel crown  
 Of Oxford's D.Sc.

Alas! for those whose lack of skill—  
 Or of "grey matter," if you will—  
 Has left them much to learn.  
 Between the golden blossoms gay,  
 Of dandelion fields in May,  
 No difference they discern.

A dandelion on the lea  
 A "dandelion" is to me,  
 And it is nothing more.  
 When making dandelion tea,  
 Its caustic flavour seems to be  
 Just what it was before.

But to thy trained botanic eye,  
 Each plant that blooms beneath the sky  
 Its story has to tell.  
 And two new species take their place,  
 Which former students failed to trace  
 In Oxford field or dell.

So now our glasses we'll combine  
 To fill with dandelion wine  
 And toast thy onward way.  
 May Time enrich thy fruitful mind  
 With health and happiness to find  
 New species every day.

REGINALD A. R. BENNETT in "Oxford Times," March 18, 1926.

## ADDENDA TO PLANT NOTES.

247. *LEPIDIUM LINOIDES* Thunb., var. *SUBDENTATUM* (Burch.). Alien, S. Africa. Galashiels, Selkirk, 1926, Miss I. M. HAYWARD. Det. by Dr THELLUNG as *L. divaricatum* Soland., sub-sp. *linoides* (Thunb.) Thell., var. *subdentatum* (Burch.) Thell.

331. *SAPONARIA VACCARIA* L., var. *GRANDIFLORA* Fisch. Alien, Orient. Par, Cornwall, W. TRESIDDER. Det., as *Vaccaria pyramidata* Med., var. *grandiflora* (Fisch.) Celak.

419. *GERANIUM CORE-CORE* Steudel. Alien, Argentina and Chile. Near L'Hermitage, Guernsey, in a lane, Lady DAVY, Mrs KNOWLING, Miss VACHELL & Miss VIVIAN, 1926. Det., with some doubt, by Dr THELLUNG, the specimen being incomplete.

†745. *SPIRAEA Van Houttei* (Brist.) Zabel. S. *CANTONIENSIS* Lour. (China, Japan) × *S. TRILOBA* (L.) Sib. Alien, Hortal. Ballumbie Den, Forfar, 1920, R. & M. CORSTORPHINE. Det. A. THELLUNG.

943. *ROSA MOLLIS* × *PIMPINELLIFOLIA*. Dr Heslop-Harrison (*in litt.*) believes *Rosa rubella* to be a back cross—*mollis* with the red fruit behaving as a Mendelian dominant.

1070. *OENOTHERA ARGENTINA* Lévl. et Thell., var. *LONGIPILA* Kloos et Thell. in Nederl. Kruidk. Archief. 100, (1921) 1922. Alien, S. America. Dagenham, Essex, 1926, R. MELVILLE. Det. Dr THELLUNG.

1147. *ANGELICA SYLVESTRIS* L., var. vel forma *INCISA* Reichb. Near Minehead, Somerset, C. AMHERST. Det. Dr THELLUNG.

1153. *HERACLEUM MANEGAZZIANUM* Somm. & Levier in Nuov. Giorn. Bot. Ital. ii., 73, 1895. Alien, Caucasus. Ware, Herts, 1920, G. C. DRUCE. Det. Dr THELLUNG. Probably *H. giganteum* of English authors includes this. In great plenty at Dagenham, Essex.

1190. *DIERVILLA* (cf.) *FLORIDA* (Bunge) Sieb. & Zucc. (*WEIGELA ROSEA* Lindl.) Alien, E. Asia. Ballumbie Den, Forfar, 1920, R. & M. CORSTORPHINE. Det. A. THELLUNG.

1292. *AMBROSIA PSILOSTACHYA* DC. Alien, N. America. Splott, Glamorgan, G. C. DRUCE, R. MELVILLE & R. L. SMITH. Det. Dr THELLUNG.

1474. *CENTAUREA ALGERIENSIS* Coss. & Dur. Alien, Algeria. Splott, Glamorgan, October 1926. Showed me by R. MELVILLE & R. L. SMITH. Det. Dr THELLUNG.

1850. *SOLANUM SARACHOIDES* Sendtn. Alien, Central America. Degenham, Essex, 1926, R. MELVILLE. Det. Dr THELLUNG.

2014. *SATUREIA ROTUNDIFOLIA* (Pers.) Briq. *CALAMINTHA ROTUNDIFOLIA* Benth. Alien, Mediterranean. Among barley cleanings, Burton-on-Trent, Staffs, 1926, G. C. DRUCE. Det. Dr THELLUNG.

2096. *CERATOPHYLLUM*. In the Proc. Bristol Nat. Hist. Soc., vol. vi., pt. iv., 303, 1926, Mrs Cecil Sandwith publishes a valuable paper on the Hornworts and their occurrence in Britain. We have, she states, two well defined species:—

*C. demersum*.—Leaves dark green, stiff, once or twice dichotomously forked, with 2-4 linear segments which are serrulate or denticulate-spinous; fruit smooth or sometimes pitted, at maturity producing near the base two lateral spines, and at the summit a spine which, with the style, at least equals and usually far surpasses the length of the fruit.

*C. submersum*.—Leaves a clear green, longer than those of *C. demersum*, thrice dichotomously forked, thus usually with eight very finely serrulate capillary segments, occasionally one of these fails to develop at the final lateral forkings. The fruit is hard and often covered with raised tubercles, which are scarcely visible when the fruit is young. There are no lateral spines near the base, and the style is much shorter than the fruit. The whole plant is softer and more collapsible than *C. demersum*.

The existence of *apiculatum* Cham., which belongs to *demersum*, is at present doubtful.

As will be seen from the above description the forking of the leaves offers a character to distinguish between the two species when not fruiting.

2114. *AMARANTHUS ANGUSTIFOLIUS* Lam., var. *POLYGONOIDES* (Moq.), sub-var. *ANGUSTISSIMUS* Thell. Alien. Par, Cornwall, L. MEDLIN. *Planta juvenilis forsan leviter monstrosa a typo normali abhorrens tepalis ♀ elongatis sub apicula terminali obtusis*, A. THELLUNG.

2390. *ASPHODELUS TENUIFOLIUS* Cav. Alien, India, &c. Abingdon, Berks, G. C. DRUCE & GAMBIER PARRY; Dagenham, Essex, R. MELVILLE.

2789. *FESTUCA LIGUSTICA* (L.) Willd., var. *CILIATA* (Parl.) A. & G. Alien, Medit. Sploft, Glamorgan, 1926, R. L. SMITH.

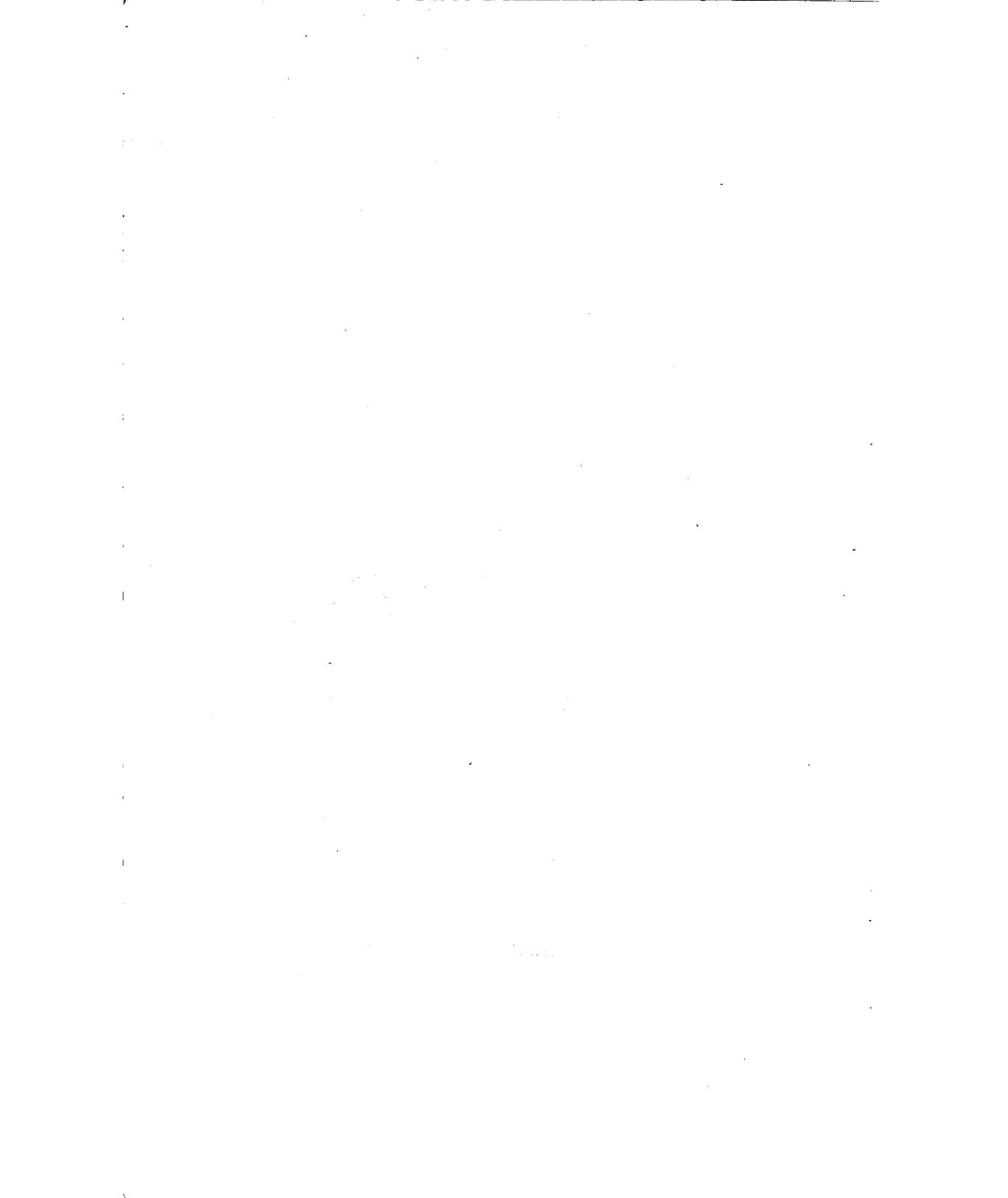
2797. *BROMUS TECTORUM* L., var. *GLABRATUS* Spenn. Alien. Glasgow, R. GRIERSON. Det. A. THELLUNG.

2878. *AGROPYRON PUNGENS* (Pers.) R. & L., var. *AFFINE* (Reichb.). *TRITICUM ACUTUM* DC., sens. strict. *L. PUNGENS* × *REPENS*, *ACUTUM* Asch. & Graeb. [2372]. Sandy Shore, E. Mersea, Essex, G. C. BROWN. Det. A. THELLUNG.

2919. *BOTRYCHIUM MATRICARIAE* (Schrank) Spreng. Syst. iv., 23, 1827. *B. rutaceum* Swartz 1801 non Willd. 1810. *B. matricarioides* Willd. 1810. *B. rutaefolium* A.Br. 1843. *Osmunda Matricariae* Schrank Baier. Flora ii., 419, 1789. Native. Grassy ground, Parish of Strachan, Kincardineshire (as *B. Lunaria* Sw.) T. Sim, July 1872, ex herb *Rev. H. E. Fox*, M.A., now in *Hb. Druce*. Rhizome short, with fascicled rootlets. Scottish plant, about 8 cm. high, with a rather thick green sterile leaf, rising from near the stem-base. Stem clothed with a few white hairs. Petiole semi-cylindric, limb small, somewhat curved, triangular, and as broad as long, 2-3 pinnatisect, pinnules elliptic, short, unequal at base, crenulate-dentate, segments sub-pinnatilobed, with few teeth. Fertile frond small, longly pedunculate, 3-4 pinnatisect, longer than the sterile frond. The Scottish plant comes under the var. *MONTANA* (Milde *Fil.* 200) Rouy Fl. Fr. xiv., 466, which is a smaller plant with the fertile frond less pedunculate and therefore not very much longer than the sterile frond. *B. Matricariae* may be distinguished from *Lunaria* by its compound broadly-triangular frond. *Lunaria* even in its more incised form has a narrower outline. The distribution of *B. Matricariae* is Scotland, Scandinavia, Denmark, France—Haute Savoie, etc., Germany, Czecko-Slovakia, Austro-Hungary, Serbia, Russia, Siberia, Japan, Unalaska, North America—Labrador, Newfoundland, Wisconsin, Vermont. *B. ramosum*, an allied plant with which *Matricariae* has been much confused (as is shown by the synonymy) differs essentially in the barren fronds springing from the stem above the middle, not as in *Matricariae*, from the base. *B. ramosum* (Roth) Ascherson Fl. Brandenburg i., 906, 1864 = *B. rutaceum* Willdenow Sp. Pl. v., 62, 1810, non Swartz = *B. matricariaefolium* A.Br. occurs in Northern and Central Europe and North America. It may be remembered that Mr Whitwell (*Journ. Bot.* 291, 1898) mentions that *Botrychium matricariaefolium* A.Br. was given him by Dr. O. St Brody under the name *B. rutaceum* Swartz as having been gathered by him on the sandy sea-shore of Stevenston, Ayrshire, in July 1887. Whitwell says it agrees perfectly with the figure given by Newman (*Phyt.* v., 133, 1854). This has never been confirmed; nor has the supposed *B. lanceolatum* Angst. from the Sands of Barry, Forfar. It should be added that the Strachan specimen is not complete, and the identification is therefore not absolutely certain.



**BOTRYCHUM RUTACEUM SW.**



SUPPLEMENT TO REPORT OF BOTANICAL SOCIETY AND  
EXCHANGE CLUB FOR 1926.

## MENTHAE BRITANNICAE.

By JOHN FRASER.

## MENTHA L.

Perennial, strongly-scented, aromatic herbs, creeping by means of stolons, which perpetuate the plant, the old rootstock dying within twelve months. Flowers small, produced in verticils of many individuals, the verticils densely arranged and spicate or capitate, or  $\pm$  widely separate and verticillate. Bracts subulate or large and foliaceous; bracteoles small and numerous, or reduced to four in *M. Pulegium*. Calyx tubular or campanulate, ribbed, 5-toothed, glabrous within or closed with hairs in *Pulegium*. Corolla campanulate, four-lobed, the upper lobe broader and emarginate. Stamens 4, erect, distant, equal, exerted or imperfect and included. Nutlets small, smooth.

## I. Calyx glabrous within.

- A. Inflorescence spicate; leaves sessile or subsessile; pedicels and calyx hairy.

*MENTHA ROTUNDIFOLIA* Huds. Fl. Angl., p. 221 (1762). Stem erect, simple or more often branched from the middle upwards, and in that state giving the impression of a leafy panicle,  $\pm$  densely covered with loosely reflexing, white hairs; internodes 2-4 cm. long. Leaves varying from oblong to ovate or subrotund on the same stems, subcordate at the base, rounded at the apex or terminated by a minute cusp, crenate or dentate, with a minute cusp to some of the teeth, rugose above and often on both faces when dried, pubescent above, tomentose beneath, but much more thinly hairy on both faces when growing near the water edge of rivers, and in gardens; superficies 2-4  $\times$  1.5-3 cm.; teeth 0.25-1 mm. deep. Spikes dense, falcate when young, short,  $\pm$  interrupted at the base, 3-5 cm. long. Hairs on the pedicels deflexed. Calyx hairy all over. Corolla hairy externally, pale pinkish purple, sometimes white in gardens. Stamens usually exerted.

Herb strongly fragrant, and known as Apple-scented Mint in gardens. River Towy, Carmarthen; Pennar, Pembroke, 1885, *J. Fraser*; between King's Newton and Ingleby, Derby, 1901, *A. B. Jackson*.

× *MENTHA CORDIFOLIA* (Opiz) Fraser. *M. cordifolia* Opiz Natural. brertes berzeichnis (1823), p. 59. *M. crispa* Fürnrohr. *M. crispa* Lejune, non *M. crispa* Linn. (*M. rotundifolia* × *spicata*.) Stems stout, erect, 1½-3 ft. high, thinly and shortly pilose, simple or freely branched from near the ground, with short, ascending branches, very vigorous in cultivation, late in starting; internodes 3-5 cm. long. Leaves cordate, subsessile, or cordate-ovate in cultivation, strongly rugose, unequally cuspidate-serrate, slightly undulate at the margin, sparsely pilose on the veins beneath, otherwise subglabrous, those on the branches cordate-oblong, all acute, cuspidate; superficies 2-7 × 1.5-4 cm.; serratures mostly directed forward, acute or cuspidate, 0.5-2 mm. deep; petioles, when present, thinly pilose. Primordial leaves at first subrotund, then oblong, very shallowly crenate-serrate, rounded at the end; petioles 1-4 mm. long. Spikes solitary or densely crowded at the top of the stem, very stout, tapering upwards, curved outwards when young, interrupted at the base, 2.5-4.5 cm. long. Lowest pair of bracts lanceolate, with a few subulate teeth, the rest linear-lanceolate, with setaceous points, ciliate, completely hidden during anthesis. Pedicels and base of calyx glabrous; calyx teeth shortly ciliate. Corolla pale, whitish pink. Stamens exerted; anthers purplish red.

Waste ground, Swanage, Dorset, 1914, *C. B. Green*.

Forma *ANGUSTIFOLIA* Fraser. In 1922, a root of the above plant gave rise to a sport, like a reversion towards *M. spicata*. The leaves are 3-7 × 0.5-2 cm. in superficies, and are rather more pilose than the parent.

Var. *DOURENSIS* Fraser. (*M. rotundifolia* × *spicata*.) In most respects similar to × *M. cordifolia*, but the young stems and leaves are tinted with purple. The serratures of the leaves are more slender, sometimes subulate and 0.5-3.5 mm. deep. The spikes are more slender, more interrupted at the base, and 4.5-9.5 cm. long. The corolla is purple, with occasionally exerted stamens, and anthers reddish purple.

This hybrid was known to Linnaeus and Smith, the latter placing it under *M. viridis*, as a variety, but he had not seen it wild in Britain.

The Dour Burn, New Aberdour, N. Aberdeen, 1915, *J. Fraser*.

Var. *BREVI-FOLIA* Fraser. (*M. rotundifolia* × *spicata*.) Stem rather slender for this group, branched from the base, with short ascending branches, glabrous or with an occasional few, solitary, scattered hairs, 12-18 in. high; internodes 2-4 cm. long. Leaves oblong, subcordate and often rounded at the base, acute, cuspidate, acutely and irregularly serrate, with a few, solitary hairs on the nerves beneath, otherwise glabrous, finely rugose, bright green, subsessile (petiole 1-2 mm. long); superficies 2-4 × 1.5-2.7 cm.; serratures 0.25-1.75 mm. deep. Spikes cylindrical, interrupted at the base, dense, about 3 cm. lengthening to 5 cm. with age, when the verticils become separated by short intervals. Lowest pair of bracts lanceolate, with a few serratures, the rest linear-lanceolate, with setaceous points, shorter than the flowers, shortly ciliate. Pedicels and base of the calyx glabrous, glandular; calyx teeth shortly ciliate with white setae. Corolla pale purple. Stamens exerted; anthers reddish purple.

The above plant very nearly agrees with *M. affinis* Opiz, but differs in the leaves being distinctly rugose, in the leaves of the branches being of the same shape as those on the stem, but smaller. This, as well as some other slightly varying forms of the hybrid were known to Ray, who made species of them. Smith placed them as varieties under *M. viridis*, var.  $\beta$ ; and Hudson put them under *M. longifolia*. They are grown in many Surrey gardens for Mint Sauce and Pea Mint. Outcast on Abrook Common, Surrey, 1922, *J. Fraser*.

*MENTHA LONGIFOLIA* Huds. Fl. Angl., p. 221 (1762). *M. sylvestris* L. Sp. Pl. 864. Stem erect, simple or branched from the middle upwards, according to the degree of crowding or otherwise, thinly hairy below, densely hairy above, with closely deflexed or retrorse hairs, 2-3 ft. high; internodes 1.5-5 cm. long. Leaves narrowly or broadly lanceolate, or some of the lower, larger ones lanceolate-oblong, acute or shortly acuminate, sessile or subsessile, sharply serrate,  $\pm$  hairy above, the upper ones more densely so, and green, the lower surface grey with adpressed hairs, even or sometimes finely rugose, especially when young; superficies 3-8  $\times$  1-3 cm.; serratures mostly directed forward, but some of them salient, and concave on the lower side, 0.25-2 mm. deep. Primordial leaves in May thinly hairy and green. Spikes cylindrical, tapering upwards, dense while in bloom, but as the corollas drop, the verticils in turn become separated, so that the length varies from 3-10 cm., and the spike is then slender. Pedicels and calyx hairy. Corolla hairy without, glabrous within. Stamens exserted.

Long, narrow leaves and slender spikes are the best evidence of this species. The specimen in the Linnean herbarium shows a slender plant, which I can match with an outcast on Ranmore Common, Surrey, 1916. The hairs on all parts of the herb are long, slender, jointed and branched. Applshaw, N. Hants, 1917, *Hon. Mrs Baring* and *G. C. Druce*; Surrey, 1917, *Lady Davy* and *G. C. Druce*; Walton-in-Gordano, N. Somerset, 1925, *J. W. White*; Gomshall, Surrey, 1925, *J. Fraser*.

Var. PULVERULENTA (Strail). Class. et. Descr. "Menth. en Belgique," p. 78. Leaves broadly lanceolate, acute, sessile, slightly subcordate at the base sharply but not deeply serrate, thinly and shortly hairy above, with a powdery or mealy appearance, due to the pedastals or lowest joints of the hairs being brought into prominence by the shedding of the upper joints, lower surface distinctly more hairy, pilose on the principal nerves and whiter.

The variety corresponds to the mealy-leaved *M. Nicholsoniana*, under *M. niliaca*. (Banks of the R. Darent above Farningham, W. Kent, 1894, *E. S. Marshall*.)

Var. WEINERNIANA Brig. *M. Weinerniana* Opiz. *M. florida* Opiz, not Pausets. *M. Wondracekii* Opiz. Stem erect, 2-3 ft. high, branching, thinly hairy below, more densely hairy above; internodes 2-5 cm. long. Leaves broadly lanceolate, shortly acuminate, sessile or subsessile, subcordate at the base on the main axis, rounded on the branches, green and hairy above, grey tomentose beneath; superficies 3-8  $\times$  1-3 cm.; ser-

ratures small, acute, 0.25-2 mm. deep. Spikes cylindrical, dense, interrupted below. Near Marcham, Berks, *G. C. Druce*.

Var. *ALPIGENA* (A. Kern.) Briq. (1913). Stem erect, 2-3 ft. high, branched towards the top, rather thickly covered with short, sharply retrorse hairs; internodes almost regularly 4 cm. long. Leaves lanceolate, widest about the middle, acuminate, sharply and rather irregularly serrate, sessile and subcordate at the base, green above and rather closely covered with short, adpressed hairs, beneath tomentose or felted and whitish; superficies 5-8.5 × 1-2 cm.; serratures 0.25-1.5 mm. deep. Spikes *short*, very stout, oblong, tapering slightly, dense, interrupted at the base, 3.5-4.5 cm. long, when in flower. Bracts setaceous, plumose, all longer than the corolla when in bloom. Corolla hirsute without; stamens included.

I have consulted Strail's description of *M. veronicaeformis* Opiz, in Déséglise *Menthae Opizianae* II., p. 27 (1882), to which var. *alpigena* has been compared; but Strail's description states that *M. veronicaeformis* Opiz has leaves only up to 5.5 cm. long, and they are *crowded* on the stem, whereas those of var. *alpigena* are distant from one another. The lowest bracts equal the verticils after anthesis, and the others are shorter than the verticils. The stamens are exerted. This should be a very different Mint from A. Kerner's plant. The only specimen to hand was gathered near Kirkiner, Wigton, 1912, by G. C. Druce.

× *MENTHA NILIACA* Jacq. Hort. Vindob. III., p. 46, t. 87 (1776-1777). (*M. longifolia* × *rotundifolia*.) Stem stout, erect, freely branched, with slender, sharply ascending branches, moderately densely villous with loose hairs below, but closely covered with sharply deflexed or retrorse hairs above, 2-3 ft. high; internodes 3.5-6 cm. long. Leaves narrowly ovate, gradually narrowed from near the base to a long, acuminate, very acute point, sessile, cordate at the base, sharply serrate, thinly hairy with very short hairs above and dark green, under surface grey tomentose with short hairs, but pilose on the principal nerves with hairs of medium length, ± netted with sunk veins on both faces; superficies 3.5-7.5 × 1.5-2.5 cm.; serratures very numerous, directed forward, irregular in size and spacing, but never very deep (0.25-2 mm., average 1 mm.), acute; leaves of the branches lanceolate, otherwise like those of the stem. Spikes cylindrical, very dense, 3.5-4 cm. long, the lateral ones close under the main spikes, nearly horizontally patent. Bracts setose, plumose, slightly longer than the open corolla. Pedicels villous with 3-5 jointed, loosely reflexing hairs. Calyx villous; teeth lanceolate, very slender, ciliate with 2-6 jointed hairs. Corolla pale lilac-purple. Stamens included, rarely exerted.

This hybrid Mint lies between the vars. *mollissima* and *sapida* with similarly shallow serratures, and like them has spikes ± round about an inch long, relatively slender, not interrupted, and the upper surface of the leaves is dark green. The leaves are also far more attenuate at the apex than either, and very different in appearance. It heads the

list in this group of hybrids because the oldest described. Near Abingdon, Berks, 1926, *G. C. Druce*.

Var. NEMOROSA (Willd.) (*M. longifolia* × *rotundifolia*.) Stems stout, simple or more often branched, with short, ascending branches, thinly hairy below, especially in watery ditches, densely hairy above with ± closely deflexed or retrorse hairs, 2-3 ft. high; internodes 2-6 cm. long. Leaves oblong, or ovate-oblong (lower ones), acute, cuspidate to shortly acuminate, subcordate at the base, sharply, deeply, and irregularly serrate, *short and broad*, thinly and shortly hairy, sometimes nearly glabrous and green above, beneath thinly to densely hairy, or thinly felted in dry situations, sessile or the lower ones shortly petiolate (up to 5 mm.); superficies 3.5-8.5 × 1.5-4 cm.; serratures directed forward, or some of them salient, and concave on the lower side, 0.5-3 mm. deep. Primordial leaves in May oblong, rounded at the end to obtusely pointed, subentire or shallowly serrate, subglabrous, light green. Spikes cylindrical, dense, interrupted below, 3-8 cm. long. Pedicels densely covered with deflexed hairs, calyx covered with ascending adpressed, grey hairs. Stamens included, rarely exerted.

The features of this hybrid are the *short, broad oblong* leaves, more or less netted with *sunk veins* on one or both faces, and the functionally *female* flowers. It is the most common of the forms in Britain usually placed under *M. longifolia* as a variety, and varies greatly in appearance in different places, but it would serve no useful purpose to segregate and describe forms. Holyhead, Anglesey, 1917, Beaumaris, Anglesey, 1919, Marston, Oxon, 1919, Ellesborough, Bucks, 1896, Wolvercote, Oxon, 1912, Yarnton, Oxon, 1913, Brickhill, Bucks, 1902, Branstock, Cornwall, 1908 (stamens exerted), Cothill, Berks, 1893 (stamens exerted), all by *G. C. Druce*; Penzance, W. Cornwall, 1875, W. Curnow (stamens exerted); Llwydcoad, Glamorgan, *H. J. Riddelsdell*; between Kimble and Ellesborough, Bucks, 1911, *F. L. Foord-Kelcey*; The Lythe, N. Riding, Yorks, 1882, *C. E. Palmer*; R. Wandle, Croydon, 1878, *A. Bennett*; Marston Montgomery, Derby, 1897, *H. Bromwich*; Galashiels, Selkirk, 1913, *G. C. Druce* and *I. M. Hayward*; Wargrave, Berks, 1901, *G. Stanton*; R. Tay, below Perth, 1871, *H. M. Drummond-Hay*; Coleford, Gloucestershire, 1869, *Dr H. Brody*; Newland, W. Gloucester, 1910, *Charles Bailey*; near Malvern, Worcester, *Wall*; Eynsford, Kent, 1881, *James Groves*; R. Chew, N. Somerset, 1887, *J. W. White*; Slateford, Edinburgh, 1920, *James Fraser*; Peterston super Ely, Glamorgan, 1921, *A. E. Wade*; Carbrook Fen, W. Norfolk, 1914, and Marham, W. Norfolk, 1921, *F. Robinson*; Nutfield Marsh, 1916, and Reigate Heath, Surrey, 1925, *Smeeh and the Potteries, Aylesford, E. Kent, R. Medway above Maidstone, and Leybourne, W. Kent, 1919, J. Fraser*. Of 34 sheets, only three had exerted stamens.

Var. NICHOLSONIANA (Strail.) (*M. longifolia* × *rotundifolia*.) Stems 1½-2½ ft. high, stout, erect, simple or freely branched from the middle upwards, with short, ascending branches, and ± densely covered with short, sharply deflexed hairs. Leaves oblong to ovate-oblong, *short*, acute, cuspidate, or the uppermost shortly acuminate, sessile, or the

lowest on the main axis and on the branches shortly petiolate, subcordate at the base, sharply and irregularly serrate, *shortly hairy on the upper surface, exposing the large basal joints of the hairs*, and giving the leaf a *mealy appearance*, under surface thinly to densely hairy or thinly felted,  $\pm$  netted with sunk veins. Spikes stout, cylindrical, dense, 3-8 cm. long,  $\pm$  interrupted at the base. Stamens included.

The above characters largely repeat those of the var. *nemorosa*, so that the *mealy pubescence* of the upper and to a lesser extent the under surface constitutes the most decisive feature of this variety. Comments have been made that the specimens from Three Cocks Junction had long bracts to the flowers, but those specimens were not fully in bloom; and that the leaves should be petiolate, but that applies only to the lower leaves of the main axis and to those of the branches. The latter character applies to *M. longifolia* itself and even to *M. spicata*, as well as the hybrids of the former. R. Wye, Whitney, Hereford, 1889, R. Wye, near Hereford, 1899. Three Cocks Inn, Brecon, 1907, all by *Augustin Ley*; Whitney on Wye, *Walter W. Reeves* and *M. Dawber*, both in 1890; Newland, Forest of Dean, W. Gloucester, 1910, and Glen Lea, Hindhead, Surrey, 1905, *Charles Bailey*; R. Wye, Symond's Yat, 1900, Crickhowell, 1908, Broughood, Radnor, 1908, Scampton Hall, Yorks, 1916, *G. C. Druce*; Canton, Cardiff, Glamorgan, 1922 and 1923, *R. L. Smith*.

Var. MOLLISSIMA (Borckh.). (*M. longifolia*  $\times$  *rotundifolia*.) Stem stout, erect, simple or branched for the greater part of its length, with short, ascending branches, rather thickly covered, with short, retrorse closely adpressed hairs, 1 $\frac{1}{2}$ -2 $\frac{1}{4}$  ft. high; internodes 4-6 cm. long. Leaves oblong, suddenly narrowed to a cuspidate, obtuse or acute point, sessile or subsessile, sometimes with a petiole 2-3 mm. long on the small, lanceolate leaves of the branches, sharply serrate, *grey-green above* and closely covered with very soft closely adpressed pubescence, beneath *more densely felted, grey and soft*,  $\pm$  lined or netted with sunk veins on both faces; superficies 3-8.5  $\times$  1-2.5 cm.; serratures 0.25-2 mm. deep. Spikes short cylindrical, slightly tapered upwards, curving outwards when young, sometimes interrupted at the base, rather stout, 2.5-4.5 cm. long. Pedicels covered with fine woolly hairs. Calyx with adpressed hairs; teeth long, slender. Corolla purple, hairy without. Stamens usually included.

The leaves of this hybrid are relatively longer and narrower than those of var. *nemorosa*, more uniformly oblong, and the indumentum is of a blue-grey tone and very soft to the touch, which characters serve to distinguish it. Baildon, Mid-west Yorks, 1917, and Hawkesworth, Mid-west Yorks, 1925, *John Cryer*; Stow Bedon, W. Norfolk, *E. M. Reynolds*, 1917 (stamens exerted in this).

Var. VILLOSA (Huds.) *M. villosa* Huds. Fl. Angl. ed. 2, p. 250 (1778). (*M. longifolia*  $\times$  *rotundifolia*.) Stem erect, simple or branched from the middle upwards, with ascending branches, stout, clothed with  $\pm$  loosely deflexed hairs, thin below and dense above, 2-3 ft. high; internodes 3-4.5 cm. long. Leaves oblong to ovate-oblong, acute, or more often suddenly narrowed to a small cusp, sessile, cordate at the base, sharply and irregularly serrate, densely covered with short hairs above, and rugose, be-

neath densely covered with a whitish-grey tomentum, and when dry,  $\pm$  furrowed and netted on both faces with sunk veins; superficies 3.5-8  $\times$  1.5-4 cm.; serratures directed forward, some salient and concave on the lower side, 0.5-2 mm. deep. Primordial leaves varying from subtroutund to oblong, shallowly serrate, nearly glabrous, shortly petiolate. Roots from a wild habitat in the garden shed much of their hairs at the joints on both sides of the leaves, till the upper surface shows a mealy pubescence, much like that in the var. *Nicholsoniana*. Wild plants sometimes behave in the same way. Spikes stout like a fox's tail, and curved outwards when young, later elongated, cylindrical, interrupted at the base, 3.5-6.5 cm. long. Bracts subulate, hirsute, completely hidden during anthesis. Corolla pale purple, hairy. Stamens shorter than the corolla or equalling it, very rarely longer than it.

Comparable to the var. *nemorosa*, this has much broader, more strongly rugose, and darker green leaves, more densely tomentose beneath. The leaves vary immensely in size, according to the soil and moisture, even in the same habitat. Near Freeland, Oxon, 1916, Thames banks, Ilsley, Berks, 1895, Levenwick, Zetland, 1924, W. Ross, 1926, *G. C. Druce*; Gt. Henny, N. Essex, 1916, *J. Higgins*; near Woodhouse Eaves, Leicester, 1895, *F. T. Mott*; Little Brickhill, Bucks, 1897, *G. C. Druce*; near Stevenage, Herts, 1846, *W. H. Coleman*; Sherard's Green, Malvern, Worcester, 1923, *T. J. Wall*; Legaston Quarry, near Arbroath, 1912, *R. and M. Corstorphine*; Stradsett, W. Norfolk, 1833, *A. B.* (specimens in bloom only 6 in. high); Basset near Eastleigh, S. Hants, 1921, *Emily S. Todd* (two sheets from a dry roadside with exerted stamens!); near Virginia Water, Surrey, 1925, *J. Fraser*; Norfolk, 1913, *Miss Trower*. This specimen has lost the leaves of the main axis, the branches are very numerous, slender, bearing small nearly glabrous leaves, the spikes are elongated, with verticils all separated, and the bracts lanceolate to ovate and leafy. I think this has been growing in a spot frequented by poultry, and too much nitrogen in the soil has made growth abnormal.

Var. *SAPIDA* (Tausch) Briquet (1894). *M. sapida* Tausch, ex Reichb. Fl. Ger. Excurs. p. 310 (1830), with syn. *M. Halleri* Gmel. *M. villosa* Huds., var. *sapida* (Tausch) Briquet (1913), in Bot. Ex. Club, 1913, p. 332. (*M. longifolia*  $\times$  *rotundifolia*.) Stem stout, erect, simple or branching for the greater part of its length, with short, ascending branches, rather thinly hairy towards the base, densely covered for the greater part of its length with loosely deflexed white hairs, bearded at the nodes, 2-5 ft. high; internodes 4-6.5 cm. long. Leaves cordate-elliptic, subsessile, acute, cuspidate or shortly acuminate, shallowly serrate on the lower leaves, a little more deeply and irregularly serrate on the upper leaves, blue green on the upper face, and  $\pm$  densely covered with adpressed pubescence, grey-white beneath and densely tomentose with long, white, jointed, branched and interlacing, woolly hairs, soft to the touch on both faces,  $\pm$  netted and furrowed with sunk veins beneath; superficies 5-10  $\times$  2-4.5 cm.; serratures mostly directed forwards, 0.25-1.5 mm. long. Primordial leaves large, green, rather thinly hairy. Spikes cylindrical,

stout, very dense, 3-5.2 cm. long (Tausch says "flores et verticilli minimi"). Bracts setaceous, plumose, completely hidden during and after anthesis. Corolla pale purple, hairy. Stamens included, very rarely exerted. Calyx hairy. Pedicels enveloped in long, reversing, interlacing, jointed, woolly hairs, perhaps the most woolly pedicels of any Mint.

The above is the most striking and splendid Mint when seen in its best form. Jean Briquet says "forma valde lanigera;" and if that woolly character be borne in mind, as well as the large, cordate-elliptic leaves, the shallow serratures, and the short dense spikes of small verticils, there should be no difficulty in recognising this Mint by whatever name it is called. Mouth of the R. Whiteadder, near Berwick-on-Tweed, 1870, *P. N. MacLagan* (under the name *M. sylvestris* L.); Glen Ogilvie near Glamis, Forfar, 1896, *T. Drummond* (*M. sylvestris* L., var. *mollissima* (Borckh.)); Brodie Burn, near Forres, Moray, 1898, *W. A. Shoolbred* and *E. S. Marshall* (*M. candicans* Crantz?); Dunbarney, near Perth, 1906 (*M. longifolia* Huds., var. *mollissima* (Borckh. ?)), Glen Ogilvie, Forfar, and the South Esk, Bridge of Dun, Forfar, 1912, *G. C. Druce* (*M. longifolia* Huds. var., and determined by Briquet to be *M. villosa* Huds., var. *sapida* (Tausch) Briq. 1913); Glen Ogilvie, Forfar, 1926, *R.* and *M. Corstorphine* (the best specimens I have seen).

Var. *ALOPECUROIDES* (Hull) Briquet (1894). *M. alopecuroides* Hull Brit. Fl. I., 126 (1799). *M. rotundifolia* Sole Menth. Brit. p. 9, t. 4 (1798). (*M. longifolia* × *rotundifolia*). Stem very stout, erect, simple or branched from near the base upwards, rather thinly hairy below, more densely so upwards, with ± loosely reflexed hairs, bearded at the nodes, 2-5 ft. high; internodes 2-6 cm. long. Leaves broadly oblong, sessile, cordate at the base, the uppermost roundly cordate, all rounded at the end, coarsely serrated, terminating in a short, cuspidate tooth, rugose, thinly and shortly hairy and dark green above, beneath villous or occasionally thinly felted, but never white; superficies 3.9 × 2.6-5 cm.; serratures rather irregular, mostly directed forward, with a few salient ones, concave on the lower side, 1-4 mm. deep. Spikes stout, obtuse, somewhat curved outwards when young, dense, occasionally interrupted at the base, 3-5.5 cm. long, lengthening to 8 cm. after flowering when the verticils become slightly separated, and 1-20 in number in a terminal panicle, according to the vigour of the plant. Bracts setaceous, shortly hairy, completely hidden during anthesis. Pedicels covered with loosely reflexing hairs. Calyx shortly hairy. Corolla rosy-purple, hairy without. Stamens included or a few shortly exerted.

Recognisable by its stout stems, large, shortly and broadly oblong, or subrotund, rugose, coarsely serrated leaves, villous beneath. Often cultivated in cottage and villa gardens, from which the long and very vigorous stolons get thrown out and run wild. Gomshall and Dunsfold Green, Surrey, 1925, *J. Fraser*; near Rescobie, Forfar, 1913, *R.* and *M. Corstorphine*; Symond's Yat, W. Gloucester, 1926, *Mrs Wedgwood*.

\* Inflorescence spicate; leaves stalked; pedicels and calyx hairy.

× *MENTHA HIRCINA* (Hull) Fraser. *M. hircina* Hull Brit. Fl. I., 127 (1799). *M. piperita sylvestris* Sole Menth. Brit. p. 53, t. 24 (1798). *M. pubescens* auct. pl. (*M. aquatica* × *longifolia*.) Stem erect, simple or branched, with short, ascending branches, rather thinly covered with closely deflexed hairs; internodes 2.5-4.5 cm. long. Leaves oblong, obtuse, to acute or cuspidate, petiolate, rounded at the base or very shortly cuneate, finely and almost regularly serrate, green above and thinly strewn with short closely adpressed hairs, rather more densely hairy beneath, with very short hairs and shortly pilose on the principal nerves, the uppermost pair of leaves short and ovate; superficies 3.5-7 × 1.8-2.8 cm.; serratures 0.25-1 mm. deep; petioles 2-7 mm. long. Spike oblong, obtuse, interrupted at the base, 2.7 cm. long. Lowest pair of bracts lanceolate, leafy with a few serratures, the rest linear-lanceolate to setaceous, about as long as the open flowers, rather shortly hairy and ciliate with white hairs. Pedicels covered with closely retrorse hairs. Calyx and long teeth wholly covered with short, ascending, curled hairs. Corolla very hairy without. Stamens included.

The above description is drawn up from a specimen in the herbarium of Dubois, and gathered by Mr Stonestreet. It is characteristic of four other sheets in the same herbarium, with rather larger specimens and larger leaves. The modern specimens being collected for *M. hircina* Hull are all too hairy for this plant, and are the next variety.

Var. *HIRSUTA* Fraser, var. nov. (*M. aquatica* × *longifolia*.) Stem stout, erect, simple or more often branched, with short, ascending, flowering branches, shaggy with loosely recurving, white hairs, 2-2½ ft. high; internodes 3.5-4 cm. long, on wild plants in exposure, but in shady places, or in cultivation 5.5-6.5 cm. long. Lower leaves oblong, obtuse or acute, cuneate or rounded at the base, upper ones lanceolate, all sharply and irregularly serrate, with occasional denticles between the larger ones, *densely hairy above, tomentose beneath*, pilose on the nerves, with long hairs; superficies 3.5-5 × 1.4-2.3 cm.; in wet or shady places, and in cultivation the superficies mounts to 6-8.5 × 2.5-3.3 cm.; serratures mostly directed forward, but some are salient and concave on the lower side, 0.5-2 mm. deep. Spikes oblong, obtuse, stout, ± interrupted at the base, and on strong specimens there are frequently a pair of pedunculated spikes from the uppermost pair of leaves. Bracts lanceolate to setose, hirsute with long white hairs, shorter than the flowers, and one to two lower pairs may be large and leafy. Pedicels very hirsute with loosely deflexed white hairs. Calyx wholly hairy. Corolla purple, hairy without. Stamens included, seldom exerted and then without pollen.

Roadside at Bayford, Herts; damp, grassy lane, Weston-in-Gordano, N. Somerset, 1919, *Ida M. Roper* and *C. Bucknall*, and 1924, *James W. White*; The Dour Burn, New Aberdour, N. Aberdeen, 1915, *J. Fraser*. Cultivated plants of the last named look grey while growing, but the stems and leaves have shorter hairs than the wild plants, so that the

long, straight hairs on the nerves of the lower face become very prominent.

× *MENTHA PALUSTRIS* (Sole) Fraser. *M. palustris* Sole Menth. Brit. p. 13, t. 6 (1798). (*M. aquatica* × *longifolia*.) Stem erect, simple or branched, with short, ascending branches, shaggy with loosely reflexing hairs, 2-3 ft. high; internodes 3-4.5 cm. long. Leaves ovate, or the lower ones broadly oblong, subcordate at the base, obtuse to acute, or cuspidate, petiolate, rather finely and acutely serrate, green above and rather densely hairy, tomentose beneath, and pilose on the nerves; superficies 2-4 × 1.5-2.5 cm.; serratures directed forward, 0.5-2 mm. deep; petioles 3-7 mm. long. Spikes oblong, obtuse, interrupted at the base, with the lowest verticil of strong stems pedunculated. Bracts lanceolate to setose, hirsute, shorter than the flowers, or the two lowest pairs leafy and longer. Pedicels and calyx hirsute. Corolla pale purple, hairy. Stamens included.

Newlyn, Cornwall, *A. Bennett*; Chyoogue, Perranarworthal, Cornwall, 1911, *Fred. Hamilton Davey*.

\*\* Inflorescence spicate; leaves sessile; pedicels and base of calyx glabrous except in × *M. Nouletiana*.

× *MENTHA VILLOSO-NERVATA* (Opiz) Fraser. *M. villoso-nervata* Opiz Natural. brertes berzeichnis (1823) p. 60. *M. viridis* Bönninghausen herb. *M. viridi-sylvestris*? re Malinvaud. (*M. longifolia* × *spicata*.) Stem stout, erect, branched, with ascending branches, ± villous with loose, curled hairs; internodes 2-4 cm. long. Leaves oblong, sessile or subsessile, subcordate at the base, or those on the branches lanceolate and rounded at the base, acute or having a longish entire point, acutely, unequally serrate, glabrous above or with a few scattered, adpressed hairs, villous or pilose on the nerves beneath, slightly rugose (subplanis), with sunk veins above when dry; superficies 3-7.5 × 1.2-2.5 cm.; serratures mostly directed forward, often incurved at the points and 0.25-2 mm. deep. Spikes cylindrical, interrupted at the base, 2-3.5 cm. long. Pedicels and base of the calyx glabrous, glandular, glands of the former pin-headed; calyx teeth ciliate with long, 2-4 jointed hairs. Bracts setaceous, hirsute, with 3-6 jointed hairs. Corolla purple. Stamens included.

This certainly looks more like *M. spicata*, when seen growing, than the other supposed parent, though the hairiness of the stems, leaves, bracts and calyx teeth suggest hybridity. Near Lostifield, Womersh, Surrey, 1894, *S. T. Dunn*; Friday Street, Surrey, 1926, *J. Fraser*.

× *M. NOULETIANA* Timb.-Lagr.? (*M. longifolia* × *spicata*.) Stem fairly stout, erect, branched above the middle, ± villous throughout, with reflexing curled hairs of medium length; internodes 2.5-6.5 cm. long. Leaves oblong-elliptic, sessile, subcordate at the base, with a long, cuspidate, entire, acute point, deeply and sharply serrate, rather

densely pubescent above with very short hairs that expose the green surface, dull grey and felted beneath; serratures directed forward, very irregular in size and spacing, many of them salient or spreading widely, triangular at the base, with a subulate, acute, often incurved tip, 1-3.5 mm. deep; superficies 3.5-7 × 1.8-2.5 cm. Spike slender, much interrupted, cylindrical, with small, dense verticils, 4-6 cm. long. Bracts setaceous, plumose, the lowest two pairs longer than the verticils, the rest equalling the corolla when open. Pedicels, calyx, and calyx-teeth shaggy with 3-6 jointed, woolly-looking hairs. Corolla pale, with violet-purple centre to each lobe. Stamens included.

The main features of this hybrid are the oblong-elliptic, very deeply serrate leaves, and the slender, much interrupted spikes on the main axis and branches. It is much nearer *M. longifolia* Huds. than to *M. spicata* Huds. The slender, much interrupted spikes are the chief evidence of the latter. *M. nemorosa* sometimes has very deep serratures, and the woolly character of the hairs of all parts of this plant indicate a close relation to it. × *M. villosa-nervata* is very much closer to *M. spicata* in all parts. Montpellier, Belfast, Co. Antrim, 1926, *Jas. W. White*.

MENTHA SPICATA Huds. Fl. Angl. p. 221 (1762). *M. spicata*, var. *viridis* L., 1753. *M. viridis* L., 1762. Stem erect, simple or more frequently branched, glabrous, 2-2½ ft. high; internodes 2-5.5 cm. long. Leaves lanceolate or oblong-lanceolate, acute to acuminate, sessile or subsessile (petioles often 1-3 mm. long), serrate, glabrous on both faces; superficies 4-9 × 1.3-3 cm.; serratures acute, mostly directed forward, 0.25-2 mm. long. Primordial leaves short, oblong, rounded at the ends, very shallowly serrate, gradually giving place to the summer leaves. Spikes ± paniced on the top of the main axis, cylindrical, slender, narrowing to the apex, the verticils gradually becoming separated with age, and 3-6 cm. long. Bracts linear-setaceous, or the lowest pair lanceolate and leafy, longer than the flowers, but usually incurved, subglabrous or shortly ciliate. Pedicels and calyx-tube glabrous; calyx teeth subglabrous or with ciliæ of slightly varying length. Corolla purple, glabrous without and within. Stamens exerted, but variable in length.

Recognisable by the lanceolate, glabrous leaves, slender spikes and pungent smell. Field and hedge at the foot of Boxley Hills, E. Kent, 1919, near Fetcham, Surrey, 1920, J. Fraser. Spearmint is much cultivated and frequently an outcast from gardens.

Var. LACERATA (Opiz) Fraser. *M. lacerata* Opiz Naturalientausch, p. 60 (1831). *M. viridis* β *crispa* Benth. (1855 or earlier) non Linn. Stem 2 ft. to 2½ ft., stout, erect, glabrous, much branched; internodes 2-4 cm. long. Leaves ovate, cordate at the base, sessile, slashed, incised and serrate in a variety of ways, with long, acute and entire points, strongly rugose, glabrous on both faces; superficies 2-3.5 × 1.5-2.5 cm.; laceræ 2-8 mm. long; leaves of the branches lanceolate, with serratures and incisions 1-3.5 mm. long. Spikes cylindrical, dense, very freely produced, stout for *M. spicata*, elongating with age and becoming ± in-

interrupted at the base, 3-6 cm. long. Bracts linear-setose, shortly ciliate, almost glabrous, hidden during anthesis. Pedicels and base of calyx glabrous; calyx-teeth with short hairs of 1-2 joints. Corolla purple, glabrous without. Stamens exerted, anthers reddish purple. Seeds abundantly produced.

Glenfarg, Perthshire, previous to 1855. Cultivated in Kew and Oxford Botanic Gardens. Opiz says of it, "Cultivated and run wild."

× MENTHA CRISPA (L.) Fraser. *M. aquatica* L. ♂ *M. crispa* L. Sp. Pl. ed. 2, p. 805 (1763) pro specie, ex H. Braun in Verhand. Geol.-bot. Gesells. in Wien (1890). *M. aquatica* L. β *crispa* Benth. (*M. aquatica* × *spicata*.) Stem simple or branched, with short ascending branches, ± hirsute with loosely reflexing hairs; internodes 3-4 cm. long. Leaves transversely and broadly oblong, subcordate at the base, subsessile, ± deeply slashed and incise-serrate, curled and rugose, thinly hairy on both faces; laceræ and serratures 2-6 mm. deep; superficies 1.8-2.7 × 2-4 cm. Leaves of the branches smaller, subcordate, deeply and sharply serrate. Spikes oblong, obtuse, tapering slightly; interrupted at the base, 2.5-5.5 cm. long. Bracts setaceous or the lowest pair leafy, ciliated with hairs of 3-4 joints. Pedicels and base of the calyx glabrous, or with an occasional hair of 1-2 joints on both; calyx-teeth ciliate with short hairs of 1-2 joints. Corolla purple, with a few setæ without. Stamens included.

The true Crisped or Curled Mint. Banks of the Wooler Water, Northumberland; Cammach Lane, near Settle. *John Tatham*. There has always been a difficulty in judging the affinities of this Mint. Smith thought it might be a variety of *M. viridis* or *M. piperita*. Bentham and Heinrich Braun made it a variety of *M. aquatica* L. It has the broad leaves, and the long calyx teeth of the last named, but the inflorescence is a spike somewhat resembling that of *M. hircina* Hull, rather than the capitate one of *M. aquatica*. The midrib of the leaves of the main axis has become separated into many bundles of vascular tissue, so that 10-20 slender nerves radiate from the base of the leaf. The pedicels and base of the calyx of the specimen in the Linnean herbarium appear more glabrous than in my specimens, and I have ventured to give the parentage as above.

\*\*\* Inflorescence spicate; leaves stalked; pedicels and base of calyx glabrous.

MENTHA PIPERITA L. Sp. Pl., 576. *M. officinalis* Hull Brit. Fl. i., 127 (1799). *M. piperita officinalis* Sole Menth. Brit., p. 15, t. 7 (1798). Stem erect, simple, or more often branched for two-thirds of its length, with short, ascending branches, reddish, very thinly hairy, more hairy under the nodes, with loosely reflexing hairs (in some counties of Britain somewhat more hairy plants occur); internodes 3-7 cm. long. Leaves lanceolate on wild plants, occasionally a few of the lower ones may be oblong, and a pair or two of the small uppermost ones ovate (on culti-

vated plants, most of the leaves may be ovate-lanceolate), acute, cuneate at the base, or the uppermost ones rounded, sharply serrate, dark green above, with a few scattered hairs, paler beneath with more numerous scattered hairs; superficies 3.5-8 × 1.5-3 cm.; serratures mostly directed forward, 0.25-2 mm. deep. Spikes oblong, obtuse, interrupted at the base, 1-3 of the lowest verticils pedunculate, 3.5-6 cm. long. Bracts lanceolate, thinly pilose and ciliate, about as long as the open flowers, or 1-2 of the lowest pairs large and leafy. Pedicels glabrous, with some stalked glands, purple. Calyx narrowly funnel-shaped, glabrous, very glandular in the furrows; teeth long, subulate, dark purple, rarely green, ciliate with rather long white hairs. Corolla pale purple, glandular, with a few, irregularly scattered, 1-2 jointed hairs without. Stamens included.

*M. piperita* is said by some botanists to be the hybrid *M. aquatica* × *spicata*, and the included stamens and 1-2 pairs of leafy bracts at the base of the spike, as well as the pungent smell, would favour this idea. The tendency of the leaves of cultivated plants to become short and ovate-lanceolate, the distinct petioles, and the hairs on the corolla indicate *M. aquatica*. The glabrous pedicels and base of the calyx, as well as the pungent odour, and warm aromatic flavour indicate *M. spicata*. (Ditch near Boxley, Kent, 1919, R. Dochart, Killin, Mid Perth, 1899, Tigh na Circe Fraoich, near Glenogle Head, Mid Perth, 1905, The Dour Burn, New Aberdour, N. Aberdeen, 1915, *J. Fraser*; Emscote, near Warwick, 1897, *A. B. Jackson*; Middlewick Rifle Ranges, Colchester, 1925, *G. C. Brown*. All the above are the common or typical form, except the last named, which is more hairy.

Var. VULGARIS (Sole). *M. piperita vulgaris* Sole Menth. Brit., p. 19, t. 8 (1798). Stem erect, flexuous, reddish-brown, slightly hairy, much branched, 1-2½ ft. high; branches also flexuous. Leaves ovate, acute, decidedly cuneate at the base (Smith says "shorter [than in *M. piperita*] subelliptic"), petiolate, sharply serrate, with 9-12 serratures on each margin, thinly hairy; superficies 2.5-6 × 1.6-3.3 cm. Spikes shortly oblong, very obtuse, often subcapitate, especially on the branches, 2-2.5 cm. long. Bracts ciliate. Pedicels glabrous. Tube of calyx glabrous, sprinkled with glands; teeth ciliate. Corolla purplish-red. Stamens included.

The above description is drawn up from Sole's figure and partly from his text, which is by no means explicit or full. Watery places about Bath, between Wells and Glastonbury, and Chiltern Bottom, Wilts, *Sole*.

Var. DRUCEANA Briq., var. nov. (1894). *M. affinis* Strail. Stem erect, flexuous, branched, red, very thinly hairy, with short hairs, more numerous under the nodes, 2-2½ ft. high. Leaves varying from oval to ovate, smaller upper ones acute, petiolate, unequal and slightly cuneate at the base, the upper ones rounded at the base, dark green above, thinly hairy at first, soon glabrous above, pale green and thinly hairy on the nerves beneath; serratures 5-10 on each margin, 0.25-1.25 mm. deep, mostly directed forward, and 3-6 mm. apart. Spikes short, obtuse, interrupted at the base, often subcapitate on the branches. Pedicels and

base of calyx glabrous; teeth ciliate. Corolla glabrous within. Stamens included.

The distinguishing features of the variety are the oval leaves of the main axis, slightly *cuneate at the base*, and the small number and small size of the serratures. Didcot, Berks, 1889 and 1891, *G. C. Druce*.

Var. *SUBCORDATA* Fraser, var. nov. Stems erect more or less flexuous, simple or more often branched, thinly and shortly hairy, with the hairs more numerous under the nodes, dark purple-red; internodes 2-7 cm. long, the longer ones due to plentiful moisture; branches ascending, flexuous. Leaves ovate to oblong-ovate on the same plants in different seasons, *subcordate at the base*, the upper ones *truncate or rounded at the base*, petiolate, acute, conspicuously hairy on both sides of the young leaves, but becoming thinly hairy or subglabrous above, thinly and shortly hairy all over beneath or only on the principal nerves; superficies 2-8.5 × 1.5-3.8 cm.; serratures 0.25-2 mm. deep. Spikes shortly oblong, very obtuse, most often interrupted at the base on the main axis; 1-2 of the lowest verticils often pedunculate. Bracts lanceolate, ciliate. Pedicels and base of calyx glabrous, but having stalked glands; teeth of calyx ciliate with 2-4 jointed white hairs. Corolla pale to deep purple, glandular, occasionally having a few, 2-jointed hairs. Stamens included, very rarely exerted on the same plants in different seasons.

This is certainly different from Sole's plant, according to his figure, and Smith's corroboration of the shape of the leaves. The var. *subcordata* is more remote from Sole's type than is var. *Druceana*. Earthcot, Alveston, W. Gloucester, 1921, *William Nelmes*; Mendip near Priddy, 1925, Walton-in-Gordano, 1925, and by the Upper Frome, at Gurney Slade, 1925, all in N. Somerset, *J. W. White*. There is another form of Sole's plant in cultivation, with narrow, oblong leaves and a subcordate base. I have handled it from two or more gardens.

#### B. Inflorescence capitate; leaves stalked.

*MENTHA CITRATA* Ehrh. Beitr. vii., 150 (1792). *M. odorata* Sole Menth. Brit., p. 21, t. 9 (1798). Stem erect, stout, simple or more often branched for two-thirds of its length, with short, sharply ascending branches, sprinkled with a thin scattering of short hairs, more numerous under the nodes, reddish in the early stages, green upwards, 2 ft. high; internodes 3-5 cm. long. Leaves subcordate, the lower obtuse, the rest gradually acute or cuspidate, petiolate, sharply serrate, covered on both faces with short, thinly scattered, adpressed hairs; superficies 3-8 × 2-5.5 cm.; serratures acute or cuspidate, mostly directed forward, often with a small denticle between the larger ones, 0.25-2 mm. deep. Inflorescence capitate, of 1-3 verticils, the lowest or all remote, and the lowest most often pedunculate; top verticil 1.5-1.8 cm. wide. Two lowest pairs of bracts leafy, the rest lanceolate to setose, thinly ciliate, with 10-12 hairs of 1-3 joints. Pedicels glabrous, with stalked glands or having 2-3 hairs of 1-3 joints as on the base of the calyx; calyx narrowly funnel-shaped; teeth long, ciliate with 10-12 hairs of 1-3 joints. Corolla purple showing

a few 1-4 jointed hairs. Stamens included. Whole herb smelling strongly of *Monarda didyma*.

The above was drawn up from cultivated specimens that came originally from the edge of a pond, Northaw, Herts. The plant is more hairy than Smith's description would admit, but the hairs are very inconspicuous on calyx, pedicels and bracts, except under the compound microscope. Old records are edges of rivers and brooks, Cheshire, *Mrs Walmsley*; and Capel-Carey, North Wales, 1772, *Sole*.

MENTHA AQUATICA L. *M. hirsuta* Huds. Fl. Angl., p. 223 (1762). *M. aquatica minor* Sole Menth. Brit. 23, t. 10 (1798). *M. aquatica* L., var. *capitata* Briq. (1894). Stem erect, simple or branched, 6 in. to 3 ft. high, purple-red in exposure, green in shade,  $\pm$  densely hairy or shaggy with white or grey, deflexed hairs; internodes 3-7.5 cm. long. Leaves short, broadly ovate, obtuse, subcordate or rounded at the base, broadest a little above the base, rather shallowly serrate,  $\pm$  densely hairy on both faces, or subtomentose beneath, but less densely hairy in water and in bogs, petiolate; superficies 2.5-6  $\times$  1.5-3.5 cm.; serratures directed forward, 0.25-2 mm. deep, mostly 1 mm. Inflorescence of 1-2 verticils, the lowest remote and often pedunculate; top verticil 2-2.3 cm. across. Lowest 1-2 pairs of bracts leafy, the rest lanceolate or setose, hirsute, with long, 2-6 jointed hairs. Pedicels hirsute, with long recurved white hairs. Calyx and its teeth hirsute with long white loosely ascending hairs. Corolla bright purple, with many white hairs without. Stamens exerted, anthers dark purple.

One of the two common forms of the species well represented in the Linnean herbarium. Easily recognised by its short, broad, subcordate leaves and very broad terminal head of flowers. Very hirsute in its best form, but varies greatly in degree of hairiness in bogs and in water. Basingstoke Canal, Woking, 1925, Thames Banks, Mortlake, 1921 (with scent of *M. citrata*), Wimbledon Common, 1925, Dunsfold Green, 1925, all in Surrey, *J. Fraser*; Snodland, Kent, 1919, *J. Fraser*.

Var. MAJOR Sole Menth. Brit., p. 25, t. 11 (1798). *M. aquatica* L., var. *acuta* H. Braun (1890). *M. aquatica* L., var. *acuta* Briq. (1894). Stem stout, erect, simple or freely branched, with short, ascending branches, usually shortly and thinly hairy, with reflexed hairs, green, 6 in. to 6 ft. high (the latter in hedges, &c.); internodes 3-9 cm. long. Leaves ovate, elliptic or oblong, more or less cuneate or attenuate at the base, or some of the uppermost rounded there, attenuated upwards, acute or subacute, serrate, very thinly hairy with very short hairs on both faces, and long, adpressed pile on the principal nerves beneath, but varying considerably in the degree of hairiness; superficies 3-7.5  $\times$  2-3.7 cm.; serratures very numerous, mostly directed forwards, 0.25-2 mm. deep, but mostly shallow, except in shade. Inflorescence of one large head, 2-2.5 cm. across, and 1-3 others  $\pm$  remote, one or two of the lowest verticils pedunculate. Two or three of the lowest bracts leafy, the rest setose, shortly hairy. Pedicels with short reflexing hairs. Calyx and teeth covered with ascending hairs, sometimes so short (1-2 joints)

as to make them appear subglabrous. Corolla hairy without, pale to deep purple. Stamens exerted.

The most common variety of *M. aquatica* in Surrey, recognisable by its elongated leaves,  $\pm$  cuneate at the base, and the subglabrous character of the whole herb as a rule. *M. aquatica* L., var. *subglabra* Baker could most often be picked out of this variety. The leaves are usually green, but sometimes deep bronzy-purple in dried up mud-pools. R. Ember, E. Molesey, 1925, Virginia Water, 1925, Chiddingfold and Newdigate, 1926, Holmwood Common and Ripley, 1926, &c., all in Surrey, *J. Fraser*; Marston, towards Water Eaton, Oxon, 1885, Wadbister, Zetland, 1924, *G. C. Bruce*; Cannock Chase, Stafford, 1923, *H. W. Daltry*.

Forma CANA Fraser, forma nov. Whole herb much more hairy than the type, the hairs being denser and very much longer, so that the plants look hoary or grey. Leaves densely hairy above, tomentose beneath, with long white adpressed hairs, forming a dense pile on the principal nerves. Pedicels and the whole calyx densely hirsute with white hairs. Fair Oak Lane, Chessington, and waysides north of Chiddingfold, Surrey, 1926, *J. Fraser*.

Var. DENTICULATA H. Braun Ueb. einig. Art. (1890). *M. denticulata* Strail Essai (1887). *M. aquatica* L., var. *lyulina* Briq. (1891). Stem erect, stout, simple or  $\pm$  branched, with short branches, rather thinly hairy, with loosely recurving hairs, 1-2 ft. high; internodes 3-6 cm. long. Leaves broadly ovate, sub-cordate at the base, rather elongated at the point, lower ones obtuse or even rounded, all the rest acute, broadest near the base, green above, varying from thinly hairy on the lower ones to densely hairy on the upper ones, underface grey tomentose; superficies 2-4  $\times$  1.5-4 cm.; starved specimens amongst sand dunes may have the leaves reduced to 1-1.5  $\times$  0.7-1.2 cm.; serratures very numerous, directed forward, rather irregular in size by having small denticles between the larger, triangular, acute, 12-24 on each margin, 0.5-2 mm. deep. Inflorescence of 1-4 verticils, 1-2 of the lowest being pedunculate; apical head 2 cm. across or less.

Compared with *M. aquatica* (*M. hirsuta* Huds.) the most striking feature of the variety is the very numerous, triangular serratures, with intermediate denticles on thriving specimens, such as those from the Isle of Wight, and W. Kent, mentioned in *B.E.C. Rept.*, 616, 1924. The miniature specimens (3 in. high) from Braunton Burrows are simply shaggy with hairs, but the same number, spread over a normal leaf, would have a very different appearance.

Var. NICEËNSIS Briq. Stems  $\pm$  branched, with short ascending branches, thinly hairy near the base, more densely upwards, with short, retrorse hairs, 2-3 ft. high; internodes 3-11 cm. long. Leaves short, broadly ovate, almost deltoid, very convex on the margin, very obtuse, or with a minute cusp to the broad apical tooth, rounded at the base; broadest a little above it, very shallowly crenate-serrate, thinly and shortly hairy on both faces; superficies 2-5  $\times$  2-4 cm.; serratures 0.25-2 mm. deep, but most often under 1 mm., and lying close to the edge of the leaf. Inflorescence of 1-3 verticils, the lowest remote and peduncu-

late; terminal heads about 1.6 cm. across, but these small heads may be numerous on a branched plant.

A river-bank variety, recognisable by the short, obtuse leaves, sub-deltoid and nearly as broad as long, by the long internodes and small heads.

Var. *WEIHEANA* H. Braun Ueb. einig. Art., p. 80 (1890). *M. Weiheana* Opiz. Stem stout, erect, simple or with numerous short branches, thinly and shortly hairy, reddish, 2-3 ft. high; internodes 4-9 cm. long. Leaves large, elongated, broadly ovate, or broadly oblong-ovate, obtuse, or several of the upper pairs acute, all very convex on the margin, rather finely crenate-serrate, rounded at the base, but mostly suddenly and very shortly cuneate, broadest a little above the base, usually pale red, thinly and shortly hairy on both faces, or the lower ones subglabrous; superficies 3-9 × 2-2.5 cm.; serratures acute, directed forward and most often lying close to the margin, often with a small denticle between the larger ones, 0.25-1.5 mm. deep. Inflorescence of one head and 1-2 verticils, one or both remote and pedunculate.

Apparently a river-bank Mint and in its more glabrous forms named *M. aquatica* L., var. *subglabra* Baker. A more hairy plant from Denbigh Hall, Bucks, *G. C. Druce*, was named by Briquet forma *villosa*.

Var. *INCISO-SERRATA* Briq. Les Labiées des Alpes Maritimes, Part I., p. 80 (1891). *M. inciso-serrata* Strail (1887). Stem stout, erect, branched, with short ascending branches, rather densely clothed with closely or loosely deflexed, white hairs, bearded at the nodes, 2-3 ft. high; internodes 3.5-6 cm. long. Leaves ovate to ovate-lanceolate, acute or sub-acuminate, with a long, terminal tooth, sharply incise-serrate, ± cuneate at the base, or the upper ones rounded, light green above and thinly to densely hairy, with long hairs, beneath densely hairy or subtomentose in exposure, but not in shade, feathered with long, adpressed pile on the principal nerves; superficies 3.5-6.5 × 2-3.5 cm.; serratures directed forward, but salient, with very frequently a small denticle between the larger ones, 0.25-2.5 mm. deep. Inflorescence of 1-6 verticils, 1-3 of which go to form the terminal head, the other 1-3 being remote and pedunculate.

The features of the variety are the ovate, elongate, acute leaves, shortly cuneate at the base, and the incised serratures. The length of the inflorescence is notable on strong plants. See *Rep. B.E.C.*, 614, 1924.

Var. *OBSCURA* Wimm. et Grab. Stem erect, stout, ± branched, thinly hairy throughout, with reflexed hairs, 2-3 ft. high; internodes 2-10 cm. long. Leaves ovate, obtuse, suddenly and shortly cuneate at the base, very shallowly serrate or crenate-serrate, very thinly and shortly hairy on both faces, or the lower ones subglabrous on the upper face, convex on the margin, and ciliate with short hairs; superficies 4-6 × 2-3.5 cm.; some of the uppermost leaves and very leafy bracts are very broadly ovate, rounded at the base, subacute, with a superficies of 3.5-5 × 1.5-3.5 cm.; serratures 3-6 on each margin, directed forward, mostly lying very close to the margin, and 0.25-1.5 mm. deep, most of them under 1 mm. Inflorescence of 1-3 verticils, the two lower remote and pedunculate.

A water form, characterised by the long internodes, subglabrous character, obtuse leaves and *very few shallow serratures*.

Var. LOBELIANA Beck. Fl. der Geg. um Frankf. a M. t. 1, p. 222 (1828). Stem erect, *slender* for the species, simple or  $\pm$  branched, subglabrous below, but  $\pm$  densely hairy near the apex with retrorse hairs, 1-2 $\frac{1}{2}$  ft. high, pale red in exposure, green in shade; internodes 2-3 cm. long. Leaves small to medium, elliptic to ovate-elliptic, acute, or the lower ones obtuse, rounded or shortly cuneate at the base, normally green, but liable to acquire red, brown or violet colours in acid soils or muddy ditches, thinly and shortly hairy on both faces, finely and sharply serrate, with frequently a small denticle on the lower side of the larger ones; superficies 2-4  $\times$  1.2-3 cm.; serratures 0.25-2 mm. deep. Inflorescence of 1-5 verticils, 1-2 of which form the terminal head, while the rest are more remote and 1-2 of them usually pedunculate. The calyx looks thinly hairy, but it means that the numerous hairs are very short.

The features of the variety are the slender stems, small, but elongated leaves, numerous small serratures, and usually small capitula, though the terminal one on some plants of a colony may measure 2 cm. across. Additional records to previous ones are Holmwood Common, and Basingstoke Canal, Woking, Surrey, 1926, *J. Fraser*.

Var. ORTMANNIANA H. Braun Ueb. einig. Arten, &c., p. 82 (1890). *M. Ortmanniana* Opiz Natural. xi., 437 (1826). *M. crenato-dentata* Strail. Stem *slender*, erect, flexuous, green, thinly hairy or subglabrous below, but more densely hairy above, with reflexing hairs; internodes 2-6.5 cm. long. Leaves *very small and short*, broadly ovate, the lower ones obtuse, the upper ones acute, very shallowly serrate, rounded at the base, the lower ones thinly and shortly hairy on both faces, the upper ones more decidedly hairy; superficies 2-3.3  $\times$  1.5-2.5 cm.; serratures 0.25-1 mm. deep. Inflorescence of 2-4 verticils, two forming the terminal head, the other 1-2 remote and pedunculate. Whole calyx shortly hairy.

The slender stems, small leaves, with short petioles and very shallow serratures suggest  $\times$  *M. verticillata*, whether seen growing or dried. A fresh record is Bolder Mere, Wiseley, Surrey, 1926, *J. Fraser*.

C. Inflorescence verticillate; pedicels and calyx hairy, leaves large.

$\times$  MENTHA VERTICILLATA L. Syst. Nat. x., p. 1099, Nr. 4 a (1759). (*M. aquatica*  $\times$  *arvensis*.) Stem erect, simple or branched, green, moderately hairy below, densely hairy above, with short deflexed hairs, 2-3 ft. high; internodes 2-9 cm. long, mostly 2-3 cm. Leaves *short*, broadly ovate, sometimes almost deltoid, obtuse or the uppermost 1-2 pairs and the bracts acute, rounded, truncate or subcordate at the base, shortly petiolate, moderately to densely hairy on both faces, rarely subglabrous, serrate; superficies 2-4.5  $\times$  1.5-3.3 cm.; serratures acute or subacute, very numerous, directed forward, 0.25-1.5 mm. deep. Inflorescence verticillate, verticils all separate, or the upper ones crowded and subspicate, or the uppermost three may be so crowded as to pass for *M.*

*paludosa* Sole (though the leaves of that are different in shape). Bracts ovate like the leaves, but gradually decreasing in size till scarcely longer than the flowers. Pedicels with long, recurving hairs, or short and more closely deflexed. Calyx with short or moderately long hairs. Corolla purple, hairy. Stamens included or occasionally exerted.

My specimens of the above represent the common form in Surrey, yet I had not seen anything from elsewhere to match them till I examined the herbarium of Linnaeus, whose specimen fits them. He wrote *verticillata* on the sheet, and afterwards scratched out the name, substituting *sativa*. He published the former name, however, in op. cit. Bolder Mere, Wisley, 1900, R. Wey below Godalming, 1904, Holmwood Common, 1916, Vents Pond, Holmwood Common, 1926, Basingstoke Canal, Woking, 1926, all in Surrey; Thames Banks, Laleham, Middlesex, 1885; by the Thames, Shiplake, Oxon, 1898 (likely to be named *M. paludosa* Sole); meadows, Hurley, Berks, 1888 (good enough to be named *M. sativa* L., var. *subglabra* Baker). With the exception of the last two, the rest are typical  $\times$  *M. verticillata* L.

Var. *RIVALIS* Briq. (1894). (*M. aquatica*  $\times$  *arvensis*.) Stem stout, erect, branched, thinly clothed with deflexed hairs, 1-3 ft. high; internodes 3-7 cm. long. Leaves elliptic, obtuse, narrowed to both ends, sometimes attenuate at the base, broadest about the middle, except one or two of the uppermost pairs, which are more rounded at the base and ovate, thinly and shortly hairy on both faces, or sometimes more obviously hairy, serrate, petiolate, with rather long petioles; superficies 3-7  $\times$  2-4 cm.; serratures mostly directed forward, acute, 9-15 on each margin, and 0.25-1.5 mm. deep. Verticils mostly all remote when they reach the flowering stage. Bracts ovate to ovate-lanceolate, acute, gradually decreasing in size, but longer than the flowers. Pedicels, calyx and calyx teeth hairy as in the type. Corolla purple. Stamens included.

Additions to previous records are Basingstoke Canal, Woking, 1925, Virginia Water, Surrey, 1926, *J. Fraser*; Symond's Yat, W. Gloucester, 1925, *H. J. Riddelsdell*, and *M. L. Wedgwood*. Features of the variety are a strong growing plant, with long, elliptic leaves  $\pm$  attenuate at the base, or some of the uppermost more rounded at the base and inclined to be ovate, as are the shortening bracts.

Var. *OVALIFOLIA* H. Braun in Zoolog.-botanisch. Gesellsch. in Wien (1890). Var. *ovalifolia* Briq. (1894). *M. ovalifolia* Opiz Natural., S. 70 (1824). (*M. aquatica*  $\times$  *arvensis*.) Stem erect, except in water, simple or branched, with short ascending branches, very thinly hairy below, more densely hairy upwards, bearded at the nodes, 2 ft. high or more; internodes 3-8 cm. long, generally 4-6 cm. Leaves broadly oval, medium, large or very large, obtuse, rounded at the base but usually narrowed suddenly to a short wedge at the top of the petiole, acutely serrate, very shortly and thinly hairy or subglabrous on both faces, though the uppermost ones and the bracts may be more decidedly hairy in dry situations; superficies 2.5-5.5  $\times$  1.8-4 cm.; petioles up to 2 cm. long on the lower part of the stem, gradually shorter upwards; serratures directed forward, and mostly near the edge of the leaf, except in water, 0.25-2 mm.

deep, and 5-10 on each margin. Bracts ovate, acute, gradually shorter. Verticils all separate, narrower than the bracts. Stamens included, seldom exerted.

A plant of river banks, ditches, bogs, wet meadows, and places where water has stagnated in winter. Very common and variable in appearance, chiefly in the size of the leaves. Occasionally *M. sativa* L., var. *subglabra* Baker, and *M. paludosa* Sole can be taken out of it by those who care to do so. Fresh records are the R. Mole, E. Molesey, Runnymede, and Dunsfold Green, 1925, Basingstoke Canal, Woking, R. Wey above Newark Mill, waysides south of Chiddingfold, 1926, all in Surrey, *J. Fraser*; banks of the Chew, Compton Dands, N. Somerset, 1925, *J. W. White*.

Var. *CONGESTA* Fraser, var. nov. × *M. verticillata* L., var. *ovalifolia* Briq., forma ad. var. *atrovirentem* vergens (*J. Briquet*, 1894). (*M. aquatica* × *arvensis*.) Stem erect, simple or profusely branched, with widely spreading and ascending branches, stout, shaggy with loosely reflexed, long, grey or white hairs, bearded at the nodes, 1-3 ft. high; internodes 3-9.5 cm. long, usually 3-5 cm. Leaves under dry conditions lanceolate to ovate-lanceolate, obtuse below, acute above, cuneate and sometimes attenuate at the base, sharply serrate, densely hairy above, more so beneath or tomentose, with very conspicuous, adpressed, feathery-looking white pile on the principal nerves; under favourable conditions with an adequate rainfall, the leaves are twice as large, elliptic, ± attenuate at both ends, and less hairy on both faces (this is the case in hedges and under cultivation); superficies 3.5-7.5 × 1.5-3.8 cm.; serratures 8-12 on each margin, mostly directed forward, but occasionally some of them are salient, and concave on the lower side, 0.25-2 mm. deep, mostly 1 mm. and conspicuous. Inflorescence congested, and under dry conditions only 1-2 verticils may be produced, but with adequate moisture there may be 7-10, of which 2-5 may be pedunculate, and the uppermost 3-6 crowded into a spike, hiding the bracts. Pedicels shaggy with 3-5 jointed, deflexed, white hairs; calyx similarly covered with ascending hairs. Corolla purple, very hairy without and in the throat within. Stamens included.

The affinity of this variety is with var. *ovalifolia*, but the leaves are much more attenuated at both ends, as are the bracts and the whole herb vastly more hairy. I fail to see any affinity with var. *atrovirens*. The specimens I have seen named by Briquet, and those in various herbaria are most often the starved type with a very short inflorescence. Localities are Stonebridge, Dorking, 1921, waysides north of Newdigate, 1926, waysides south of Chiddingfold, 1926, *J. Fraser*; near Newdigate, 1900, *C. E. Salmon*, all in Surrey on clay soil; Henfield, W. Sussex, 1911, *E. S. Todd*; Horton, Dorset, *E. S. Marshall*; Tweedside, Peebles, 1909, and Aldermaston, Berks, 1888, *G. C. Druce*.

Forma *LITIGIOSA* E. Malinvaud. Stems and leaves as in var. *congesta*. Malinvaud wrote on the label, "corolla intus villosa, e grege sativum, corolla intus glabra, forma litigiosa." On dissection I find that the throat of the corolla is not absolutely glabrous, though very

nearly so, compared with that of var. *congesta*, which has very numerous hairs. Molton, South Devon, 1896, *G. C. Druce*.

Var. *MOTOLENSIS* (Opiz) in Lotos, iii., p. 208 (1853) Druce. (*M. aquatica* × *arvensis*.) Stem erect, branched, thinly strewed with short, deflexed hairs, often reddish at the base, or for the greater part of its length, 2-3 ft. high; internodes 2.5-13.5 cm. long. Leaves oval-elongated, petiolate, obtusely pointed or cuspidate, rounded at the base, ± decurrent on the petiole, irregularly serrate, thinly strewed with short hairs on both faces; superficies 5.5-6.5 × 3.2-4 cm.; serratures directed forward, acute, 0.25-1 mm. deep. Bracts like the leaves, rapidly decreasing in size, though always longer than the verticils, becoming ovate, acute and more hairy than the leaves. Many of the lower verticils are shortly pedunculate. Bracteoles lanceolate, hairy, ciliate, equalling or shorter than the corolla. Pedicels with rather short, reflexed hairs. Calyx with short, ascending hairs. Corolla hairy. Stamens included.

A tall growing variety of × *M. verticillata*, with very large and long oval leaves, sometimes quite red underneath, and apparently a water form. Wytham Meadows, Berks, 1900, *G. C. Druce*.

Var. *HIRSUTA* Koch. (*M. aquatica* × *arvensis*.) Stem erect, often flexuous, rather thinly hirsute below, very densely hirsute above, with long, loosely deflexed, white hairs, 2-2½ ft. high; internodes 3.5-6 cm. or more. Leaves very large for × *M. verticillata*, broadly ovate, or a few of the lower ones broadly oval, obtuse, ± cuneate at the base, the uppermost pair less so, coarsely serrate, villous on both faces, with long hairs often 1 mm. long or more; superficies 4-6 × 3.5-5 cm.; serratures directed forward, triangular, acute, irregular, often having a small denticle on the lower side of large ones, 0.5-3 mm. deep. Bracts ovate, acute, like the leaves, but rapidly decreasing in size upwards, *very villous on both faces*; and appearing above the last whorl. Pedicels densely hirsute with reflexed white hairs. Calyx villous; teeth subulate, acuminate, long, ciliate with long white hairs. Corolla pale purple, very hairy. Stamens included.

For size of leaf this can be matched by some other forms of × *M. verticillata*, but not for size and depth of serratures. The villous character of the whole herb can be matched by the var. *congesta*, in dry seasons more especially, but the leaves of the latter are very different in shape. By Mynde Park Lake, Herefordshire, 1918, *E. Armitage*. This was labelled *M. sativa* L., var. *pilosa* Spr., but C. Sprengel, in the 2nd edition of *Flora Halensis* (1832) corrected this to *M. aquatica* L. (*M. hirsuta* Sm.).

\* Pedicels and calyx hairy; leaves small.

Var. *ADULTERINA* Briq. (*M. aquatica* × *arvensis*.) Stem weakly amongst rank vegetation, stout in exposure, erect, much branched below the main inflorescence, thinly hairy below, densely so above, 12-18 in. high; internodes 2-7 cm. long. Leaves small to medium, elliptic, taper-

ing to both ends, obtusely pointed, obtusely to acutely serrate, lower ones rather thinly hairy on both faces, upper ones more densely so; superficies 2.5-4.5 × 1-2.5 cm.; serratures rather fine, directed forward, regular 0.25-1 mm. deep. Inflorescence of 7-9 verticils, *very closely arranged* giving a subspicate appearance, generally surmounted by a few pairs of small leaves, but occasionally tipped by a verticil; verticils small, compact, rarely very shortly pedunculate. Bracts like the leaves but gradually shorter till the uppermost 1-2 pairs may be shorter than the corollas. Corolla purple, hairy. Stamens included, or occasionally exerted in dry seasons.

Seems to be confined to various parts of Holmwood Common, in Surrey, on a clay soil. Starved specimens 2-5 in. high have a congested inflorescence, resembling a leafy spike.

Var. LINTONI Briq., var. nov. (1894). (*M. aquatica* × *arvensis*.) Stem about 1 ft. high, apparently simple, subglabrous near the base, thinly and shortly hairy upwards; internodes 1.5-3 cm. long. Lower leaves narrowly ovate-lanceolate, obtuse to subacute, shallowly and acutely serrate, shortly cuneate at the base, thinly and very shortly hairy on both faces; superficies 3-3.5 × 1.5-2 cm.; serratures directed forward, 0.25-0.75 mm. deep. Bracts lanceolate, or subacuminate, more tapered to the base than the leaves; the uppermost scarcely shorter. Verticils all separate, and none amongst the upper leafy bracts. Calyx short, campanulate.

Originally passed through the B.E.C. in 1887, as *M. arvensis* × *sativa*, this variety bears considerable resemblance to a narrow-leaved form of *M. arvensis*, but the calyx teeth are too long for the latter.

Var. TRICHODES Briq. (1894). (*M. aquatica* × *arvensis*.) Stem ± branched, hairy, 1 ft. high or more; internodes 2-4 cm. long. Leaves of medium size, oblong, acute or cuspidate, ± hairy on both faces; superficies 2-3.5 × 1.3-1.5 cm.; serratures varying from triangular, to subulate, acuminate, 0.5-2.5 mm. deep, irregular and distant. Bracts lanceolate, acuminate, with 1-3 sharp or slender teeth on each margin. Verticils all separate.

The long, slender serratures are the feature of this variety. Hereford, G. C. Druce.

Var. CRENATA Briq. *M. crenata* Becker, Rchb. Fl. Germ. Excurs. (*M. aquatica* × *arvensis*.) Stem slender, erect, flexuous, simple, or sparingly branched when crowded, more freely branched, with flexuous, branches where space is adequate, ± covered with long and short, deflexed white hairs, 1½-2½ ft. high; internodes 3-8 cm. long. Leaves of small to medium size, ovate to oval, acute or wholly obtuse, rounded at the base and slightly decurrent on the petiole (including the bracts), convex on the margin, shallowly crenate to finely serrate, ± densely hairy on both faces, with long and short hairs; superficies 2.5-3.5 × 1.8-2.5 cm.; crenatures and serratures 0.25-0.75 mm. deep, directed forward and mostly lying very close to the margin. Verticils sessile, all separate or occasionally with the uppermost ones crowded and subspi-

cate. Bracts becoming very short towards the apex of the stem. Corolla purple, hairy. Stamens included or a few exerted.

The slender, flexuous stems, and the small, crenate lower and shallowly serrate or serrate-crenate upper leaves are the features of the variety. Additional records are Walton-in-Gordano, N. Somerset, 1925, *J. W. White*; Wimbledon Common, Surrey, 1925, *J. Fraser*.

VAR. CAERULEA Briq. (*M. aquatica* × *arvensis*.) Stems fairly stout, much branched, with ascending branches, thinly hairy below and only moderately hairy above, about 18 in. high; internodes 2-6 cm. long. Leaves small, ovate, shortly cuneate at the base, broadest a little above the base, convex on the margin, subglabrous on the lower part of the plant, thinly hairy on both faces towards the top of it, *glaucous beneath*, finely serrate, or many of the smaller leaves shallowly crenate; superficies 2.5-4 × 1.5-2.7 cm.; serratures acute or subacute, directed forward, 0.25-0.75 mm. deep. Bracts gradually smaller upwards. Verticils all separate.

The features of the variety are the much branched stem, the glaucous undersurface of the leaves, and the shallow serratures.

VAR. RUBRO-HIRTA Briq. *M. rubro-hirta* Lej. et Court. (*M. aquatica* × *arvensis*.) Stem erect, straight, simple or branched, with rather long straight branches, covered with long, reflexed hairs above the middle, but thinly hairy below, 16-20 in. high; internodes 3-5 cm. long. Leaves *small, ovate, acute, subcordate* at the base, or slightly decurrent on the petiole, sharply serrate, densely covered with long hairs on both faces; superficies 3-4 × 2-3.5 cm.; serratures directed forward, the lower ones rather obtuse, those on the upper leaves acute, 0.25-1 mm. deep. Lower bracts like the leaves, but soon giving place to very small, triangular, cuspidate ones, and the uppermost ones completely hidden by the flowers. Verticils sessile, the lower remote, the uppermost crowded and subspicate. Pedicels and calyx covered with long, spreading hairs, the base of the calyx very hairy. Corolla purple, hairy. Stamens included.

Hairy stems, small ovate or subdeltoid, sharply serrate, very hairy leaves, the upper verticils crowded into a spike, and the very small bracts are the features of the variety.

VAR. BENESCHIANA (Opiz). *M. Beneschiana* Opiz, ex Déségl. in Bull. Soc. Sc. Angers 206 (1882). (*M. aquatica* × *arvensis*.) Stem erect, flexuous, simple or slightly branched, reddish below, brown above, and thinly strewed with hairs; 16-20 in. high; internodes 2-4.5 cm. long. Leaves small to medium in size, oval, acute, thinly strewed with short and long hairs on both faces, ± decurrent on the short petiole, serrate; superficies 3.5-4 × 2-2.5 cm.; serratures equal, directed forward, acute, 0.25-0.75 mm. deep. Verticils all or mostly all shortly pedunculate to the apex of the stem, all separate. Bracts like the leaves but gradually shortening to the top of the axis. Bracteoles lanceolate, about as long as the calyx. Pedicels purple and covered with reflexed hairs of short or medium length. Calyx thinly covered with short, ascending hairs, teeth brown. Corolla pale purple, hairy. Stamens included.

The small, oval, acute leaves, decurrent on the petiole, the pedunculate verticils, and the short hairs on the calyx are the main features of the variety. Port Meadow, Oxford, 1886, *G. C. Druce*.

\*\* Pedicels and calyx hairy; leaves twice as long as broad.

Var. ACUTIFOLIA (Sm.) Fraser. *M. acutifolia* Sm. in Trans. Linn. Soc. Vol. v., 203 (1800). (*M. aquatica* × *arvensis*.) Stem erect, simple, or ± freely branched according to circumstances or environment, very thinly and shortly hairy below or subglabrous, more densely hairy on the axis of the inflorescence, with short, closely deflexed hairs, 2 ft. high; internodes 2-5 cm. long. Leaves lanceolate, or ovate-lanceolate, acute at both ends, shortly petiolate, unequally serrate, but entire at both ends. Verticils numerous, sessile, equalling or almost equalling the petioles, many flowered. Bracts like the leaves but gradually shortening upwards. Bracteoles linear-lanceolate or subulate. Pedicels hispid with horizontally patent hairs, variable in length, often recurved. Calyx tubular, thinly and shortly hairy on all sides, especially at the base, with ascending hairs. Corolla purple, thinly hairy without and in the throat. Stamens included.

The above is very nearly Smith's original description, loc. cit., but while keeping close to it I doubt if the verticils are always sessile even in wild specimens. He laid most stress on the horizontally spreading hairs on the pedicels for his species, but that and almost every other character are controverted by one or other colony on the Medway. He quotes Isaac Rand (Chelsea Physic Garden), as having observed it on the side of the River Medway, Kent, but I have a specimen collected by Rand and Buddle on the Medway that has its pedicels densely hirsute with long white hairs pointing in a variety of ways. Of course, Smith had only seen two specimens, from which he drew up his description, and was somewhat doubtful as to its being a distinct species. Specimens very close to Smith's type were gathered by the R. Medway, Nettlestead and below Yalding, W. Kent, 1919, J. Fraser. At the last named place the main axis sometimes ends in 1-2 verticils forming a capitulum but this does not controvert Smith's plate in Eng. Bot. ed. 2, t. 809, except that the capitulum in the plate is subtended by long bracts, which in my specimen are lanceolate and shorter than the flowers. The capitulum is only occasional on wild or cultivated plants.

Forma HIRSUTIPES Fraser. Leaves lanceolate, obtusely pointed, 5-5.5 × 1.7-2.2 cm. Pedicels hirsute with long white hairs of 3-4 joints, most of them recurved from the middle or below it, some ascending and only a few spreading horizontally. Base of calyx similarly hirsute. Collected by the R. Medway by Isaac Rand and Buddle, between 1724 and 1743.

Forma ALBIFLORA Fraser. Stems erect, branched, very profusely in cultivation. Leaves lanceolate or ovate-lanceolate, broadest in cultivation, the lower obtuse, the upper and the bracts acute, subglabrous; superficies 4-8 × 2-3.5 cm.; serratures rather fine, not altered by cultivation. Verticils all separate, ten out of twelve shortly pedunculate. Pedi-

cels purple, covered with very short 1-2 rarely 3 jointed hairs. Calyx with very short ascending hairs, conspicuously glandular. Flowers white. R. Medway, East Barming and Watlingbury, W. Kent, 1919, *J. Fraser* at three stations. This comes very close to Smith's type, except in the colour of the flowers.

Forma *PLICATA* Fraser. Leaves ovate-lanceolate, the lower obtuse, the upper acute, dark green, strongly *ridged and furrowed or plicate* along the main lateral veins, rather more hairy than usual. Bracts lanceolate or ovate, gradually shortening. Verticils all separate, most of them shortly pedunculate, or in some seasons the axis is terminated by a capitulum of 1-2 verticils. Pedicels with rather long, widely recurving hairs, and base of calyx more hirsute than usual. R. Medway, Nettlestead, W. Kent, 1919, *J. Fraser*.

Forma *DEFLEXA* Fraser. Leaves ovate-lanceolate, acute or acuminate, rather more coarsely serrate than usual, though not more deeply than 1 mm., with rather longer pilose hairs than usual on the principal nerves beneath. Verticils all separate, often shortly pedunculate. Pedicels covered with short, 1-2 jointed, *closely deflexed or retrorse hairs*. Base of calyx hirsute with similar spreading and deflexed hairs. Bank of R. Medway, Yalding, W. Kent, 1919, *J. Fraser*.

Var. *DUBIA* Fraser. (*M. aquatica* × *arvensis*.) Stem erect, simple or slightly branched in the wild state, when crowded, but branched from the base upwards in cultivation, the primary and secondary branches flowering, thinly and shortly hairy below, densely so above, with loosely arching hairs, more closely reflexed towards the apex, 1-2 ft. high; internodes 2-9 cm. long. Leaves ovate-elliptic obtuse, tapering much to the apex, cuneate at the base, sharply serrate, thinly and shortly hairy on both faces, very convex a little below the middle; superficies 3-6.5 × 1.5-3.5 cm.; serratures 4-8 rarely 9 on each margin, directed forward, 0.25-1 mm. deep. Bracts similar to the leaves, gradually shorter, subacute to acute, the lower ones with long petioles (up to 1.5 cm.). Bracteoles lanceolate, about equalling the corolla. Inflorescence of 8-12 verticils, the lower shortly pedunculate, and not equalling the petioles, the upper sessile and wider than the petioles. Pedicels with few, many or no hairs, which are short, declining, or longer and arching widely. Calyx with short ascending hairs; teeth triangular, with rather long cilia. Corolla pale purple, hairy. Stamens partly exerted early in the season, but included later in the season.

This variety is closely related to *M. rhomboidea* Strail (1887), but the upper bracts (leaves of Strail) are not lanceolate-rhomboid, being shorter and more nearly ovate. Strail's plant also has more hairy stems, leaves and pedicels and deeply toothed leaves. It is also allied to *M. acutifolia* Sm., but the leaves are not twice as long as broad.

\*\*\* Pedicels and calyx-tube glabrous.

× *MENTHA RUBRA* Sm. Trans. Linn. Soc. v., p. 205 (1800). *M. rubra* Huds., var. *laevifolia* Briq. (1894). (*M. verticillata* × *spicata*.) Stem stout,

erect, flexuous, purple, simple or branched below the inflorescence, glabrous or occasionally with a few hairs under the nodes, 2-5 ft. high; internodes 2-6 cm. long. Leaves broadly to narrowly ovate, obtuse or occasionally acute, rounded at the base or occasionally shortly cuneate, shortly petiolate, glabrous or having a few very short inconspicuous hairs on both faces, especially when young and only partly developed, rather coarsely serrate; superficies 3-6 × 2-3.5 cm.; serratures triangular, directed forward, acute, 0.5-3 mm. deep, with an occasional denticle on the lower side. Bracts as large as the leaves when growing in water, those on drier ground *subrotund, cuspidate*, or 1-2 lowest pairs ovate; superficies 1-4 × 1-3.5 cm. on firm ground; in water 6 × 3-4 cm. Some of the lower verticils are shortly pedunculate. Calyx long, tubular, glandular, glabrous; teeth thinly ciliate with 1-3 jointed hairs. Pedicels glabrous. Bracteoles linear to setaceous, tips thinly ciliate with 1-3 jointed hairs. Corolla purple, large, glandular, glabrous. Stamens ± exserted.

Localities given in *Rep. B.E.C.* 1924, p. 623.

Var. *RARIPILO* Briq. (1894). (*M. verticillata* × *spicata*.) Stem erect, flexuous, stout, simple or branched under the inflorescence, ± hairy, with short hairs, more numerous at the nodes, 1-5 ft. high, purple; internodes 2-6 cm. long. Leaves ovate, obtuse, seldom subacute, shortly petiolate, rounded at the base, occasionally shortly cuneate, ± *pilose on both faces*; superficies 3-6 × 1.5-3.5 cm.; serratures as in the type. Bracts small, *ovate, acute*, finely serrate, gradually shortening till the uppermost are shorter than the flowers, giving the inflorescence a subsperate appearance. Calyx-teeth rather more conspicuously ciliate than in the type, with 1-3 jointed hairs. Stamens frequently perfect and exserted.

Additional record to the *Report* is stream near Colbourne Station, Isle of Wight, 1894, *J. H. A. Stewart*.

Var. *DRUCEI* Briq. (1894). (*M. verticillata* × *spicata*.) Stem erect, flexuous, very thinly hairy below, more obviously hairy above, with short hairs, 2-3 ft. high, with a few branches above; internodes 2.5-7 cm. long. Leaves oval, acute, ± cuneate at the base, minutely hairy on the midrib above, thinly pilose on the nerves beneath; serratures 3-12 on each margin, acute, 0.75-1 mm. deep; petioles 7-13 mm. long. Bracts ovate, acute or acuminate, 8-16 mm. long. Calyx short, broad, campanulate, glabrous, conspicuously lined with glands between the ribs; teeth ciliate.

The features of the variety are the *oval, acute, finely serrate leaves, long petioles, small, ovate bracts and short, campanulate calyx*.

Var. *CALLEMORPHA* Briq. (1894). (*M. verticillata* × *spicata*.) Stem erect, simple or branched under the inflorescence, red, very shortly and thinly hairy, 2-4 ft. high. Leaves oblong to oval, shortly petiolate, suddenly pointed, obtuse or acute, dark green above, paler beneath, thinly hairy on both faces; superficies 2-6 × 1.5-3 cm.; serratures directed forward, acute or subacute, numerous, regular, 0.25-2 mm. deep. Bracts *large, ovate*, decreasing very gradually from 3.5-1.8 cm. in length at the eighth verticil, with full sized serratures. Calyx *short, campanulate*, glabrous; teeth ciliate. Pedicels glabrous.

The *large*, ovate bracts and the *short*, *campanulate calyx* are the features of the variety, which verges towards the sub-species *Wirtgeniana* F. Schultz.

**MENTHA GENTILIS** L. (*M. arvensis* × *spicata*.) Stem erect, thinly hairy below, more densely so above, reddish-purple, 12-18 in. high, simple or more often profusely branched from near the base to the inflorescence; internodes 2-5 cm. long. Leaves narrowly ovate to ovate-lanceolate, acute or ± attenuate at the apex, and at the base, or the uppermost true leaves rounded at the base, sharply serrate, thinly and shortly hairy on both faces, but variable and sometimes showing longer pile on the principal nerves beneath; superficies 3.5-6 × 1.5-2.3 cm.; serratures directed forward, 0.25-0.75 mm. deep. Primordial leaves larger, oval or oblong oval, obtuse and very shallowly serrate. Leafy bracts ovate, more rounded at the base than the leaves, with a long, entire point, gradually shortening upwards, and always exceeding the verticils. Several of the lower verticils are pedunculate. Pedicels and base of the campanulate calyx glabrous; or on some plants, a few hairs may run down to the middle of the tube. Calyx teeth ciliate with long white hairs of 3-6 joints. Corolla pale purple. Stamens included.

Waste ground, Swanage, Dorset, 1915, *C. B. Green*.

Var. **VARIEGATA** Sm. Trans. Linn. Soc. Vol. v., p. 208 (1800). Sole Menth. Brit. 43, t. 19. (*M. arvensis* × *spicata*.) Leaves similar to the type, but sometimes smaller, irregularly striped and splashed with yellow along the principal nerves.

Barnes Common, Surrey, 1912, *J. Fraser*.

Var. **WIRTGENIANA** (F. Schultz). (*M. arvensis* × *spicata*.) Stem erect, 1½-2 ft. high, red, ± branched from the middle to the inflorescence, sometimes *glabrous*, except just under the nodes, in other plants thinly and shortly hairy with closely deflexed hairs from the middle upwards; internodes 2-6 cm. long. Leaves ovate-lanceolate, obtuse to acute, mostly shortly decurrent on the short petioles, thinly and very shortly hairy on both faces; superficies 3-4.5 × 1.5-2.5 cm.; serratures directed forward, ± triangular, acute, irregular, 0.25-1.25 mm. deep. Leafy bracts very much smaller than in the type, ovate-lanceolate, gradually becoming shorter, but always exceeding the verticils. All the verticils are very small, and one or two of the lowest may be pedunculate, whether wild or cultivated. Pedicels glabrous. Base of the campanulate calyx glabrous strewed with large glands; calyx-teeth very *shortly ciliate with 1-3 jointed hairs*. Corolla small, pale to bright purple. Stamens included.

Symond's Yat, 1925, *H. J. Riddelsdell* and *M. L. Wedgwood*.

Var. **RESINOSA** Briq. (1894). *M. resinosa* Opiz. (*M. arvensis* × *spicata*.) Stem erect 1½-2 ft. high, ± branched, subglabrous below, thinly hairy upwards, internodes 2.5-5 cm. long. Leaves elliptic, acute or shortly acuminate, narrowed at both ends, thinly hairy on both faces, *incise-serrate*, shortly petiolate; superficies 3-5 × 1.5-2.5 cm.; serratures *triangular-subulate*, acute, directed forward, 1-3 mm. deep. Bracts

similar in size and in serratures to those of the leaves and only a little smaller at the apex of the inflorescence.

The *incise-serrate leaves and bracts* are the features of the variety.

Var. PAULIANA (F. Schultz) in Jahresber. d. Pollichia, 12, 1854, p. 31, 40 and 41. (*M. arvensis* × *spicata*.) Stem 1½-2 ft. high, *glabrous or subglabrous*, often red, branched about the middle, with ascending branches 10-15 cm. long; internodes moderate. Leaves elliptic to oval, more tapered to the base than the apex, serrate, with a large, entire apical tooth, glabrous above or with a few short scattered hairs, pilose on the principal nerves beneath, or occasionally with a few hairs all over; superficies 2.5-5 × 1-2.5 cm.; serratures 5-7 on each margin, directed forward, and acute to subacute. Bracts elliptic, similar to the leaves but *gradually smaller*, a little more hairy, and the serratures more acute. Pedicels and base of the calyx glabrous; calyx teeth ciliate with *numerous long, grey hairs*. Very often many of the lower verticils are pedunculate.

No British specimens seen. The description is drawn up from two sheets, with four specimens, in the Kew Herbarium. The variety differs from the type by the *glabrous or subglabrous stems*, and from the var. *Wirtgeniana* by the *long hairs on the calyx-teeth*.

Var. GRATA Briq. (1894). *M. grata* Host. (*M. arvensis* × *spicata*.) Stem erect, simple or slightly branched, thinly hairy with short hairs, red, slender, 12-15 in. high; internodes 2-3 cm. long. Leaves small, lanceolate, to ovate or elliptic, thinly hairy on both faces, with short, adpressed hairs, finely and closely serrate; superficies 2-3 × 1-1.9 cm.; serratures acute, directed forward, 0.25-1 mm. deep. Bracts similar to the leaves, gradually decreasing in size, but always longer than the corolla, and a few of the uppermost pairs have no flowers in their axils. Pedicels and base of the calyx glabrous; calyx-teeth moderately hairy, and ciliate with 1-3 rarely 4-jointed hairs. Corolla pale to bright rose-purple. Stamens included. Some of the lower verticils are shortly pedunculate.

The *short, slender stems, small leaves and bracts and fine serratures* are features of the variety. See *Rep. B.E.C.* 1924, p. 624 for localities.

Var. PRATENSIS (Sole) Menth. Brit., p. 39, t. 17. (*M. arvensis* × *spicata*.) Stem erect, simple or branched under the inflorescence, with short ascending flowering branches, hirsute, pale green, becoming brown, 2-3 ft. high. Leaves narrowly oval or elliptic, obtuse, narrowed to both ends, cuneate at the base, sharply serrate, shortly petiolate, rugose, leathery, hirsute, sharply deflexed on the main axis; superficies 4.5-5 × 1.5-2 cm.; serratures directed forward, 0.5-1 mm. deep. Bracts short gradually shortening upwards, but always slightly exceeding the flowers, and apparently shorter than those of *M. cardiaca*, ovate-lanceolate, acute. Verticils all separate, larger or smaller. Pedicels and base of the calyx glabrous; calyx-teeth ciliate. Corolla purple-blue. Stamens included.

No recent specimens seen. Sole says this plant has the smell of Peppermint. The inflorescence recalls that of *M. cardiaca* Baker. Alderbury Common, New Forest, Wilts, 1789, *Sole*.

VAR. GRACILIS (Sm.) Fraser. *M. gracilis* Sm. Trans. Linn. Soc. v., p. 210 (1800). *M. gracilis* Sole Menth. Brit., p. 37, t. 16 (1798). (*M. arvensis* × *gentilis*.) Stem erect, with ± numerous, short, ascending branches about the middle parts, thinly hairy, with short, closely deflexed hairs (Smith says scabrous, but that must be where most of the hairs fall off), reddish in exposure, green where shaded, 12-18 in. high or more; internodes 3.5-7.5 cm. long. Leaves lanceolate, occasionally ovate-lanceolate on the same stem, acute or shortly acuminate, with a long entire point, distinctly cuneate at the base, acutely serrate, very shortly petiolate, very thinly sprinkled with short adpressed hairs above, more hairy beneath, especially on the principal nerves, which are adpressed pilose, bright green; superficies 4.5-5.5 × 1.2-2.2 cm.; serratures directed forward, 1-2 mm. deep. Bracts similar to the leaves, gradually shorter, but always exceeding the flowers, and more hairy. One or two of the lower verticils are shortly pedunculate, the rest sessile. Bracteoles lanceolate to linear, shorter than the flowers, hirsute and ciliate. Pedicels and base of campanulate calyx glabrous; calyx-teeth ciliate with white hairs of 5-6 joints. Corolla pale purple. Stamens included.

Occasionally there are a few hairs near the base of the calyx, with some pin-headed glands on the pedicels; but I have failed to find that the apex of the corolla is bearded, as Smith says. Banks of R. Wye, Great Doward, Herefordshire, 1906, *Augustin Ley*, ex herb. *A. B. Jackson*; Haseley Common, Warwickshire, 1906, *H. S. Bickham*.

VAR. CARDIACA (Baker) Briq. (1894). *M. gracilis* Sm., var. *cardiaca* (Baker). *M. cardiaca* Ger. em. 680, ex icone. (*M. arvensis* × *gentilis*.) Stem erect, stout or slender, usually very much branched from a little above the base, with short or long, ascending, floriferous branches, glabrous or with a few hairs at some of the nodes, and occasionally near the top, reddish in exposure; internodes 3-6 cm. long. Leaves varying from oblong to ovate-lanceolate and lanceolate, the lower obtuse, the upper acute, with an entire point, sharply serrate, rounded at the base or ± cuneate, subglabrous above, with a scattered few, very short adpressed hairs, rather more numerous beneath, but altogether subglabrous; superficies 3-6 × 1-2 cm.; serratures directed forward, 0.5-2 mm. deep (mostly 1 mm.). Primordial leaves shorter, broader, more obtuse or even rounded at the ends, sub-glabrous, very shallowly serrate. Bracts lanceolate or ovate-lanceolate, much shorter than the leaves but variable, and not always conforming closely to Gerard's figure, especially under cultivation. Some of the lower verticils are shortly pedunculate, whether wild or cultivated, all shortly separated. Pedicels glabrous. Calyx glabrous, but very glandular at the base, campanulate; teeth ciliate with very numerous, 3-6 jointed hairs. Corolla purple. Stamens included.

The leaves and bracts vary considerably in different seasons in the same locality according to the rainfall. Seven Stars Inn, Ripley, 1901, Fair Oak Lane, Oxshot, 1925, Woking, 1925, all in Surrey, *J. Fraser*.

A form occurred in Fair Oak Lane, with much more hairy stems, unusually narrow, deeply serrate, hairy, lanceolate leaves, more hairy bracts and calyx teeth, with shorter hairs right to the base of the calyx. No more of it appeared the following year, and the question arises whether or not these hairy forms are partial reversions to the *M. arvensis* parent.

\*\*\*\* Calyx teeth short, *M. arvensis*, type.

*MENTHA ARVENSIS* L. Sp. Pl. 806 (1753). Stem erect or diffuse, according to environment, simple or more often branched from the base upwards, with short or long, ascending branches,  $\pm$  densely hairy, or thinly so in shade, with loosely or closely deflexed hairs, 3 in. to 1 ft. high; internodes 1-4.5 cm. long. Leaves elliptic, narrowed to both ends, cuneate at the base, often ovate in clay soils and rounded at the base (primordial ones often suborbicular and rounded at both ends),  $\pm$  densely hairy on both faces, or thinly hairy in water and in shade, obtuse or the uppermost obtusely pointed to acute, obtusely serrate to crenate, always entire at the base; superficies 2.5-4  $\times$  1-2.7 cm.; serratures directed forward, sometimes prominent but never incised, 0.25-1 mm. deep. Verticils always separate, mostly sessile, but occasionally a few of the lower ones may be shortly pedunculate. Bracts like the leaves, but gradually shorter, more acute and a few pairs terminate the stem. Bracteoles lanceolate, hairy like the leaves. Pedicels glabrous or occasionally with a few hairs, often purple. Calyx campanulate, short, purple in exposure, covered with patent hairs on all sides, but the hairs may vary in number and length like the rest of the plant. Calyx teeth subulate or triangular acuminate, ciliate with 2-5 joined hairs. Corolla purple  $\pm$  hairy without. Stamens mostly exerted, though they may be  $\pm$  included late in the season.

The above description is largely derived from the specimen (a good one) in the herbarium of Linnaeus with the Linnean Society, and must therefore stand as the type. The triangular acute or acuminate calyx-teeth places the type amongst the long-toothed forms of the species. Virginia Water, 1883, Ashted Common, 1919, Dunsfold Green, 1925, Barwell Court, Chessington, 1926, Richmond Park, 1926, Cooper's Hill, Runnymede, 1926, Holmwood Common, 1926, all in Surrey, *J. Fraser*; Bledington, Oxon, 1926, *M. L. Wedgwood*.

Forma *ALBIFLORA* Fraser. Calyx green. Corolla white. Walton Bridge, Surrey, 1917, *J. Fraser*.

Forma *HIRTIPES* Fraser. Pedicels  $\pm$  densely hairy, with long, deflexed or recurved white hairs. The calyx and corolla are usually very hairy also in conformity with the rest of the plant. Cooper's Hill, Runnymede, 1926, Fair Oak Lane, 1926, Surrey, *J. Fraser*; Beaconsfield, Bucks, 1926, *M. L. Wedgwood*.

Forma *ANGUSTIFOLIA* Fraser. *M. arvensis* L., var. *austriaca* Briq. Forma ad var. *cuneifoliam vergens* (Briquet, 1894). Stem erect, simple or profusely branched according to environment. Leaves lanceolate to elliptic and oblong-elliptic, according to soil, moisture and vigour, much

more attenuate at both ends than in the type, with long, entire base and apex, hairy on both faces, more thinly so in cultivation; superficies 3-6.5  $\times$  1-2.5 cm. Bracts similar to the leaves, gradually shorter and always acute.

Thames banks opposite Kingston, Middlesex, 1904, Barrowgreen Woods; Oxted, Surrey, 1916, Thames banks, Old Windsor, Berks, 1917, Holmwood Common and waysides south of Chiddingfold, Surrey, 1926, *J. Fraser*. The specimens from Old Windsor had uncommonly narrow leaves, but in the fifth year of cultivation they came more in line with the others for width, while retaining their attenuation.

Var. *BREVIDENS* Fraser, var. nov. Stem erect, simple or  $\pm$  profusely branched, hirsute with rather loosely deflexed hairs, 6-15 in. high; internodes 2-4 cm. long. Leaves elliptic, obtuse, cuneate and entire at the base, sometimes attenuate on the same stems, serrate, shortly petiolate, moderately to densely hairy on both faces, according to surroundings; superficies 2.5-5.5  $\times$  1.3-2.3 cm.; serratures directed forward, obtuse to subacute, often very shallow and lying close to the margin, 0.25-1.25 mm. deep. Bracts similar to the leaves, but sometimes larger, and very gradually decreasing in size, obtuse. Verticils small, globular, compact, especially after the corollas have dropped, apparently all sessile. Pedicels hairy with deflexed hairs. Calyx very hairy; teeth *triangular, obtuse, short*, ciliate with 2-5 jointed hairs.

The above is rather a strong-growing plant, and the leaves sometimes resemble those of *M. arvensis* f. *angustifolia*, but the short, blunt calyx-teeth are an important distinction. Barwell Court, Chessington, 1916, Cooper's Hill, Runnymede, Surrey, 1926, *J. Fraser*.

Var. *AGRESTIS* (Sole) Menth. Brit., p. 33, t. 14 (1798). *M. Scribae* F. Schultz in Flora Regensburg, Jan., 1873. *M. arvensis* L., var. *Scribae* Briq. (1894). Stem erect, simple or freely branched from the base, hirsute with deflexed hairs; internodes 2-6 cm. long. Leaves large, dark green, *roundly ovate to suborbicular*, rounded at the end, crenate to obtusely dentate, broadly rounded at the base or occasionally slightly decurrent on the *short* petiole, *strongly ribbed, rugose* (when fresh), hairy on both faces; superficies 2-4.5  $\times$  2-3.2 cm.; crenatures or teeth 0.25-1.5 mm. deep. Bracts similar to the leaves, sometimes larger, decreasing in size till they get very small at the apex of the stem, where they are *sessile or subsessile*. Verticils apparently always sessile. Pedicels hairy, with spreading, recurving or deflexed hairs. Calyx shaggy with white hairs; teeth subulate, acuminate, long for the species, ciliate with 3-6 jointed hairs. Corolla purple, very hairy. Stamens exerted.

Holmwood Common, 1917, and woods near Newdigate, Surrey, 1926, *J. Fraser*. A very striking variety, readily recognised by its broad, *suborbicular, rugose* leaves.

Var. *DENSIFOLIATA* Briq. (1894). Stem erect, simple or profusely branched from the base, diffuse in watery ditches, with spreading and ascending branches  $\pm$  densely hairy; internodes 1.5-5 cm. long, usually about 3 cm. Leaves broadly ovate, obtuse, *broadest and rounded at the base*,  $\pm$  densely hairy on both faces, or much less hairy in water, some-

times slightly decurrent on the petiole, crenate to obtusely serrate, occasionally acutely serrate, making a dense leafy plant; superficies 2-4 × 1.5-2.5 cm.; crenatures and serratures 7-11 on each margin, directed forward, lying close to the margin, 0.25-0.75 mm. deep. Bracts similar to the leaves, and sometimes larger, very gradually smaller, as a rule, and the uppermost 2-5 pairs without flowers. Pedicels hirsute with 2-5 jointed hairs; teeth triangular, acuminate, and ciliate with 2-5 jointed hairs. Corolla purple, very hairy. Stamens usually exerted.

The broadly ovate leaves, broadest and rounded at the base, and the densely leafy plant are the features of the variety. Additional record to *Rep. B.E.C.* 1924, p. 626, Richmond Park, Surrey, 1926, *J. Fraser*.

Var. NUMMULARIA (Schreb.). Stem diffuse, slender, flexuous, ascending or erect in the upper part, with short, closely deflexed hairs, reddish or green, according to environment, 3-12 in. long; internodes 1.5-5 cm. long. Leaves elliptic to ovate, oval and suborbicular, obtuse or rounded at the apex, to subacute in the case of the longer uppermost ones, very shallowly crenate to serrate, attenuate at the base or only slightly decurrent on the petioles, very thinly and shortly hairy on both faces, that is subglabrous; superficies 1.3-4 × 1-2.3 cm.; crenatures and serratures 4-7 on each margin, directed forward, lying close to the margin, 0.25-0.5 mm. deep. Verticils mostly sessile, but 1-3 may be shortly pedunculate. Bracts like the leaves, gradually smaller upwards, with no flowers amongst the uppermost 2-4 pairs. Pedicels glabrous. Calyx short, campanulate, covered with short ascending hairs; teeth triangular, acute, or acuminate, ciliate with 1-3 rarely 4-5 jointed hairs in the more hairy plants of dry situations. Corolla bright rose-purple, hairy without. Seeds abundantly produced. Stamens exerted.

The small, shallowly crenate or serrate leaves, feeble and flexuous stems and bright flowers are marks of this variety. Banks of Thames opposite Surbiton, Middlesex side, 1914, opposite Kingston, Middlesex side, 1917; Richmond Park, Surrey, 1926, *J. Fraser*.

Var. OBTUSIFOLIA Briq. (1894). Stem erect, or diffuse when growing strongly, and flexuous as are the long branches, thinly hairy or subglabrous below, more hairy upwards, with short closely deflexed hairs, 6-20 in. long; internodes 1.5-6 cm. long. Leaves broadly oval, obtuse, suddenly narrowed to a large triangular obtuse tooth, very convex on the margin, thinly and shortly hairy to sub-glabrous on both faces, the younger undeveloped ones more obviously hairy, ± decurrent on the petiole; superficies 2-6 × 1.2-3 cm., the larger sizes in cultivation; serratures directed forward, rather acute, 4-7 on each margin, 0.25-1 mm. deep; petioles 1-1.5 cm. long. Bracts as large as the leaves, decreasing very little in size; bracteoles lanceolate, the lower ones deflexed and longer than the flowers. Verticils sessile or 1-2 very shortly pedunculate. Pedicels usually glabrous, but sometimes thinly hairy. Calyx thinly or densely covered with short, ascending hairs; teeth triangular acute, but shorter than in *arvensis*, ciliate with 1-3 rarely 4-jointed hairs. Corolla pale purple. Stamens exerted.

The broadly oval, obtuse leaves, with very convex margin and the thin scattering of short hairs are the features of the variety. The affinity is with the var. *Allionii*, but the leaves are much broader and less tapered to either end whether in the wild or cultivated state. An additional record is River Ericht, Blairgowrie, Perthshire, 1925, *E. S. Todd*.

Var. *ALLIONI* Briq. (1894). *M. Allionii* Boreau. Stem 6 in. high and erect, or 12-18 in. long and ascending or diffuse, with long  $\pm$  flexuous branches, thinly hairy below or subglabrous, more hairy upwards; internodes 1.5-7 cm. long. Leaves elliptic obtuse to subacute, broadest about the middle, *equally tapered to both ends*, with a long, entire base, very thinly and *shortly hairy* or subglabrous on both faces, finely crenate to crenate-serrate; superficies 3-4  $\times$  1.5-3 cm.; crenatures and serratures directed forward, the latter subacute, 0.25-1 mm. deep, 8-14 on each margin. Bracts similar to the leaves, as large, and but little smaller at the top. Verticils 8-15, mostly sessile. Pedicels glabrous. Calyx campanulate, thinly covered with short, ascending, 1-3 jointed hairs; teeth *short, triangular, acute*, thinly ciliate with 1-3 jointed hairs. Corolla pale purple, hairy. Stamens included.

Elliptic, subglabrous leaves, and short calyx-teeth are characteristic of the variety. Briquet admits as forms plants with a more hairy calyx and  $\pm$  hairy pedicels. In such cases the pedicels have deflexed hairs of 1-3 joints, the calyx-teeth similar ascending hairs, and the calyx-tube 3-5 jointed hairs, which are longer rather than more numerous. For records see *Rep. B.E.C.* 1924, p. 625.

Var. *PRÆCOX* (Sole) Menth. Brit., p. 31, t. 13 (1798). Smith Trans. Linn. Soc. v., p. 213 (1800). *M. arvensis* L.  $\gamma$  *M. præcox*. Stem *erect*, simple or branched, with the branches 1-7 in. long, pale green, thinly covered with *very short closely deflexed* hairs, 6-16 in. high; internodes 2-4.5 cm. long. Leaves *elliptic*, or occasionally a few of them oval or oblong *obtuse*,  $\pm$  attenuate at the base, petiolate, very thinly hairy on both faces, with very short hairs, that is, subglabrous, crenate to shallowly serrate; superficies 3.5-6  $\times$  1.8-2.3 cm.; crenatures and serratures 0.25-0.5 mm. deep, directed forward. Verticils 4-8 towards the top of the stem, a few of the lowest *sometimes* shortly pedunculate. Bracts similar to the leaves, gradually smaller, with a few terminating the stem, and the uppermost acute. The larger bracteoles are lanceolate, and longer or shorter than the flowers. Pedicels glabrous. Calyx-tube thinly covered with ascending hairs of 1-2 rarely 3 joints; teeth triangular, acuminate, rather long for the species, thinly ciliate with similar *short* hairs. Corolla pink, hairy. Stamens included.

*M. arvensis*, var. *præcox* is allied to the var. *Allionii*, but is more erect, with shorter branches, lighter green, with more obtuse leaves and bracts, and much longer calyx-teeth. River Medway below Tonbridge, 1919, and R. Medway, Yalding, Kent, 1921, *J. Fraser*.

Var. *PARIETARIAEFOLIA* (Becker). Stem erect, flexuous, liable to get bent or borne down, simple to profusely branched, with long flexuous branches, almost glabrous except towards the top, where it is thinly covered with very short deflexed hairs, 2 ft. long or more; internodes

2.5-5 cm. long; the uppermost nodes of the stem and branches are slightly bearded. Leaves oblong-elliptic, obtuse,  $\pm$  attenuate at the base, serrated above the middle chiefly, sometimes below it, with a long entire base, thinly hairy, with very short hairs while young, practically glabrous when mature, except for a few cilia on the margin; superficies 4-6.5  $\times$  1.8-3 cm.; serratures 0.25-0.75 mm. deep. Bracts smaller than the lower leaves, and gradually smaller towards the top. Several of the verticils on the stem and branches are shortly pedunculate. Pedicels glabrous or with a few 1-jointed deflexed hairs scarcely visible to a lens. Base of calyx thinly furnished with very short ascending hairs of 1-2 joints, scarcely visible; teeth long, acuminate from a triangular base, thinly ciliate with hairs like the tube. Corolla purple.

The above is the most nearly glabrous of the varieties of *M. arvensis*, judging from my specimens. The hairs on the pedicels (when present), on the base of the calyx and on the teeth are remarkably short, consisting of 1-2 joints. The calyx-teeth are also the longest I have seen amongst the varieties of *M. arvensis*. Symond's Yat, W. Gloucester, 1926, *M. L. Wedgwood*.

Var. *CUNEIFOLIA* Lej. et Court. Stem erect,  $\pm$  flexuous, simple or furnished with short or long, slender flexuous branches, green, subglabrous on the lower half, thinly clad with short closely deflexed hairs on the upper half and slightly bearded at the upper nodes, 6-16 in. high; internodes 2.5-4 cm. long. Leaves *lanceolate-elliptic, attenuate and acute at both ends*, thinly sprinkled with very short hairs on both faces, petiolate, finely and acutely serrate, pale apple green; superficies 4.5-6.5  $\times$  2-2.5 cm.; serratures 0.25-1 mm. deep; petioles up to 1 cm. long. Verticils sometimes shortly pedunculate. Bracts similar to the leaves, gradually becoming smaller upwards, but not much shorter. Bracteoles lanceolate, rather shorter than the corolla. Pedicels glabrous, or having a few 2-jointed deflexed hairs near the top. Calyx-tube thinly furnished with 1-4 jointed ascending hairs; teeth *long and slender* from a triangular base, thinly ciliate with 1-2 jointed hairs. Corolla purple, thinly hairy. Stamens exserted.

Easily recognised and distinguished from var. *praecoax* and var. *parietariaefolia* by its lanceolate-elliptic leaves, attenuate to a sharp point at both ends, and the pale green colour. For localities see *Rep. B.E.C.* 1924, p. 626.

## II. Throat of calyx closed with hairs.

*MENTHA PULEGIUM* L. Sp. Pl. 577 (1753). *Pulegium vulgare* Miller Gard. Dict. ed. viii., No. 1 (1768). *M. Pulegium* L. Sole Menth. Brit., p. 51, t. 23. Stem prostrate, simple or more often profusely branched, often red, glabrous or subglabrous or finely downy at the base, according to surroundings, more or less densely covered with short, closely deflexed hairs, and long loosely recurving white ones, 6-18 in. long; internodes 1-4 cm. long. Leaves very small, oblong, oval or suborbicular un-

der dry, exposed conditions, rounded at the ends ± cuneate or sometimes attenuate at the base, thinly and minutely serrate, shortly petio- late, and so shortly puberulous on both faces as to appear glabrous, densely punctate with glands beneath; superficies 0.8-2 × 0.6-1 cm.; serratures 1-6 on each margin, 0.25 mm. deep or less. Verticils all separ- ate, sessile. Bracts like the leaves but gradually smaller, though al- ways longer than the flowers, and the uppermost without flowers. Pedi- cels densely covered with 1-2 jointed, slightly deflexed and some horizon- tal hairs or all 1-celled and horizontal. Calyx bilabiate, tubular, fur- nished with 1-3 jointed, ascending hairs; teeth ciliate with 1-2 jointed hairs; ribs of calyx very strong; throat closed with hairs. Corolla very hairy without, glabrous within, pale to deep purple. Stamens exerted.

*Penny-royal* cannot be confused with any other Mint. Blackbrook, Dorking, 1902, Earlswood Common, 1904, Stonebridge, Dorking, 1916, Dunsfold Green, 1925, North Holmwood, 1926, all in Surrey, *J. Fraser*.

Var. *EXIGUA* Huds. Fl. Angl., p. 223 (1762). Flowers verticillate. Leaves lanceolate-ovate, glabrous, acute, *quite entire*. This is Hudson's description, and a specimen in the herbarium of Linnaeus agrees with it.

Var. *ERECTA* Martyn. Mill. Dict. iv. (1807). Syme Eng. Bot. ed. 3, vii., 24 (1867). *Pulegium erectum* Mill. Gard. Dict. ed. viii., No. 2 (1768). Stem erect, 6-18 in. high, the taller plants chiefly in cultivation, flexuous, sometimes subglabrous near the base or ± densely pubescent throughout with very short, closely or loosely deflexed hairs, simple or profusely branched, with ascending flexuous branches, 1-5 in. long, red- dish or green; internodes 1-4 cm. long.

Not by any means a constant variety. In 1914 there were hundreds of plants about 6-12 in. high in a small pool on Limpsfield Common, Sur- rey, and by 1920 most of them had died and the remainder reverted to the creeping form. In a pool at Stonebridge, Dorking, the plants re- tained the creeping habit for many years, but a cultivated piece formed a pyramid of branches round a stem 12 in. high with prostrate stolons. St Issey, Cornwall, 1899, *E. C. H. Davies*; Limpsfield Common, 1914, and cultivated from Stonebridge, Dorking, Surrey, 1921, *J. Fraser*.

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