THE BOTANICAL SOCIETY AND EXCHANGE CLUB OF THE BRITISH ISLES.

REPORT FOR 1929

(WITH BALANCE-SHEET FOR 1928),

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.

CORR. MEMB. SOC. BOT. GENEVE ET CZECHO-SLOVAKIA.

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THE BOTANICAL SOCIETY AND EXCHANGE CLUB OF THE BRITISH ISLES.

(VOL. IX. PART I).

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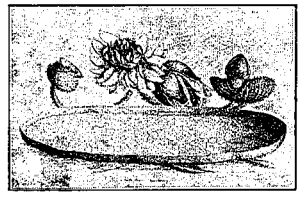

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REPORT FOR 1929

BY THE

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G. CLARIDGE DRUCE, F.R.S.,

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BOTANICAL SOCIETY & EXCHANGE CLUB OF THE BRITISH ISLES.

THE REPORT OF THE SECRETARY & TREASURER,

G. CLARIDGE DRUCE, YARDLEY LODGE, OXFORD,

FOR 1929.

BALANCE-SHEET FOR 1928.

Subscriptions received, -	£270	17	0	Printing Reports, &c., -	£243	16	8
Sales of Reports and Advertisements, - -	38	0	0	Expenses of Distribution,	2	15	9
Life Members, - -	14	0	0	Critics, Typing, etc., -	13	19	1
Balance from 1927, - -	42	19	4	Postages, Carriages, etc., -	27	13	6
				Benevolent Fund, - -	20	0	0
				Balance, - - - -	57	11	4
	£365	16	4		£365	16	4

Balance carried forward, £57 11s 4d.

PUBLICATION FUND.

Balance from 1927, - -	£31	12	6	Balance, - - - -	£45	3	4
Sales, 1928, - - -	6	5	0				
Do. 1929, - - -	1	8	0				
T. Buncle & Co.—Sales, -	4	7	10				
Advertisement, - -	1	10	0				
	£45	3	4		£45	3	4

Balance in hand, £45 3s 4d.

Life Members' Fund, £102 1s 0d. Benevolent Fund, £59 3s 6d.

THE TROWER FUND.

Donation from Miss C. G. Trower, - - - -	£150	0	0	Printing and Plates, -	£133	12	1
				Balance, - - -	16	7	11
	£150	0	0		£150	0	0

Balance carried forward, £16 7s 11d.

Examined and found correct.—F. A. BELLAMY, F.R.A.S., 20th December 1929.

MEMBERS' SUBSCRIPTIONS.

May the Treasurer appeal to the members (1) to pay their subscriptions in January for the current year when they become due. (2) If they wish to resign to let him know before the end of January. The failure of this act of courtesy gives great additional trouble and expense which really has to be unfairly borne by the other members. Payment for three years is strongly urged.

The year 1929 was, in many ways, an annus mirabilis. The intense and prolonged cold of the first three months was devastating to the very old during the time the frost had such a hard grip upon the earth. Over a very large area of the Midlands and southern England, there was a practically rainless summer (oddly enough, wherever I went there was rain), and this prolonged drought had a marked effect upon vegetation. Despite the small amount of rain during the first eight months, the torrential downpour of the later period of the year resulted in an almost average rainfall for the year.

Perhaps due in part to the lower winter and spring temperature which retarded vegetative growth, and in a greater degree to the long spell of almost unbroken sunlight and the higher temperature of the summer, there was a profuse flowering of certain plants, especially shrubs and trees. Rarely have certain species shown a greater magnificence of bloom. The glorious inflorescences of *Laburnum*, *Pyracanthus* and Hawthorn have rarely been excelled, and never have I seen such a harvest of beech-mast. So plenteous and heavy was it as to weigh down the branches nearly to breaking point. The Wayfaring Tree and Spindle Tree, too, were in most prolific fruit, but the Dog-roses were not so showy.

The flowers of *Achillea Millefolium*, *Pulicaria dysenterica*, *Lychnis alba*, *Anthemis arvensis*, and the Dandelions were exceptionally abundant, and gladdened the eye with their splendour. The dried-up ponds also offered a splendid show of *Myosotis*, *Alopecurus aequalis*, Chenopods, and Polygonums on their exposed mud.

The year has not been marked by exciting discoveries, but steady progress has been made in the study of Jordanons, some new Rubi have been described, and several Erophilas new to Britain are enumerated in this Report. Mrs Wedgwood found a new *Alchemilla—controversa* on Cave Hill, Belfast. I found a new hybrid Thyme on the downs above Bowood in Wilts, and subsequently gathered it on Selsey Common, in Gloucestershire. A well-established alien species was found by the Rt. Hon. H. J. Baker at Mells, in Somersetshire, which I went to see. We found a considerable growth of it high up on one side of a wooded valley. It is *Scutellaria Columnae* All., but one could not arrive at any conclusion respecting the means of its introduction. Many other Adventives were found by the writer and Sir Roger Curtis on the rich area of Burton-on-Trent. One of the more interesting species, which from a short distance one thought was *Tordylium*, was *Coriandrum Tordylioides*,

a rare Syrian species, easily known by its fruit. Growing with it was *Carthamus tenuis* Bornm. Mr Colin Trapnell found a new variety—*microcarpa*—of *Erophila* on the Berkshire Downs, and Mr W. Watson identifies a Berkshire *Rubus* found by me as *R. egregius* Focke. Miss Maud Wilkinson and Miss Owen noticed a Thistle in N. Devon which they thought to be *tuberosus*. I went to see it growing and found it to be the hybrid, *palustre* × *pratense* = *C. spurium* Delarb. Four specimens were noticed in a rough field above Kings Nympton with quantities of the putative parents. Col. H. H. Johnston, who has recently undergone a severe operation, has two new Hawkweeds from Hoy, which Dr Dahlstedt names *Hieracium subalpestrifrons* and *H. dasypodon*. A variety of *Euphrasia borealis*, which he found in Fetlar, Mr Pearsall names as a new var.—*atropurpurea*. I found the same form in Unst.

Among Adventive Chenopods I have added ×*C. Probstii* from Galashiels, with Miss Hayward, ×*C. suecicum* from Oxford, Selkirk, etc., as well as *C. Zobelii*. Mr J. Fraser has named a hybrid *Mentha* from Aberdeenshire.

In 1912, I gathered in Lady Victoria Russell's garden at Shere an *Equisetum*, then pushing its way through a gravel path. I could make nothing of it but *hyemale*, which was on record for Surrey. Recently Lady Davy saw it there, where, in the 17 years which have elapsed, it had much increased, even spreading into an adjoining field. She thought it was different from the Weston-super-Mare plant. We went over to see it and its present state left no room for doubt about its distinctness. It is a species of Western France—*occidentale*. Mr C. E. Salmon sent several specimens of *Glyceria distans* to Prof. Holmberg, who says they include the true *distans* and *retroflexa*. It may be said that *retroflexa* is based on Curtis's plate of *Poa retroflexa* in the *Flora Londinensis*. The true *distans* was so named for me by Hackel, many years ago.

Last January, I tried to get out of the cold, and took a passage on the "Highland Monarch" to Gran Canaria, where we had sunshine and warmth. Even then there were many flowers out and, in the Municipal gardens, Roses, Heliotrope, Bignonia and Pelargonium grew galore. We made many expeditions into the hills, but there the season was too early for most things, but we got the *Habenaria* for which only a few localities are cited in Pittier's Flora, in many places. It grows out of rock-fissures as well as on dry banks. We had the advantage of Mr Trethewy's company on our visit. At Tamaraceite we added *Fumaria Bastardi* to the Flora of Gran Canaria, as well as *Bursa patagonica*, *B. mediterranea* and *B. provincialis*. To Teneriffe we added *B. concava* and *Chenopodium giganteum*. For several days we had an uninterrupted view of the Peak, and found the special species of *Pancratium*, and the beautiful grass, *Tricholoena rosea*, with its red panicle and florets, and masses of *Habenaria tridactylites* in the Mercedes Forest. We only went up to about 5000 feet on the Peak, but even at that height there was too much snow to encourage a botanist. The curious Composite, *Siegesbeckia orientalis*, which has recently occurred near Formby in Lancashire, is naturalised near Orotava. Signora Perez showed me several hybrids of

Limonium in her large garden. The greater part of our gatherings still remain unnamed. The cliff drive from Orotava to Buenavista was magnificent, and the quantities of *Sempervivum* and *Sedum* were remarkable. *Tabellare*, a most curious species, was plentiful.

In May, a party of our Society were the guests of the Hon. Mr and Mrs Colborne Vivian, at Bosahan. It included Mr Justice Talbot, Sir Roger Curtis, Miss Clarice Vivian, Hon. Mrs and Miss Baring, Lady Alethea Buxton, Miss D. Meynell, Miss Butler, etc. We had the advantage of the company of Mr Rees, who showed us the treasures at Hayle, where *Ajuga genevensis* looked quite at home. *Pinguicula grandiflora* was in good blossom in its old station. *Trigonella Ornithopodioides* was flowering well in the gravel carriage drive at Bosahan. Most of the Lizard plants were seen, but the rare Trefoils were not in flower.

In early June a visit was made to Malvern, where we are glad to say *Sagina Reuteri* is still to be found. Mr Bickham's garden at Ledbury was in magnificent condition. At Tewkesbury the Woad exists, but in smaller quantity than in former days. A visit was paid to Major Guthrie Watson at Culeaze, Dorset, when, despite the rain, some species were added to the Dorset flora. Towards the end of the month another party of our members was entertained by the Earl and Countess of Buxton at Newtimber, in Sussex, which included Lord and Lady Rayleigh, Hon. Sydney and Lady Delia Peel, Hon. Miss and Hon. Jean Elphinstone, etc., where *Phyteuma spicatum* was seen, as well as the treasures of the Lewes levels, Cuckmere and Newhaven.

Then I went on to Bowood, where another group were entertained by the Marquess and Marchioness of Lansdowne, the guests including Mrs H. Graham, Lord and Lady Henry Bentinck, Lady Gwendolen Churchill, and Rt. Hon. H. J. Baker. We saw *Euphorbia pilosa*, under Mr Green's guidance, at Bath, and *Potamogeton Drucei*, *Astragalus boeticus* and a new variety of *Hieracium maculatum*. Another day was devoted to Clifton Gorge and Durdham Downs. *Polemonium* was seen near Calne, and on the chalk uplands above Bowood grew a new hybrid Thyme $=\times T.$ *Lansdowneiae* already alluded to.

From Bowood, Mr H. J. Baker took me to see the *Scutellaria* which he had recently gathered there, and of which we found a large patch some two hundred feet above the valley level. *Hieracium Pulmonarioides* was also in the same valley, the seeds having probably been wind-borne from Mells, where it is abundant on the bridge and on many walls and cottages. *Heracleum Mantegazzianum* and *Symphytum peregrinum* were plentiful. Here we were the guests of Lady Horner, who kindly took us to the large wood of Asham, where an Eyebright, probably a new species, and the new British *Hieracium acuminatum* Jord. were found.

Sir Roger Curtis then fetched me to go to Burnham-on-Sea, where another group of botanists worked the district and saw *Orchis hircina* and *Sisyrinchium angustifolium*. *Hieracium maculatum* was at Highbridge with some adventives. Cheddar and its neighbourhood were visited. *Carex depauperata* was in fine fruit, and *Lithospermum purpureo-caeruleum* was common. Purn was visited for *Cerastium pumi-*

lum and the hybrid, *Helianthemum sulphureum*, and Uphill showed us *Koeleria vallesiana*, *Trinia*, etc., while Weston-super-Mare still has abundance of *Equisetum variegatum*. There, too, grew *Orchis praetermissa* and several hybrid Willows.

We then motored on by Bristol to Yate and Wickwar, and thence to Stroud, where *Cephalanthera rubra* was not to be seen. Selsey Common had, however, *Herminium*, and there we picked the same hybrid Thyme that occurred in Wiltshire. There is *Hieracium Sublepistoides* in the wood. We then motored to Lichfield, where ×*Potamogeton Cooperi* was still plentiful. Near Burton-on-Trent, Sir Roger showed me the newly-discovered *Aconitum anglicum* for Derbyshire. At Burton a very large number of adventives were gathered—160 species in all.

A flying visit was then made to Ireland, leaving Rugby on Sunday evening for Dublin, where the meeting of the British Pharmaceutical Conference was held. The last meeting held there was in 1901, when the writer was the President. On this occasion, after the Presidential address by Mr Bennett, he received an ovation, which lasted for several minutes, on his rising to propose a vote of thanks to the President. He was then motored to Avoca to see the Walpoles' beautiful garden with its marvellous collection of rare plants in magnificent flower. Motoring back to Kingstown, I was enabled to reach Oxford by 7 a.m., in time to attend the Encaenia when Lord Grey presided.

In early August, Mr P. M. Hall and I explored southern Hampshire. *Spiranthes* was flowering in the New Forest. On August 11, I went northwards to stay with Lord and Lady Elphinstone at Balnaboth in Angus. The weather was very bad, but *Cicuta* and other plants were seen at Rescobie, and in Glen Prosen *Juncoides nemorosum* and *Poa Chaixii* were observed. The visit to Glen Dole showed the usual plants, but they were in poor condition. Then I went on to Inchdowrie, in Glen Clova, but continuous rain prevented real work. I then went south to Thirsk, where I had some interesting excursions with Mr and Mrs Foggitt. At Castle Howard, *Acorus* was flowering freely. A visit to Teesdale showed *Saxifraga Hirculus*, poor in condition and quantity. At Hovingham, some fields had been dressed with shoddy-waste and some Chenopods were observed. Ashkam showed *Calamagrostis Calamagrostis* and *Ranunculus Lingua* in fine condition, and Strensall its lovely *Gentiana Pneumonanthe*. Skipwith Common had masses of *Rumex maritimus* and ×*R. limosus*. Market Harborough was visited to study *Potamogeton decipiens*, which is common in the canal there. The Naze estuary was explored in July. A visit to Wales afforded a sight of *Potentilla rupestris* still in existence. A short visit to N. Devon to see the Thistle already mentioned showed that *Polygonum polystachyum* is completely naturalised between Barnstable and Linton. *Hieracium porrigens* was seen in the locus classicus and in Woody Bay we saw *Gentiana campestris*. In October I met Lady Davy to see *Cyperus longus*, which the Rev. D. M. Heath had recently found there. I think it has been introduced. Later I went to Reigate to lunch with our late member, Mr C. E. Salmon, who was then looking extremely well.

In October I went north to Newcastle to attend the very fine and successful Centenary Meeting of the Hancock Museum, under the Presidency of Viscount Grey of Fallodon. I presented addresses of congratulation on behalf of (1) the University of Oxford, (2) the Ashmolean Natural History Society of Oxfordshire, and (3) our own Society. Addresses were given by Lord Armstrong, etc. In the evening I attended the dinner, at which Lord Grey, Sir Charles Parsons and others were present. The following week I was present at the Gas Conference at Eastbourne, which was extremely satisfactory. The town was unusually gay owing to the visit of the Duke and Duchess of York to open the new and extensive area of Downland, recently acquired by the town.

The Publications of the year are reviewed in subsequent pages. One of the most successful is Miss McKelvey's work on "The Lilac," alike pleasing for its illustrations and for its literary research. *Nature*, the *Gardeners' Chronicle*, the *Journal of Botany* and the *Naturalist* have much of interest in them.

The new members include:—Miss Abell, Mr Gerald Ash, Mr E. Leigh Atkinson; Lady Baker, A.R.A.; Mr C. M. Baker, Lady Charles Bentinck, Lord Henry Bentinck (1930), Dr K. Blackburn, H. H. Maharajah of Burdwan, Hon. Mrs Campbell, Miss E. C. Claydon, Mr Robert Courthope, Mr John Cripps, Mr Henry Forster, Mr J. H. Gladstone, Mr W. B. Gourlay; Mr Robt. Gurney, D.Sc.; Mrs Harford; Rev. J. L. Hooppell, F.S.G.; Major C. C. Hurst, Ph.D.; the Lord Joicey, Mr R. Kempthorne, Miss Lane Fox; Mr C. Leighton Hare, B.Sc.; the Lady Lilford, Miss D. Mander, Miss H. L. Overy, Mrs Payne, Mr M. Qongur, Mr E. M. Redhead, Mr E. Rees, Rev. S. O. Ridley, Mr R. W. Robbins, Prof. R. Robertson, Mr R. H. Sargent; Sir Samuel Scott, Bart.; Mr T. W. Southron, Torquay Natural History Society, Mr W. G. Trower, Miss Maud Wilkinson, Miss Wotherspoon, Mr Bernard T. Ward (1930), Prof. Scott Watson (1930).

Our death roll has been very heavy. In the loss of Mr Arthur Bennett and of Mr C. E. Salmon have passed away two of our best botanists. Both had acted as our referees for many years. One was the specialist in Pondweeds, and the other in Sea-lavenders. Besides these, we regret the loss of that enthusiastic gardener, Sir Alexander Buchan Hepburn, Bart.; H.H. Maharajah of Jhalawar, an enlightened patron of learning; the Countess of Fortescue, once Lady-in-Waiting to the Queen; the Countess of Dartmouth, Mr Alexander Roberts, Mr E. Salow Allen, Mrs Russurum, Miss Alice Trower, Canon Benwell, Mr J. Cosmo Melvill, a most generous donor to Manchester University; and Mr R. W. Goulding, the very able librarian at Welbeck, whose notes frequently enriched these pages. These are indeed heavy losses, and it will be well nigh impossible to replace them. "The Flora of Surrey" has had an unfortunate history. It was begun by Mr Beeby over half a century ago. His material was put into Mr Salmon's hands to complete. Towards it Mr Salmon had amassed much material, and a large portion of it is already printed. Now another change of editorship has to be made and further delay must necessarily be incurred.

Among many changes that have taken place is the transference of Prof. Dr Walker Stiles from Reading to the Chair of Botany at Birmingham, lately filled by our genial member, the late Prof. Yapp. Mr J. R. Matthews has been chosen to occupy the Chair at Reading.

We offer our best wishes to Captain John Ramsbottom, O.B.E., Hon. Secretary of the Linnean Society, on his accession to the Keepership of Botany in the British Museum, Crowwell Road; also our sincere congratulations to Dr L. Cockayne on receiving the Darwin medal of the Royal Society, and Mrs O'Callaghan on her receiving the Grenfell medal (1930) for her beautiful paintings of British plants.

To the authorities of the Royal Botanic Gardens at Kew and Edinburgh, and of the Natural History Museum at Cromwell Road, we are indebted for help. Among foreign botanists we are grateful to M. Patrice Riencourt de Longpré for determining the Leguminosae, Prof. O. E. Schulz for naming the Cruciferae, Dr Ronniger the Thymes, Dr Almquist the Shepherd's Purses, Dr J. Murr and Dr P. Aellen the Chenopods, Dr R. Danser the Polygonaceae, Dr Dahlstedt the Dandelions, Dr F. Jaquet the Alchemillas, Dr Probst the Adventives, Dr K. Zahn the Hawkweeds, and Prof. J. Holmboe.

To Dr S. Howard Vines, F.R.S., the Rev. F. Bennett, Mr T. Gambier-Parry, and Mr R. H. Corstorphine we are indebted for literary help; and for critical examinations of British species we are very grateful for the kindness shown by Mr J. Fraser, Dr E. Drabble, Mr C. E. Britton, Mr W. H. Pearsall, Col. A. H. Wolley-Dod, Rev. H. J. Riddelsdell, Mr W. Watson, Mr D. Lumb, Mr A. E. Wade, Mr R. Butcher, Mr I. A. Williams, the late Mr C. E. Salmon, Mr W. O. Howarth, Mrs Gregory and Mr P. M. Hall.

ADVISORY COMMITTEE.

In case of the Secretary vacating his position, the following members will act in choosing a successor:—Rt. Hon. Harold T. Baker, Hon. Mrs G. Baring, Mr R. H. Corstorphine, Sir Roger Curtis, Mr C. E. Britton, Lady Davy, Mr and Mrs Foggitt, Mr P. M. Hall, Mr W. H. Pearsall, Miss Vachell, and Mrs Wedgwood.

PLANT NOTES, ETC., FOR 1929.

(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*; *N.W. Nat.* = *North Western Naturalist*; *Ph. Journ.* = *Journal of the Pharmaceutical Society.*

6/4. RANUNCULUS AURICOMUS L., var. CERVICORNIX Kittel. Ham, Wilts, and Berks, June 1929, G. C. DRUCE.

6/22. R. TRICHOPHYLLUS Chaix. A variety, with glabrous carpels, in the ditches near Burnham, N. Somerset, July 1929, G. C. DRUCE.

Var. GODRONII (Gren.). Martin Mere, S. Lancs, F. W. HOLDER; Brickhill, Bucks, G. C. DRUCE, the latter " an unusually robust form with densely hairy carpels. The submersed leaves are very much like those of the rarer *sphaerospermus*. The flowers are too small and the pedicels much too short for that species."—W. H. PEARSALL.

Var. SUBMERSUS Bab. Castle Ashby, Northants, G. C. DRUCE.

6/27. R. SPHAEROSPERMUS Boiss. & Bl. Cuxham, Oxford, *locus classicus*, small plants about nine inches long. Transplanted to a tank in my garden, in a few weeks they grew so rapidly as to fill the tank. Specimens of this lax plant were reported (29/7/29) by Mr PEARSALL as " an extremely interesting *sphaerospermus* grown under abnormal conditions of water, and especially of light. These have ' stretched ' the internodes, peduncles and segments of the leaves. The regular disposition of the leaves, the size of the non-converging petals, and especially the carpels (few, but very characteristic) are well shown. Type examples, in great abundance, but then immature, from Winterborne Steepleton, June 7, 1929, with Major GUTHRIE WATSON.

21/2. PAPAVER RHOEAS L., forma ROSEA Druce. Normal plants, with pale pink flowers as in *Malva moschata*, at Crab Tree, Hants, Rt. Hon. H. BAKER.

34/2. ×CHEIRANTHUS ALLIONII Hort. = × ERYSIMUM ALLIONII = E. OCHROLEUCUM × PEROFSKIANUM F. & M. Alien, garden hybrid. Waste ground, Kennington, Berks, 1929, G. C. DRUCE.

35/4. RADICULA ISLANDICA (Oeder) Druce, forma LAXA (Rikli), teste O. E. Schulz. On the mud of a dried up reservoir at Byfield, Northants; Clattercut, Oxon, G. C. DRUCE.

43/1. DRABA AIZOIDES L., var. MONTANA Koch Syn., 62, 1835, excl. Syn. Host. Planta plerumque validior, fructifera, usque 15 cm., alba. Flores paulo majores quam in planta typica. Pennard Castle. We seem to lack the type in Britain. The *E.B.* Plate is a mixture, not true *Aizoides*.

43/2. D. RUPESTRIS R. Br., var. b. LEIOCARPA O. E. Schulz Das Pflanz., 224, 1927. Siliculae subglabrae vel glaberrimae; pedicelli interdum glabri.=var. ALPICOLA Hook. Fl. Scot., 197, 1821, non Wahl. Ben Lawers, GREVILLE; Cairngorms, HOOKER.

Var. c. BRACTEATA O. E. Schulz, *l.c.* Folia caulina 5, oblongo-ovata, utrinque 1-denticulata, infima 1 cm. longa, sensim breviora et angustiora, omnia bracteiformia; pedicelli inferiores fructiferi, 1.2 cm. longi. Ben Lawers, DICKSON.

43/3. D. INCANA L., var. NANA Lindb. (var. GRACILIS (Ar. Bennett non Meyer)). Plants very small, 1 inch, on the shell-sand at Mellon Charles, W. Ross, and at Tain, East Ross. On the sugar limestone at Cronkley, N.W. Yorks; Widdy Bank, Teesdale, Durham; on the Serpentine at Balta, Unst, Zetland; Craig Cailleach, Ben Lawers, Mid-Perth; Ben Bulben, Sligo (A. G. MORE)! Often mistaken for *D. rupestris*. Planta pusilla; caules 1.5-10 mm. longi, simplici vel ramosi, parvifolia, rarissime aphylli. G. C. DRUCE.

44/2. EROPHILA PRAECOX (Stev.) DC., var. MICROCARPA O. E. Schulz. On ant-hills, Park Farm Down, Berks, alt. 600 ft., C. G. TRAPNELL. Det. O. E. SCHULZ.

54/2. BRASSICA NAPUS L. = B. CAMPESTRIS L., f. AURICULATA DC. Burton-on-Trent, Staffs, G. C. DRUCE. Det. O. E. SCHULZ.

Var. SYNTOMOCARPA O. E. Schulz. Didcot, Berks, July 1929, G. C. DRUCE. Det. O. E. SCHULZ.

56/2. ERUCA ERUCA (L.), var. ERIOCARPA (Boiss.). Burton-on-Trent, Staffs, G. C. DRUCE. Det. O. E. SCHULZ.

Var. (proles) LONGIROSTRIS (Uechtr.). Burton-on-Trent, Staffs, G. C. DRUCE.

59/20(2). BURSA PERGROSSA (E. At.). Wilcote, Oxon, June 1929, G. C. DRUCE. *B. pergrossa* was originally found at Bremen by Dr Almquist, teste E. ALMQUIST.

61/25. LEPIDIUM RAMOSISSIMUM A. Nels., var. ROBUSTUM Thell. Hovingham, N. Yorks, G. C. DRUCE, teste O. E. SCHULZ.

65/7. IBERIS ODORATA L. Alien, Greece, etc. Burton-on-Trent, Staffs, G. C. DRUCE. Det. O. E. SCHULZ.

88/14. VIOLA CONTEMPTA Jord., nov. var. PATULA E. Drabble in Journ. Bot., 74, 1929. Known from the type by its widely spreading, more or less prostrate habit. Shere, Surrey; Crowborough, Sussex; Chesham, Bucks; Purwell Field, near Hitchin, Herts.

89/1. POLYGALA SERPYLLIFOLIUM Hose, var. DECORA C. E. Salmon in Journ. Bot., 193, 1929. Cwm Glas, Carnarvon, 1890, H. T. MENNELL; Dalnaspidal, Perth, 1922, C. E. SALMON; Braemar, Aberdeen; Ben Bulben, Sligo; Caenlochan Glen, Angus, 1916; Glen Fiagh, 1905, G. C. DRUCE. This, doubtless, is my var. MAJUS from O'Connor Hill, gathered in 1902, and from Glen Aan, Banff, in 1888.

101/7. STELLARIA GRAMINEA L. Hogsback, Surrey, G. M. ASH. A form with sepals wider, petals shorter, some with rounded points, and having more numerous flowers . . . some flowers double, others apetalous.

117/2. MALVA SYLVESTRIS L., var. VIOLASCENS W. B. Turrill in Gard. Chron., 164, 1929. Somerset, H. WHITLEY. I have seen var. CAERULEA Dr. near Burnham, in Norfolk, which is of a chicory-blue colour, but as it is a colour form whose permanency under culture has not been proved it is not given in my *List*.

[127/6. GERANIUM ENDRESSI J. Gay, var. ARMITAGEAE W. B. Turrill in Gard. Chron., 164, 1929. Cultivated at Dadnor, Ross, by Miss Armitage. For notes on *Geranium Endressi* see *Journ. Bot.*, 44, 88, 1928.]

138/1. RHAMNUS FRANGULA L. With proliferous flowers and foliose petals at Wisley Common, Surrey, N. K. GOULD. See *Journ. Hort. Soc.* xxxvii., 1928.

142/2. ACER CAMPESTRE L. (HEBECARPUM), nov. var. TRILOBATA Druce. Leaves three-lobed, 5 cm. long × 4.75 cm. in broadest part, the centre lobe 3 cm. long by nearly 2 cm. broad, the lateral 3.25 cm. long × 1.40 cm. broad. A very few leaves show signs of a slight incipient lobe. From large tree, Cranborne, Dorset, G. C. DRUCE.

183/10. PRUNUS LUSITANICUS L., with the var. MYRTIFOLIA. Alien, W. Europe. Naturalised by the road-side, Hascombe Hill, near Cranleigh, Surrey, 1929, R. GRIERSON.

185/1. RUBUS IDAEUS × ULMIFOLIUS. Hungerford Park, Berks. In *Rep. B.E.C.*, 726, 1922, I alluded to an extraordinary Bramble found

by Major Bates Van de Weyer, in which the ripe fruits separate from the receptacle, are dull red in colour, and have the flavour of Raspberry. It is not a sub-erect species. The stems root at the tips, but I can see no evidence in the leaf or stem of *idaeus*. G. C. DRUCE. Mr W. WATSON says:—"The completely septenate leaf and the felted drupelets point unmistakably to the presence of *idaeus*. *R. idaeus* has felted carpels, but none of the blackberries have; I think the other parent is *ulmifolius* not *caesius*. Vide the long panicle and strong based prickles. This hybrid has not, I think, been reported previously, either in this country or abroad. Usually *R. idaeus* is out of flower when *R. ulmifolius* begins to flower."

185/47. R. ULMIFOLIUS Schott, var. CONTRACTIFOLIUS (Sudre). So named by W. WATSON. Hunsbury Hill, Northants, September 1929, G. C. DRUCE; Bromley, Kent, W. WATSON.

185/ . R. MACROSTACHYS P. J. M., teste W. WATSON. Sussex, as ERICETORUM. Not the real *ericetorum* Lefèvre (the bramble which Rogers published as *R. Radula*, sub-sp. *anglicanus*), nor is it the Bramble which Rogers issued as *R. Lejeunii*, var. *ericetorum* Lef. It is, I think, pretty certainly *R. macrostachys* P. J. M., which Focke says he received from Rogers as *anglicanus*. It agrees splendidly with P. J. M.'s own description, and with Sudre's description. It is not, of course, *R. fuscus*, var. *macrostachys* Rogers. W. WATSON.

185/72. R. LASIOCLADOS, var. ANGUSTIFOLIUS × PYRAMIDALIS, teste W. WATSON. A very beautiful plant growing with the parents near Bagley Wood, Berks, G. C. DRUCE.

Var. ANGUSTIFOLIUS × VESTITUS, teste W. WATSON. Bagley Wood, Berks, G. C. DRUCE.

185/73. R. EGREGIUS Focke. Boars Hill, Berks, G. C. DRUCE. Det. W. WATSON.

190/4(2). ALCHEMILLA HETEROPODA Buser in Ber. Schweiz. Bot. Ges iv., 73, 1894. Caenlochan, Angus, 1915, MRS CORSTORPHINE. See C. E. Salmon in *Journ. Bot.*, 13, 1929.

190/7. A. TENUIS Buser. Boxwood, Herts, June 12, 1911, J. E. LITTLE. This was probably a mixed gathering since Mr C. E. Salmon says his specimen is not *tenuis*, but M. Jaquet, having again examined my specimen, agrees that it is *tenuis*.

190/8(2). A. ACUMINATIDENS Buser in Bull. Herb. Boiss., ser. 2, ii., 624-6, 1902. By the Spey at Aviemore, Easterness, Miss I. M. ROPER. See C. E. Salmon in *Journ. Bot.*, 14, 1929.

190/8(3). A. CONTROVERSA Buser et Jaquet. Cave Hill, Belfast, MRS WEDGWOOD. "Identical with my Fribourg specimens determined by Buser and myself after his controversy with me."—F. JAQUET.

191/3. AGRIMONIA EUPATORIA L. With white flowers in Berkeley Vale, near Oldbury-on-Severn, Gloucestershire, 1927. Plants were taken to Kew and two of the half-dozen seedlings raised bred true to the white flower colour. Still more specimens were seen in Gloucester in August 1929. The oldest trivial seems to be *leucantha* Kunze, published in 1842. E. NELMES, in *Journ. Bot.*, 341, 1929.

194/19. ROSA TOMENTOSA Sm., var. SCABRIUSCULA, nova forma LEESII Wolley-Dod. Menai Straits, near Bangor, Carnarvon. Named after Arnold Lees.

Var. FOETIDA Bast., nova forma MORETONENSIS Wolley-Dod. Moreton, Hoylake, Newton Heath, Woodchurch, Claughton, all in Cheshire. A. H. WOLLEY-DOD in *Journ. Bot.*, 41, 1929.

196/1. CRATAEGUS MONOGYNA Jacq., var. GRACILIS Druce. Leaf segments narrow. Hoveton, Norfolk, Miss TODD.

[197/6. COTONEASTER HUMIFUSA Duthie. Ex J. H. VEITCH, *Hortus Veitchii*, 396, 1896. China.]

220/10. EPILOBIUM MONTANUM L. At the Watersmeet and about Lynmouth, Devon, a form of this plant appeared in which the petals were more deeply notched. This gave the flowers, when they were nearly closed, the appearance of having eight petals. It was a rainy day so the flowers were not fully open. On spreading out the petals this was shown to be due to the deeper notch. Specimens are distributed through the Club [O. 83].—G. C. DRUCE.

239/4. ×ERYNGIUM OLIVERIANUM Delarbre Eryng. 37, t. 12. Alien, Orient. Waste ground, Lyme Regis, Dorset, August 1929, as *campestre*, Sir M. ABBOT ANDERSON. Mr J. Fraser confirms my name of *Oliverianum*.

274/1. ANGELICA SYLVESTRIS L., nov. var. (vel forma) PURPURASCENS Druce. In the ditches about Braunton, N. Devon, September 1929. Differs from the type in its blackish-purple flowers and in the deeper colour of the stems. Pink-flowered forms are not rare, but this had them very dark purple. The upper leaflet is usually decurrent. G. C. DRUCE.

279/2. CORIANDRUM TORDYLIOIDES Boiss. Fl. Orient. ii., 921. Alien. Syria, Aleppo, in agris incultis. Burton-on-Trent, Staffs, July 1929. From the distance I thought it was the long sought for *Tordylium*, but a glance at the fruits dispelled the idea. Mr FRASER names it as above. It is the first time it has been noticed in Britain, and has been brought in with " Turkish " barley.

282/1. DAUCUS CAROTA L., lusus BI-UMBELLATA Dr. Par Moor, Cornwall, L. T. MEDLIN, ex THURSTON.

287/2. SAMBUCUS NIGRA L., nov. var. OVALI-FRUCTU. Garth Wood, Cardiff, Prof. R. M'LEAN. Differs from the type in the larger, oval berries.

326/1. ANTENNARIA DIOICA (L.) Gaertn. A note on the value of it as a very useful low-growing adjunct to the Rock-garden appears in *Gard. Chron.*, 44, 1925. The form with deep rose-pink flowers, which we have called *roseus*, is wrongly designated as *hyperborea* DC., which differs from type *dioica*, not in the colour of the flowers but in the leaves being hairy on both sides. This was originally found in Skye.

345/4. RUDBECKIA SPECIOSA Wender. Britton & Brown Fl. iii., 472, t. 7. Black-eyed Susan. Alien, N. America. On Rere Hill, Hascombe Hill, Surrey, R. GRIERSON. Named at Kew.

347/14(2). HELIANTHUS MULTIFLORUS L. Alien, N. America. Dagenham, Essex, 1928 [n. 279], R. MELVILLE.

396/9. CIRSIUM PALUSTRE × PRATENSE = × C. SPURIUM Delastre. Rough field near Kings Nympton, N. Devon, September 1929, Miss OWEN and Miss MAUD WILKINSON. Last September there was forwarded to me a portion of a thistle gathered in the above locality by Miss MAUD WILKINSON who thought it might be the Tuberous Thistle. At first I thought it might go under that plant, but, not being satisfied, I went down to Devon and there I was conducted by these ladies to the remote place on the moors (c. 1000 ft.), where it grew in very small quantity, only four plants being seen amid a host of the Meadow and Marsh Thistle. There seems no reason to doubt its being the above hybrid, and to this Mr C. E. BRITTON agrees. The plants are about three feet high and are branched from the base, the long branches bearing about three flower-heads. The phyllaries are neatly arranged, and these have a viscid-looking callosity below the terminal spines which must be due to the *palustris* parentage. As in *pratense* the lower leaves are but little cut, but the stem leaves are regularly cut but with a greater development of spines than in *pratensis*, and they are more spinous-decurrent. We may safely identify it as above, and the combination has received the name × *C. spurium* Delastre. Miss OWEN and Miss WILKINSON are to be congratulated on making so good a record for N. Devon.—G. C. DRUCE.

405/16. CENTAUREA ASPERA Willd., var. AURICULARIA DC. Burton-on-Trent, Staffs, G. C. DRUCE.

405/46. C. VARIEGATA Lamk. (C. SEUSANA Chaix). Alien, Medit. Burton-on-Trent, Staffs, G. C. DRUCE.

407/4. CARTHAMUS TENUIS (Boiss. et Blanch.) Bornmüller. Alien, Jerusalem, Lebanon. Stony fields, Burton-on-Trent, Staffs, came in with Turkish Barley, G. C. DRUCE.

419/22. HIERACIUM SCOTICUM F. J. Hanbury, var. SUBMACULATUM Dahlstedt, nov. var. [Ref. Nos. 4241, 4286.] Differt a typo foliis subinde ± maculatis, cæterum tenuibus minus pilosis. Cæterum vix devians. Seems to be connected with the type through intermediate forms. Style yellow. Rare. Hoy, Orkney, 1929, H. H. JOHNSTON in *Trans. Bot. Soc. Edin.*, 1929.

419/50(2). H. DASYPODUM Dahlstedt, nov. sp., under Zahn's H. PALLIDUM Bivona-Bernhardi. *Caulis* humilis—sat elatus 0-folius, basi sparsim et longe pilosus, cæterum parce pilosus, apicem versus parce stellatus. *Folia* rosularia 4-5 subtus sæpe violascentia, exteriora ovalia obtusa minuta denticulata, interiora lata—anguste ovato—lanceolata dentibus acutis sparsis ad basin longioribus prædita longe acuta, supra subglabra—glabra, rutilus sparsim in nervo dorsali longe et dense pilosa petiolis densissime et longe lanuginoso—pilosa. *Inflorescentia* vulgo pauciflora laxa ramis acladium 10-20 mm. longum ± superantibus, sat dense floccosis glandulis et pilis mediocriter longis sparsim—densiuscule obtectis. *Involucrum* latiusculum basi ± ovata. *Squamae* exteriores sat angustae acutiusculae, interiores angustae ± acutae—obtusiusculae, pilis sat longis apice longe albidis ± densis et glandulis parum conspicuis parvis sparsis obtectae, in marginibus ± floccosae apice carnosae. *Ligulae* obscure luteae. This species seems to be allied to *Hieracium pycnodon* Dahlstedt, but differs from it through the more hairy leaves and petioles and less hairy darker heads. *Locality.*—Reference No. 4012, heathery rocky crags on hillside, 430 feet above sea-level, between Grut Fea and Glen of Button, Hoy, Orkney, July 12, 1928, H. H. JOHNSTON, and J. SINCLAIR [Ref. No. 575]. Common. Plants in full flower. In the living plant, the leaves are dark green above, dark purplish-green or dark purple beneath; style with its two recoiled branches yellow. See *Trans. Bot. Soc. Edin.*, 1929.

419/69(2). H. PSEUDOMICRODON Dahlstedt, nova sp. *Caulis* circa 2 cm. altus ima basi excepta glaber—subglaber a medio parce stellatus apice glandulis minutis sparsis obsitus, 1-3-foliatus. *Folia* sat læte viridia subtus, pallidiora, 2-3 approximata, anguste lanceolata acuta, superiora minus—minusque evoluta anguste lineari—lanceolata longe acuta, summum bracteiforme acutum, omnia parce et remote acute dentata, supra glabra—subglabra subtus præsertim in nervo parce et longe pilosa, inferiora in petiolo longe et sat dense pilosa in margine parce ciliata vel glabra. *Involucrum* mediocre sat angustum. *Squamae* exteriores ± lineares, reliquae anguste ± lineari—lanceolatae, omnes in apicem acutiusculum, protractae, sat crebre et sat longe pilosae, parce et minute glanduliferae, exteriores inferne in margine leviter stellatae. *Calathium* circa 25 mm. diametro. *Ligulae* amoene luteae, dentibus glabris. *Antherae* polline carentes. *Stylus* cum *stigmatibus* luteus. One of the *Oreadea*, under Zahn's *H. saxifragum*, nearly related to *H. microdon* Dahlstedt, from Iceland, but differs from it through more sparingly dentated leaves and more hairy heads. *Locality.*—Grassy,

rocky crags at burnside in a ravine, 280 feet above sea-level, south-west side of Berriedale Burn, below a waterfall, Hoy, Orkney, Scotland, (1) Ref. No. 3657 (plants in full flower), August 8, 1927, H. H. JOHNSTON; and (2) Ref. No. 604 (plants sparingly in flower), August 26, 1928, JAMES SINCLAIR. See *Trans. Bot. Soc. Edin.*, 1929.

419/110. H. SAGITTATUM (Lindeberg) Dahlstedt, sub-sp. SAGITTATUM Lindeberg, var. c. ABRASUM Dahlstedt, nov. var. A typo differt foliis angustioribus, squamis involucri angustioribus magis glandulosis et pilis obscurioribus sparsioribus vestitis, floccis in margine squamarum sparsis et solum ad basin evolutis. Forsitan species nova. *Locality.*—Reference No. 4007, heathery sandy banks at burnside, 50 feet above sea-level, Valley Burn, Hoy, Orkney, July 12, 1928, H. H. JOHNSTON; and JAMES SINCLAIR [Ref. No. 572.] Rare. Plants in full flower. In the living plant, the leaves are dark green above, paler green beneath; and the style is brownish yellow. See *Trans. Bot. Soc., Edin.*, 1928.

419/111(2). H. PYCNODON Dahlstedt, var. b. ACUTIDENS Dahlstedt, nov. var., belongs to Zahn's capital or group-species H. SAGITTATUM (Lindeberg) Dahlstedt. A typo differt foliis magis anguste et acute dentatis squamis involucri margine apiceque minus floccosis. Differs only from the type through more acute and narrower toothed leaves and less floccose phyllaries. *Locality.*—Ref. Nos. 590 and 602, Ward Hill, Hoy, Orkney, July 31 and August 16, 1928, JAMES SINCLAIR. Rare. Plants in full flower, with yellow styles and stigmas.

419/171(3). H. SUBALPESTRIFRONS Dahlstedt, nov. sp., under Zahn's H. SUBRAMOSUM Lönnr. *Caulis* ± elongatus, 1-2-folius inferne sparsim pilosus, superne parce pilosus, apicem versus ± floccosus. *Folia* rosularia 2-3, exteriora ovalia minute dentata obtusa, intermedia et interna ± anguste—late ovato—lanceolata acuta magis conspicue dentata; *folium caulinum infimum* petiolatum anguste ovato—lanceolatum acutum sparsim et breve dentatum vel ad basin dentibus longioribus acutis præditum, *summum* anguste lanceolatum—fere lineare acutis—simum fere integrum, omnia supra parce pilosa subtus in pagina sat dense in nervo dorsali dense pilosa, petiolis sat dense et sat longe pilosa. *Inflorescentia* paniculata contracta involucris summis sæpe bigeminis, petiolis pedicellisque brevibus brevissime acladium 0-10 mm. longum paullum superantibus. *Involucrum* parvum sat angustum basi ovata—turbinata. *Squamae* exteriores anguste ovato—triangularis brevis, interiores latiuscule linearis obtusae—rotundato-obtusae, pilis obscuris sat densis vestitae glandulis solitariis absitae, exteriores magis conspicue floccosae, interiores vix floccosae. *Lingulae* obscure luteae. This species differs from *Hieracium subalpestre* Lindeberg, to which it is very nearly related, through narrower less dentated leaves and contracted inflorescence with darker and less floccose heads. *Locality.*—(1) Ref. No. 565, grassy heathery sandy banks at burnside, 20 feet above sea-level, Burn of Quoys, Hoy, Orkney, July 6, 1928, JAMES SINCLAIR. Rare. Ref. Nos.

4037 and 4038, style brownish yellow, Southburn, Hoy, H. H. JOHNSTON in *Trans. Bot. Soc. Edin.*, 1928.

419/239. H. INULOIDES Tausch, sub-sp. STRICTUM Fries, forma ANGUSTIFOLIA Dahlst. South Walls, Hoy, JAMES SINCLAIR, ex H. H. JOHNSTON in *Trans. Bot. Soc. Edin.*, May 1929.

423/17(2). TARAXACUM CALOPHYLLUM Dahlstedt, nov. sp. *Folia* obscure viridia supra sparsim maculata subtus pallidiora, multilobata lobis brevibus valde approximatis ± curvato—hamatis crebre et sat late dentatis, lobo terminali sagittato parvo—mediocri sæpius bidentato sat longe acuminato, lobulis lateralibus ± hamatis, petiolis pallidis nervo mediano leviter violascente. *Involucrum* breve latum obscure olivaceo—viride. *Squamae* exteriores in alabastro adpressae, deinde base adpressae—recurvae, sat longe ± ovato-lanceolatae—lanceolatae breve acuminatae ± marginatae, interiores lineares apice ± purpurascentes. *Calathium* circa 25-30 mm. diametro. *Ligulae* luteae, marginales extus stria obscure canopurpurea notatae. *Antherae* polliniferae. *Stylus* et *stigmata* lutei. *Achenium* ignotum. Fruit unknown. Judging from the spotted leaves it can very possibly belong to Spectabilia. *Locality.*—Ref. No. 4211, grassy, shell-sandy banks at seashore, 10 feet above sea-level, Bu, Bay of Creekland, Hoy, Orkney, Scotland, May 13, 1929. Rare. H. H. JOHNSTON. In the living plant, according to my observations, the leaves are dark green and not spotted above ("supra sparsim maculata" according to Dr Hugo Dahlstedt's description made from the dried plants), paler green beneath, with a purplish-green midrib. Outer phyllaries adpressed in flower-bud, recurved in flower; inner phyllaries adpressed, simple (not gibbous or appendaged) at the dark purple apex. Corolla yellow, striped dull purplish-green beneath in the outer florets. Style and its two recurved branches yellow.

423/42(3). T. ARANEOSUM Dahlst. Ivinghoe, Bucks, G. C. DRUCE.

423/46(3). T. CALOCHISTUM Dahlst. Husinish, Harris, G. C. DRUCE. "Allied to this," DAHLSTEDT.

423/47(2). T. CONNEXUM Dahlst., nova sp. A *T. subsagittipatente*, cui est sat similis, haec species, foliis laete viridibus, lobis dentatis majis patentibus acutioribis et saepe longioribus, petialis latioribus minus conspicue coloratis, involucris majoribus squamis exterioribus angustioribus majis recurvatis, calathiis c. 45-50 mm. in diametro, radicantibus nec non stylis et stigmatibus fusco-virescentibus, satis est diversa.

This species is in a certain degree intermediate between *T. subsagittipatens* and *T. sagittipatens*. It resembles the former in the faintly coloured petioles, and the often more or less recurved lobes of the outer leaves, and the latter in the pale coloured leaves, the greater heads, the longer outer phyllaries, and the longer marginal flowers. By the Banbury Road, near Steeple Aston, Oxon, G. C. DRUCE.

423/54(3). T. EXIMIUM Dahlst. High Force, Durham, 1928, G. C. DRUCE. "A modification," DAHLSTEDT.

423/65(2). T. LACERABILE Dahlst., nova sp. *Folia* laete viridia, angusta, elongata lineari-lanceolata, lobis plurimis, basi lata, dorso convexo, ± dentato-laciniato, in apicem longum angustum acutum-obtusiusculum protractes, lobo terminali parvo sagittato, lobulo apicali angusto, saepe protracto lingulato-obtuso, petiolis et nervo mediano pallidis. *Scapi* vulgo quam folia breviores. *Involucrum* mediocre crassiusculum subobscurum. *Squamae* exteriores lanceolatae, erecto-patentes, subadpressae, densum ± recurvatae. *Calathium* c. 45 mm. diametro. *Ligulae* sat laete luteae, marginales extus stria cano-violaceae notatae. *Antherae* polliniferae. *Stylus* et *stigmata* fusco-virescentes. *Achenium* olivacea-stramineum, apice acute spinulosum, caeterum ± tuberculatum, 3 mm. longum, 1 mm. latum, pyramide conico cylindrica, 1 mm. longa, rostro c. 9 mm. longo.

The species is allied to *T. stenoglossum* Dahlst., but it differs in its long and narrow leaves with more irregular and more laciniated lobes, and in the small end lobes with narrow tongue-like terminal lobe. Wheatley-turn, near Oxford, May 1929, G. C. DRUCE.

423/75(2). T. OBLONGATUM Dahlst., nova sp. *Folia* subobscure viridia, ± oblongi-spathulata, lobis ± approximatis, brevibus, saepe ± hamate acutis, lobo terminali (in foliis extimis excepto) ± ovato-sagittato, integro obtuso-obtusiusculo v. acutiusculo, marginibus ± saepe valde convexis, in foliis intimis majis dentato, petiolis ± violascentibus. *Involucrum* parvum atroviride. *Squamae* exteriores ± lanceolatae, recurvatae, ± obscure purpureo-violascentes, acutae. *Calathium* parvum, c. 45 mm. diametro. *Ligulae* obscure luteae, marginales extus stria rubro-purpureo notatae. *Antherae* polliniferae. *Stylus* et *stigmata* ± fusco-virescentes.

Distinguished by its spathulate or obovate-lanceolate leaves, with very well developed ovate-sagittate, mostly blunt, end lobes, and small dark heads with recurved, very acute, lanceolate and purplish coloured outer phyllaries. Railway near Notley Abbey, Bucks; Marcham, Berks, G. C. DRUCE.

423/75(3). T. OBSCURATUM Dahlst., nova sp. *Folia* obscure (subprasisio) viridia, lanceolata—oblongo-lanceolata, lobis approximatis latis deltoideis, summis interdum subhamatis, subintegris, reliquis dorso crebre et acute dentatis, lobo terminali ± lato, ± sagittato, mediocri, sat magno marginibus convexis et lobis praeimis parum determinato, subintegro, parum denticulato, dentato breve acuto, petiolis et inferiore v. maxima parte nervo mediano ± violascentes. *Scapi* plures foliis superantes. *Involucrum* mediocre, breve, obscure atrovirescens, basi ± ovato. *Squamae* exteriores breves, ovato-lanceolatae, late lanceolatae, ± adpressae v. late adpressae, atrovirescentes. *Calathium* parvum, c. 40-45 mm. diametro. *Ligulae* obscure luteae, marginales extus stria

rubro-violacea notatae. *Antherae* replete polliniferae. *Stylus* et *stigmata* leviter fusco-virescentes. *Achenium* 3.5 mm. longum, 1 mm. latum, apice breve spinulosum, externum valde squamulosi-tuberculatum, pyramide cylindrica 0.5 mm. longo, rostro 9 mm. longo.

This species is easily distinguished by its dull green (and as it seems a little leek green) leaves, with broad, very densely dentated lobes and broad end lobes, short heads with adpressed, broad, lanceolate or lanceolate-ovate outer phyllaries, and dark yellow flower heads. Seems not to be related to Scandinavian forms. By the Banbury Road, Steeple Aston, Oxon, G. C. DRUCE.

423/77(2). T. PECTINATIFORME Lindb. f. Under wall, Westbury-on-Trym, W. Gloster [333], May 5, 1927, Miss I. M. ROPER. Occurs in Sweden, etc.

423/78(2). T. PERHAMATUM Dahlst., nova sp. *Folia* laete viridia, anguste lineari-lanceolata, multilobata, lobis brevibus, ± hamatis, ± approximatis, acutis, subintegris v. inferioribus ± denticulatis, lobi terminali brevi et lato ovato-sagittato integro, marginibus convexis, folia interiora majis oblongo-lanceolata, lobis ± denticulatis, lobo terminali magno, lato subintegro—integro, marginibus nervi convexis, breve acuto —obtusato, petiolis et nervo dorsali ± violascentibus. *Involucrum* parvum, mediocre, obscurum basi ovato. *Squamae* exteriores ± lanceolatae retroversae, ± violascentes. *Calathium* parvum, c. 70 mm. diametro. *Ligulae* sat obscure luteae, marginales extus stria cano-purpurea notatae. *Antherae* polliniferae. *Stylus* et *stigmata* fusco-virescentes. *Achenium* fusco-stramineum, c. 1.5 mm. longum, vix 1 mm. latum, pyramide brevi conica, superne acuti spinulosum, inferne ± laeve, rostro c. 9 mm. longo.

This species is distinguished by its narrow, pale-coloured leaves with short hamate lobes and broad end lobes (short and small in the outer, and large and broad in the inner leaves), faintly coloured petioles and middle nerves, and dark, small heads with purple-violet outer phyllaries. The outer leaves have small and broad end lobes with highly convex margins, the inner have large, very blunt end lobes, all with short and acute lateral lobes. Seems to be a little related to *T. subsagittipatens.* Boar's Hill, Shefford Woodlands, Berks; Elsfield Lane, Kingsey, Oxon; railway near Notley Abbey, Bucks, G. C. DRUCE.

423/81(2). T. PRAEVNUM Dahlst. Hayle, Lizard Downs, Cornwall; Cronkley Fell, N.W. Yorks (nearest to this species), G. C. DRUCE.

423/87(2). T. SUBLATISSIMUM Dahlst., nova sp. *Folia* sat laete viridia, anguste lanceolata—anguste obovato-lanceolata, lobis ± deltoideis, subhamatis, distantibus, subintegris v. inferioribus sparsim denticulatis, ± acutis, interlobiis ± denticulatis, saepius latis v. margine ± purpurascentibus, lobo terminali ± sagittato, latiusculo, lobulis laceralibus, ± reversis, marginibus suberecti leviter convexis, integro—subintegro breve acuto, folia interiora lobi terminali latiore marginibus majis con-

vexis, petiolis et nervo mediano leviter coloratis. *Scapi* plures folia ± superantes. *Involucrum* ± atrovirescens, mediocre. *Squamae* exteriores ± retroversae, ± lanceolatae, supra ± obscure livido-virides. *Calathium* mediocre, 40-75 mm. diametro. *Ligulae* obscure luteae, marginales extus stria ± obscure violacea notatae. *Antherae* polliniferae. *Stylus* et *stigmata* ± fusco-virescentes. *Achenium* maturum ignotum.

Distinguished by its very pale green (a little greyish-green) leaves, with distant, deltoid, acute lobes, ± purplish coloured interlobes, sagittate end lobes and very dark green heads, with, on the upper side, lighter green recurved outer phyllaries. Reminds one of *T. latissimum* Palmgr., and seems to be allied to it. Little Bedwyn, N. Wilts; Pershore, Worcester; Ham, Northants, 1929; also a form of it from Tubney Wood, Berks, DRUCE.

423/88(2). T. SUBPALLESCENS Dahlst., nova sp. *Folia* laete viridia, anguste elongata, lineari-lanceolata, lobis brevibus deltoideis—triangularibus, angustis, patentibus, recurvatis, ± distantibus dentatis v. inferioribus leviter dentatis, lobo terminali parvo hastato-sagittato (triangulari), lobulis lateralibus brevibus mediocribus, ± patentibus v. subretroversis, lobulo apicali saepius ± lingulato brevi, folia interiora latiora ± oblongo-lanceolata, lobis longioribus majis dentatis, lobo terminali magno latius-angustius ovato sagittato—ovato-hastato, integro, marginibus ± convexis, lobulis lateralibus brevibus, ± retroversis, patentibus, petiolis pallidis. *Involucrum* sat breve basi rotundata. *Squamae* exteriores ± lanceolatae et ± retroflexae, atrovirescentes. *Calathium* 45-50 mm. diametro. *Ligulae* sat obscure luteae, marginales extus stria cano-violacea notatae. *Antherae* polliniferae. *Stylus* et *stigmata* fusco-virescentes. *Achenium* superne acute et sat longe spinulosum, caeterum laeve v. leviter tuberculatum, c. 3 mm. longum, 1 mm. latum, pyramide cylindrica 0.5 mm. longa, rostro c. 9 mm. longo.

This species seems to be very closely allied to *T. pallescens* Dahlst. from Scandinavia. It differs from it in its narrow, more distant and more acute lobes, in the darker green colour of the leaves, and the darker and larger heads with longer outer phyllaries. Shefford Woodlands, Tubney Wood, Berks, 1924; Byfleet, Surrey, 1929; Evesham, Upton-on-Severn, Worcester, 1929. Also, differing a little from type, Elsfield Lane, Oxon; Ivinghoe, Bucks, and a new form allied to this, Bledlow Ridge, Bucks, G. C. DRUCE.

423/88(3). T. SUBSAGITTIPATENS Dahlst., nova sp. *Folia* subobscure viridia, ± anguste oblongo-lanceolata, multilobata, lobis deltoideis ± recurvatis, sursum magnitudine accrescentibus, apicibus ± recurvis, dorso ± convexo, superioribus in margine integris, inferioribus ± denticulatis—dentatis, majis patentibus, infimis parvis, lobo terminali ± sagittato, mediocri integro, marginibus rectis v. medio convexis, apice saepius ± protracto, obtusiusculo v. subacuto, folia interiora latiora, lobis saepe longioribus, dorso dense et acuto denticulatis-dentatis, lobo terminali magno ovato-sagittato, lobis lateralibus recurvis, acutis, mar-

ginibus convexis subintegris v. inferne ± denticulatis v. basi in uno exteriore latere dente majore instructo, petiolis angustis et nervo mediano ± roseo-violaceis. *Involucrum* atroviride mediocri, basi ± ovata. *Squamae* exteriores erecto-patentes v. ± recurvae, late lanceolatae—ovato-lanceolatae, obscure purpureo-violaceae. *Calathium* parvum, 35-40 mm. diametro. *Ligulae* sat obscure luteae, marginales extus stria purpureo-violacea notatae. *Antherae* polliniferae. *Stylus* et *stigmata* lutea. *Achenium* ignotum.

This form resembles in general appearance *T. sagittipatens* Dahlst. from Sweden, but differs from it by its coloured petioles and middle nerves, darker green leaves, small dark heads with purplish-violet outer phyllaries and small flower heads. On the old walls of the Roman Villa, North Leigh, Oxon, 1927, G. C. DRUCE.

446/2. ERICA TETRALIX L., var. Mr R. KEMPTHORNE sends from the Lizard a curious form of this species. It is characterised by the short corolla, half the length of the stigma, the white corolla being four lobed, semi-reflexed and downy, and it has no stamens. As will be seen it combines the characters of var. *alba*, var. *fissa* Dr. and var. *anandra* Rich.

446/7. E. VAGANS L., forma or var. PARVIFLORA. Corolla minute, spreading rather than campanulate, more deeply cut with more acute segments. The Lizard, Cornwall, R. KEMPTHORNE.

471/1. FRAXINUS EXCELSIOR L. Messrs Franklin and Jones (Oxford) state that at their timber auction on Tusmore Estate, Oxon, they sold one of the very few King Ash trees left in this country. It was about 300 years old. The tree had an unbroken height of 55 feet and the quarter girth at 5 feet high was 28½ inches. The trunk appeared to keep this measurement practically to its full height. The contents were estimated to be 260 cubic feet. Mr C. R. Claridge (Exeter) purchased the tree for £65, representing 5s a cubic foot, a more or less unheard of price to-day.

472/3. LIGUSTRUM SINENSE Loureiro. Alien, China. On the edge of a beech clump, near Crab Wood, Hampshire, Rt. Hon. H. TREVOR BAKER. Named by J. FRASER. The pale green, oval leaves, and small black fruits characterise it. It is the handsomest of the deciduous or semi-evergreen privets on account of the profusion of its bloom. It grows from twelve to twenty feet high, with widely spreading branches and a rounded or flat top.

506/1. MYOSOTIS SEROTINA Hülphers. Bladon Wood, Oxon, G. C. DRUCE. See paper by A. E. WADE in this *Report*.

509/7. ECHIUM CALYCINUM Viv. Alien. Inner Farne Isles, Northumberland, ex Miss LUCY RICHARDS, teste J. FRASER.

513/1. CONVOLVULUS ARVENSIS L., forma PICTA. Mr J. F. BOTTERILL sends a form which grows on the banks of the disused canal near Aston Clinton, Bucks. The pale pink corolla is rather small, but at the base of each segment there is a deep purplish-red, well-defined oblong mark. All the flowers were marked alike, and plants were noted in three different places.

Var. INTEGRATA Druce. Mr B. REYNOLDS sends from Mortlake, Surrey, a plant with un-auricled leaves, the blades large, 4.5 cm. × 3 cm. in their largest state, corolla deeply rose-red and white = var. *integrata* Druce. It is near to *obtusifolia* Choisy.—G. C. DRUCE.

515/10. CUSCUTA BREVIFLORA Visiani. Alien, Central America and S. and E. Europe, on various plants. Allied to *C. obtusiflora* H. B. K. This occurred on sugar-beet in a garden in Birmingham. The corymbs of flowers are in loose branched panicles, with shortly stalked flowers. Corolla finely papillose, reflexed after a time; styles two, stigma capitate; calyx as long as corolla tube. Named by J. FRASER.

517/18. SOLANUM ACAULE Bitter, var. SUBINTERRUPTUM Bitter, subvar. CAULESCENS Bitter in Fedde Rep. xi., 391-4, 1912; xii., 453, 1913. Alien, ? S. America. Selkirk, 1916, Miss I. M. HAYWARD. After some years, Dr S. Polgar, through the kindness of Dr Probst, has at last identified the Selkirk *Solanum* as belonging to the above.

527/19. VERBASCUM LONGIFOLIUM DC., non Tenore. Reduced by Thellung to *V. speciosum* Schrad. Herts, J. E. LITTLE. J. FRASER, however, inclines to name it *V. Phlomoides*.

543/8. VERONICA ANAGALLIS-AQUATICA L. × V. AQUATICA Bernh. Tringford Reservoir, Herts, growing with both putative species. Leaves intermediate in shape, 2.1 cm. × .8 cm. The flowers inclined to the blue of *Anagallis*, but were a little smaller and had a distinct tinge of red in them. Plants entirely barren, I. A. WILLIAMS in *Journ. Bot.*, 24, 1929.

543/11. V. SERPYLLIFOLIA L., var. OBSCURA Drabble & Salmon in Journ. Bot., 213, 1929. Freshwater, Isle of Wight; Tarbert, N. Harris, DRUCE. "Herba prostrata, ramis longissimis profuse radicantibus, foliis late ovalis pagine opacis."

543/23(3). V. GRANDIS Fisch. ex Spreng. Neuc Antdeck ii., 122, Alien, Europe (det Rompp.). Near Ambleside, 1866, R. TUCKER.

545. EUPHRASIA. Mr H. W. PUGSLEY read a paper on May 2, 1929, at the Linnean Society on "A Revision of the British Euphrasias." In *Journ. Bot.*, 224, 1929, he gives abridged diagnoses of the new species.

E. ROTUNDIFOLIA nov. sp. = E. LATIFOLIA auct. ang. (ex parte) non aliorum. Melvich, Sutherland, MARSHALL, Ref. No. 1850, partim.

E. MARSHALLII nov. sp. = E. LATIFOLIA auct. ang. (ex parte) non

aliorum. West Sutherland, Caithness, Orkney, MARSHALL, Ref. Nos. 1845, 1850, partim.

E. CAMBRICA nov. sp. Mountains of North Wales, PUGSLEY.

E. PSEUDO-KERNERI nov. sp. = E. KERNERI auct. ang. non Wettstein. Chalk Hills, South of England, PUGSLEY, Ref. No. 447; Reigate Hill, Surrey, C. E. SALMON in *Hb. Brit. Mus.*

E. RIVULARIS nov. sp. Mountains of North Wales, PUGSLEY, Ref. No. 438.

E. ANGLICA nov. sp. = E. ROSTKOVIANA auct. ang. pro maj. parte, non Hayne nec Wettstein. South of Yorkshire, Wales, Ireland. PUGSLEY, Ref. No. 440. MARSHALL, Ref. No. 1826.

545/2. E. BOREALIS Wettstein, var. c. ATROPURPUREA Pearsall, nov. var. Planta compacta, robusta, ramosissima, 5-8 cm. alta. Spica internodiis brevissimis itaque caulis et rami foliis bracteisque celati sunt. Bracteae late ovatae, obtusae, dentibus obtusis. Corolla media omnino atropurpurea. Ref. No. 334. These are stout, compact, much branched plants, often about 6 cm. in height. The leaves have a terminal lobe often broader than long, very obtuse and usually with about 3 obtuse teeth on either side. Bracts broadly ovate, not cuneate-based, and usually with about 4 obtuse teeth on either side. Only the uppermost bracts possess acute teeth. Spikes very congested, with imbricate bracts. All foliage very setose on margins and nerves only. All leaves and bracts wide-based, except the lowermost leaves. Flowers numerous, well-formed, medium-sized and of very striking appearance. They are wholly dark purple with darker rich purple lines on both lips. The capsules are those of typical *Euphrasia borealis* Wettstein, but the distinctive habit and flowers make it quite worthy of varietal status. W. H. PEARSALL. *Locality.*—Ref. No. 334, natural, grassy, sandy pasture at seashore, alt. 15 feet, at the mouth of Green Burn, Sand of Sand, Fetlar, Shetland, July 23, 1929, H. H. JOHNSTON in *Trans. Bot. Soc. Edin.*, 334, 1929. This beautiful dark purple-flowered form was seen by me plentifully in Unst, and also locally on the Mainland.—G. C. DRUCE.

546/4. BARTSIA VISCOSA L., nov. var. BREVIFLORA. Sent by Mrs G. YOUNG, from Buncrana, Donegal. In this plant the calyx is as long or longer than the corolla. In other ways it is normal. G. C. DRUCE.

548/3. RHINANTHUS CRISTA-GALLI L., sub-sp. ELATIOR Soó, var. RAMOSISSIMUS Schur (fide C. E. Salmon). Ref. No. 140. Moist, natural grassy pasture, alt. 45 feet, West Burn of Houbie, Fetlar, Shetland, July 28, 1929, H. H. JOHNSTON. Native. Common. Plants in flower and unripe fruit. Corolla yellow, except the two lateral lobes of the upper lip, which are purple, very blunt, and shorter than broad.

549. MELAMPYRUM. Mr C. E. SALMON in *Journ. Bot.*, 105, 1929, gives the results of the examination of his specimens of *Melampyrum* by Dr Ralph Soó, who has recently written a monograph in *Fedde Rep.* xxiii., 895-957, and xxiv., 47-113, 1926-7.

M. ARVENSE L., sub-sp. PSEUDOBARBATUM (Schur) Wettst. Isle of Wight, v.-c. 10, C. E. S.

M. CRISTATUM L., sub-sp. RONNIGERI Pöverl. Walden, Essex, v.-c. 19, GIBSON; Elmswell, W. Suffolk, v.-c. 26, POWELL; Hardwick Wood, Cambridge, v.-c. 29, ad typum vergens; Monk's Wood, Hunts, v.-c. 31, *Hb. Power*.

M. SYLVATICUM L., sub-sp. SUBULVATICUM Schinz & Ronn. Ribblehead, Yorkshire, v.-c. 64, BEANLAND; Teesdale, Durham, v.-c. 66, MENNELL. This is probably our common British plant.

M. PRATENSE L., sub-sp. OLIGOCLADUM (Beauv.) Soó. Unwell Wood, Berks, v.-c. 22 (proxime *platyphyllum* Beauv.); Mallaranny, Co. Mayo, MARSHALL (sub-sp. *hians* Druce, f. *britannicum* Beauv.).

Sub-sp. PURPUREUM Soó, f. SCOTIANUM (Beauv.) Soó. Schiehallion, HAGGART; Sow of Athol, C. E. S., M. Perth, v.-c. 88; Carn Liath, Westerness, v.-c. 97, [4261], MARSHALL. A change of grades rather than new forms.

Sub-sp. HIANS (Druce) Beauv. Kincraig, Easterness, v.-c. 96, 1891, SOMERVILLE, previously seen by me; Vale of Avoca, Wicklow, 1835, J. W. CURTIS.

Forma PLATYPHYLLUM Beauv. Porlock Weir, S. Somerset, v.-c. 5, 1898, C. E. S.

Forma BRITANNICUM Beauv. Winch Bridge, N.W. Yorkshire, v.-c. 65, 1911, C. E. S.

The raising of the grade from vars. to sub-species by Beauverd, with the various varieties, will be seen in *Rep. B.E.C.*, 66, 1917, in my review of Beauverd's Monograph, as well as other varieties of *M. pratense*. One remembers with a smile the verdict of the then Editor of the *Journal of Botany*—"There was nothing in *hians* worth notice," and the curt refusal to print it. This led to its being originally published in the *Naturalist*.

As long ago as *Rep. B.E.C.*, 186, 1887, I recorded *hians* from Logie, Nairn; Wigtown; Northumberland; Cumberland and Westmorland; and from Elgin; Salop; Easterness in the *Naturalist*, 226, 1888.

558/12. MENTHA RUBRA × VERTICILLATA Fraser. Talgarth, Radnor, DRUCE; Fyvie, N. Aberdeen, Rev. F. TURREFF. Det. J. FRASER.

561/11. THYMUS BRITANNICUS × CHAMAEDRYS (GLABER) = T. LANSDOWNEIAE Druce. "Liegende Stengel zum Teil mit Blattbuscheln, zum Teil mit Bluten standen abschliessand Bluhende." Aste ea 5 cm. lang, bis oben exakt goniotrich, Haare serr kurz und retrors, Blatter Klein, schmal elliptisch, von diiemer Consistenz, beiderseits sparlich behaart, am Raude von der Basis bis zur Mitte oder daruber geuvinpert Seiten Nerven nicht vortretend, Kelsh ± 7 mm. ringsum zottig, ob Kelshzahue kurz dreicskig. Of the prostrate shoots, some end with whorls of leaves, others terminate in inflorescences; the flowering branches are about 5 cm. long, exactly goniotrichous to the top, the hairs are very short and retrose. Leaves small, narrow, elliptic, of thin

texture, sparsely hairy on both surfaces, margin ciliate for half or more of its extent; lateral nerves not prominent. Calyx ± 7 mm., villous all round; upper calyx teeth short triangular. At Dr Ronniger's suggestion I apply a name to it as THYMUS LANSDOWNEIAE, as I found it in July last with the Marchioness of Lansdowne, on the down Blackland, above Bowood, Wilts, and also later on in the month at Selsea Common, Gloucestershire, G. C. DRUCE.

572/4. SCUTELLARIA COLUMNAE Tenore. Halac. Fl. Graec. ii., 493. Archangeli, 438. Tab. in Sweet Gard., n. 52. Stem erect, simple or slightly branched, the lower part shortly hairy, the upper part, bracts and calyces villous-glandular, the stalks hairy; leaves pubescent, truncate or subcordate, ovate or oblong-ovate, largely and coarsely crenate. Raceme loose, elongate, bracts slightly stalked, ovate, acute, entire. Corolla arcuate (20-28 mm.), bluish-purple, with white tube, glandular-pubescent. Nuts granulate, with stellate hairs. In June 1929, the Rt. Hon. H. TREVOR BAKER sent me a plant which he had found in a wooded glen near Mells, Somerset. He said there were three or four plants growing among herbage near a pathway. There were no houses within 300 yards, and the nearest were only described as ruined cottages, about which the plant could not be seen. He took me from Bowood to see it, and I found it as he described. The track runs along the base of a wooded valley. However, in looking up the side, about 300 or 400 feet above the track, in quite a wild place without adventives, there was a large patch, 50 yards or more across, of the same species. The plant is mainly found in South Italy and Greece, extending also to Macedonia, Serbia, Hungary, Slavonia, and Banatia. It has also become naturalised in the neighbourhood of Paris.

596/2. AMARANTUS HYBRIDUS L., cf. var. PATULUS (Bertol.) Thellung. Dagenham, Essex [2830], R. MELVILLE.

600/8. CHENOPODIUM ALBUM L., var. DIVERSIFOLIUM Aellen. Avonmouth, W. Gloster, C. SANDWITH, teste AELLEN.

Var. MULTOSPICATUM Aellen. Avonmouth, W. Gloster, C. SANDWITH; Didcot, Berks, G. C. DRUCE, teste AELLEN.

Var. MINUTO-SPICATUM Aellen. Avonmouth, W. Gloster [10], C. SANDWITH and J. GIBBONS.

600/8. C. ALBUM × FICIFOLIUM = C. ZAHNII Murr. Skipwith, N. Yorks, August 1929, G. C. DRUCE.

600/8g. C. SUECICUM Murr = C. PSEUDOPULIFOLIUM (Scholz) Murr in Hayward and Druce Adv. Fl. Tweedside, 190, 1919. Jericho allotments, Oxford, 1893; Selkirk, 1913, G. C. DRUCE, teste AELLEN.

600/11. C. LEPTOPHYLLUM (Nutt.) Britton & Brown. Hovingham, N. Yorks, August 1929, G. C. DRUCE, teste AELLEN.

Var. c. LEPTOPHYLLOIDES (Murr) Thell. Near Brighton, Sussex; Port Talbot, Glamorgan; Rye House, Essex; Par, Cornwall; St Cyrus, Kincardine, G. C. DRUCE, teste AELLEN.

600. C. ZOBELII Ludv. et Aellen. Galashiels, Selkirk, G. C. DRUCE and Miss I. M. HAYWARD, teste AELLEN.

600. C. PROBSTII Aellen. St Philips, Bristol, 1916, as *Berlanderi* × *album*, G. C. DRUCE, teste AELLEN.

600/20. C. STRIATUM (Krasan) Murr. Dr Probst writes me (24/3/29) that he has found that *C. strictum* of Roth Nov. Pl. Sp., 180, 1821, precedes *striatum* as the correct name. Roth's original plant is at Berlin.

600/21. C. HIRCINUM Schrad., sub-sp. MILLIANUM Aellen, var. QUINOA (Willd.) Aellen. Galashiels, Selkirk, Miss I. M. HAYWARD, as *C. paniculatum* in *Adv. Fl. Tweedside*, 193, 1919.

600/31(2). C. GIGANTEUM Don Prod. Fl. Nepal., 75, 1825. Coste and Reynier, 1907. Aellen in Fedde Rep. Spec. Nov., xxvii., 201, 1929, and Ber. Schweiz Bot. Gesell., xxxviii., 1929. Sabinal, Weston, Somerset, T. H. GREEN in *Herb. Druce*; Galafoot, Scotland, 1926, Miss I. M. HAYWARD.

615/11. POLYGONUM MINUS × PERSICARIA = P. BRAUNEANUM Schultz. Binsey Common, Oxon, with both parents, September 1929, G. C. DRUCE, teste Dr DANSER.

615/19. P. PATULUM M. Bieb., sub-sp. KITAIBELIANUM Danser. Boston, Lincs, July 1928, G. C. DRUCE, teste Dr DANSER.

618/4. RUMEX ELONGATUS Gussone. Have we this in Britain? This was first brought to the notice of British botanists by Dr H. TRIMEN in *Journ. Bot.*, 237, 1873. He had not seen type specimens, but the Thames plants between Putney and Hammersmith Bridge agreed, he thought, with the description in Gussone's *Plantae Rariores*. The leaves were not crisped, perfectly flat, 8-12 in. long, 1 in. wide, and much attenuated at the base into a long petiole. Subsequently the Rev. A. LEY recorded it from the Wye-side near Chepstow. Recently I sent to Dr Danser, in Java, my Tintern specimen, 1900, which the Rev. A. Ley passed as *elongatus*, but Dr Danser says it is only a form of *crispus*. To this species he also refers the *elongatus* [2199] of Mr C. E. Britton, from between Hammersmith Bridge and Putney, June 1920. Mr Britton says his specimens are quite identical with those gathered by Dr Trimen. Dr Danser says "Forms like this also grow in Holland, on the banks of rivers." Are these the *planifolius* Schur? G. C. DRUCE.

618/9. R. CONGLOMERATUS × MARITIMUS = R. LIMOSUS Thuill. Skipwith Common, Yorks, August 1929, G. C. DRUCE, teste Dr DANSER. Practically new to Britain. Another hybrid of the same parents, *R. Knafii* Celak., is on record. Our own *palustris* Smith is a species, and was confused with *limosus*.

618/13. R. MARITIMUS × PALUSTRIS = × R. HENRARDII Danser. Boarstall, Bucks, September 1929, G. C. DRUCE, teste Dr DANSER. A new hybrid to Britain.

628/10. E. ESULA L. Extract of p.c. from Dr Thellung, September 14, 1919:—*E. Esula* L.—Foliorum margo subtilis et tenuis, subrevolutus, apicem versus denticulatus. Folia semper ± oblanceolato = subspathulata, apicem versus latiora. *E. virgata* W. & K.—Foliorum margo anguste hyalinus rigidus, planus, subintegerrimus. Folia, quoad forma, variabilia, saepius a medio ad apicem longe attenuata, rarius. (f. *esulifolia* Thell.)—Supra medium latiora et inde eis *E. Esulae* valde similia.

637/1. URTICA DIOICA L., var. f. INCISA Dr. in Rep. B.E.C., 307, 1921. *The Chemical Nature of the Poison of Stinging Nettles.*—The fact that, for a single experiment, it has been necessary to isolate the urticating hairs from 100 kilos of fresh nettles to obtain 40 grms. of material, and that 100 of these hairs weigh about 1 milligramme, gives an idea of the amount of labour and patience the investigations briefly summarised have required. The urticating hairs of *Urtica dioica* have a protoplasm with an alkaline reaction which encloses an acid cell sap, in which a small amount of formic acid is accompanied by acetic, butyric, and other volatile fatty acids. It also contains the real poison. This is a non-volatile unsaturated acid substance containing no nitrogen. It is allied to the resin acids. Nettle poison is, therefore, neither formic acid, nor an enzyme, nor a toxalbumin. It is undoubtedly allied to the irritant substance of the Primulaceæ and of *Rhus Toxicodendron*. Less than 0.0001 milligramme of nettle poison will react on the human skin. Probably the irritant substance of some members of the N.O. Loasaceæ also belongs to the same chemical and pharmacological group.—F. Flury in *Zeits. Exper. Med.*, 1927, 1, 56.

644/1. CARPINUS BETULUS L., var. INCISA Aiton. Found originally by Aiton (*Hort. Kew.* iii., 263, 1789). This year it was found near Leatherhead as a tree about 50 feet high, "probably planted there some years ago." The Norwegian Maple, too, is in the vicinity. H. J. BURKILL in *Lond. Nat.*, 61, 1928.

650/15. SALIX LANATA × LAPPONUM. This is discussed in *Gard. Chron.*, 107, 189, 208, 231, 1928. Mr Chittenden says he had it from the garden of Dr Stuart of Chirnside and it was distributed under the hortal name of var. *Stuartii*. Mr Fraser identifies it as a hybrid, *lanata* × *lapponum*, included with a query in our *List*. There seems no reason to question Mr Fraser's determination, therefore we should write

S. lanata × *lapponum* = × *Stuartii* (Hort.) nov. hybrid. This is not identical with *Salix Stuartiana*, which was named by Smith after an earlier Dr John Stuart who sent, from his garden at Luss, specimens to Smith. Moss reduced the Luss plant to type *lapponum* (of which it seems only a form) in the *Cambridge Flora*.

658/1. HYDRILLA VERTICILLATA (L. f.) Presl, var. POMERANICA (Reichb.) Dr. Mr F. W. Branson tells me that he feels quite certain that a specimen flowered under the following conditions in his garden near Leeds. Inside a metal box about 5 × 2½ and 1 inch deep some specimens were planted with mud, and one plant flowered and showed evidence of fruiting, due, he thinks, to the fact that they were in a warm corner of his garden, no lid being on the box. Showers prevented the mud from drying.

669/8. ORCHIS PRAETERMISSA Druce, forma VIRIDESCENS. Sent by Mr ERIC TAVERNER, June 1929, from between Glyndyfrdwy and Berwyn, Denbigh. Spike very dense, inflorescence short, bracts very long, twice the length of the greenish-purple flowers.

Forma BRACTEATA Druce. A plant sent from near Holsworthy, N. Devon, 2 feet high, strongly bracteate (up to 1¼ inch).

669/17. O. PYRAMIDALIS (ANACAMPTIS) × HABENARIA GYMNADENIA. Near Easington, Durham, in a mixed colony of the two parents, J. W. HESLOP-HARRISON in *Vasculum*, 158, 1928.

674/4. Hybrid Orchids. A further note on the hybrids between HABENARIA VIRIDIS and ORCHIS. In a note published in the 1928 *Report*, I gave my reasons for supposing that only one or possibly two hybrids between *Orchis* and *H. viridis* should be admitted to the British List. (1) The plant for which I then proposed the name × *O. Ullmanii*, and possibly (2) the hybrid *O. Fuchsii* Druce and *H. viridis* L. I also gave reasons for supposing that the plant figured in plate 15, *Supplement to B.E.C. Report* for 1917, which had been identified by the Winchester botanists as *O. Fuchsii* Druce × *H. viridis* L., was in reality *O. Fuchsii* Druce × *Habenaria conopsea* (L.) Br. I am indebted to Mr Carry Gilson for pointing out to me that I overlooked one important point in Mr McKechnie's original description of this plant. The presence of a yellow spot on each side of the labellum indicates *H. viridis* rather than *Habenaria*. In view of this and the fact that several botanists who had the advantage of examining the living plant were unanimous in their diagnosis, the second hybrid, *O. Fuchsii* Druce × *H. viridis* L., may, I think safely be included in the List. P. M. HALL.

678/6. CROCUS ZONATUS J. Gay. Alien, Asia Minor. Mr F. CLARKE kindly tells me that he found "8 specimens in a wild state, not near houses or gardens, among grass, on the edge of a wood at Shackleford, Surrey, in last October. There were also two more in the vicinity but some little distance from the others." Named at Kew. Do we owe this

to a disciple of Maurice Hewlett? The Crocus is one of those sold by the Dutch bulb-growers, at about 6d each. In "The Genus Crocus," Maw figures it on t. iv., and says it is a high alpine species (first found by Kotschy), limited to the mountains of Cilicia and the Lebanon, up to 8000 feet. The rosy-lilac flowers with bright golden throat are remarkably beautiful.

684/1. NARCISSUS PSEUDO-NARCISSUS L., forma MCLACHLANII Druce. In this plant the corona, instead of being tubular with spreading lobes and open mouth, is barrel-shaped, and the mouth is narrower than the body. Meadow Dymock, Gloster, June 1929, Dr JOHN MCLACHLAN. G. C. DRUCE.

688/1. TAMUS COMMUNIS L., var. vel forma TRILOBATA Dr. Leicester, G. J. V. BEMROSE. Leaves three-lobed, the lateral lobes 4 cm. long from midrib, rounded at apex; the centre one 9 cm., narrowly acuminate.

706/3. SCILLA NON-SCRIPTA H. & L., var. LACAILLEI (Corbière). In examining the set of *Scilla non-scripta* of the *Herbarium Kewense* that was kindly sent me on loan, I was not much surprised to come across specimens with "flowers white and perianth long and narrow," to quote the collector's remark, found in Kent, near Shoreham, May 2, 1926 (W. B. Turrill). These accompanied the *albiflora* form with normally shaped perianth and there were but a few of each plant scattered amongst thousands of ordinary blue ones.

Under the name *Endymion Lacaillei*, Prof. L. Corbière (*Nouvelle Flore de Normandie* (1893), p. 574) made the following description of a new sub-species of *Endymion nutans* Dumort. (=*Hyacinthus non-scriptus* L.):—"Diffère de *E. nutans* par sa floraison de 15 jours plus tardive; ses fleurs blanches, inodores ou à odeur très faible ne rappelant en rien celle de la Jacinthe; un peu étalées ou arquées en dehors au sommet, mais non recourbées; à partie tubuleuse bien plus allongée et plus étroite, sensiblement rétrécie au sommet, un peu arquée (longr. 15-18 mm.; plus grand diam. 4-5 mm.). Dans *E. nutans* cette même partie tubuleuse a 12-13 mm. de long et son plus grand diam. 6-7 mm."

This plant was found near Bolbec (Seine-Inférieure) by J. A. Lacaille who, from the information I obtained but a few years ago, did cultivate it to make certain that the characters would be maintained; thus the precision that it flowers fifteen days later than the species. (Lacaille died in 1912.)

Rouy (*Flore de France* xii. (1910), p. 429) reduces *E. Lacaillei* to the *race* rank and does not add any new locality to the original one. (A typographical error is to be corrected in Rouy's flora: "larg. 12-13 mm." instead of 12-43 mm.).

I did not find any other record whatever in French publications and it seems that the plant has passed unnoticed ever since until a few specimens were found again in Seine-Inférieure—Bec-de-Mortagne, April 22, 1923, and May 4, 1924 (Ch. Broemse). Owing to the dimensions of

perianths being slightly less than those given in the original description, they were submitted to Prof. Corbière, who confirmed the name as correct, adding that his *Lacaillei* was perhaps only a variety, but a notable one.

I tried at the time to match the above with the original type, but there is not such a reference in Lacaille's herbarium which is preserved in Rouen. (Cf. P. Senay: *Endymion Lacaillei* Corb. in *Bull. Soc. Linn. Seine Marit.* (1923) p. 111, 112, 120).

A few specimens were found at Tourville-les-Ifs, April 11, 1926 (P. Senay), not far from Bec-de-Mortagne, and were even more characteristic than those of this locality.

After repeatedly calling my friends' attention to this plant, it still remained unrecorded outside the Havre district, and for a while I wondered whether it was not a local variety. I had even thought it might be some micro-endemic in the process of disappearance, but I abandoned the hypothesis after seeing four specimens gathered near Havre, at Gainneville, May, 1925 (G. Férée d'Arcour) and which, from the dimensions of their perianths, were intermediate between *E. nutans* and *E. Lacaillei*.

The discovery near Paris, in the forest of Meudon, May, 1927 (M. Debray), of a few specimens coming more under *E. Lacaillei* than the species largely extended the geographical area of this variety which, therefore, was no longer exclusively Norman. It has been shown above that neither was it strictly French and this may incite botanists to look for it in England, where the wild hyacinth is not an uncommon sight.

My friend's conclusions (Cf. M. Debray: *A propos d'Endymion Lacaillei* Corb. in *Bull. Soc. Linn. Seine Mar.* (1927), 99, 100) is that, besides the other characters, the difference lies more in the relation between the length and diameter than in their respective sizes, the ratio being > 3 to 1 for *E. Lacaillei* and < 2 to 1 for *E. nutans*. But we have seen that intermediate forms occur and therefore one may conclude that the true *Lacaillei* is neither a sub-species nor a race, but the extreme of a series leading to this variety of which the Shoreham specimens (19 flowers) are the most typical ever seen by the writer.

Hybridity is out of the question, the pollen of all the specimens mentioned in this note being perfect.

By the way the correct name, for those who do not admit the genus *Endymion*, should be *Scilla non-scripta* (L.) Hoffmg. & Link, var. *Lacaillei* (Corb.) Senay comb. nov.

We have seen that its main characteristic lies in the perianth being longer and narrower than in the species. As a matter of fact, the slenderness of the flowers is striking and the plant is easily recognisable once one has seen it alive while it does not appear so neatly on the dried material. Not less striking is the colour of the flowers, which are pure white (like those of *Convallaria majalis* L.) while they are white with a bluish hue, sometimes variegated, in the *albiflora* form (or subvariety) of the species. I even have a specimen (Tourville-les-Ifs) of

E. Lacaillei with one rudimentary flower greenish* at the apex, exactly like *Polygonatum multiflorum* All. (The fruit is in normal state of development).

It remains to find a blue-flowered variety morphologically parallel to *Lacaillei*. I have examined thousands of flowers and was unable to detect such a specimen so far.

DIMENSIONS OF PERIANTHS.

	Original Lacaillei (Bolbec).	(Bec-de-Mortagne)	(Tourville-les-Ifs).	(Forêt-de Meudon.	(Gainneville) 4 specimens.		Shoreham 19 flowers.
Length,	15-18 mm.	12-15 mm.	15-17 mm.	9-14 mm.	7-9	10-11	15-18 mm.
Greater diameter,	4-5 mm.	3-4 mm.	4-5 mm.	3 4 mm.	3-5	4-5	3-5 mm.
Ration (†),	3.66 / 1	> 3.5 / 1	3.7 / 1	3.5 / 1	1.8 / 1	> 2.4 / 1	> 3.8 / 1

1 flower
14 × 3
4.6
= ——
1

11-12 10 11
4-5 3-3.5
2.6 3.3
—— ——
1 1

(†) Average of all the flowers.

PIERRE SENAY.

In my herbarium M. Senay detects *Lacaillei*, gathered by me at Brickhill, Bucks, in 1898; Mickleton Wood, *E. C. Townsend*, 1844 (? Gloster), and tending towards it from Beardsall, Derby, 1845, coll. *Ansell*. G. C. DRUCE.

718/16. JUNCUS TENUIS Willd. This name, as used for the plant found in the British Isles, is not correct. K. M. Mackenzie (*Bull. Torrey Club*, 25, 1929) says that Willdenow's plant has "vaginis adpressis ore nudis." The earlier name for our plant seems to be *J. bicornis* Michx. Fl. Bor. Am., i., 191, 1903 (earlier than Smith's *gracilis* E. B. 31, t. 2174, 1810, non Roth, 1788). The next name to *bicornis* (should that not be available) is *J. macer* S. F. Gray Nat. Arr., ii., 164, 1821. *J. tenuis* Willd. Sp. Fl., ii., 214, 1799 = *J. dichotomus* Ell. Bot. S. Carol. and Georgia, 406, 1817. Our plant should therefore stand as *J. bicornis* Michx. (vel emend. Ellcott).

737/13. POTAMOGETON LUCENS × PERFOLIATUS = × P. KUPFFERII A. Bennett in Journ. Bot., 103, 1928. Grand Junction Canal, near Bone Mill, Market Harborough, Leicester, G. CHESTER. = P. LONGIFOLIUS Gay × PERFOLIATUS Kupffer Asch. & Graebner in Engl. Pflanz. iv., 2, 137; Hagström Crit. Res. Pot., 245. *P. decipiens*, f. *memelanus* Hagstr., 245. I could only see ordinary *decipiens* in the Canal there last August, and even Bennett's own specimen does not appear to be identical with the original description.

*The cyanic series being green, bluish-green, blue, purple, red and pink, would not certain flowers return accidentally to some ancestral coloration?

753/7. CAREX INFLATA Huds., var. (*monstrosa*) ZYGOSTACHYA Druce. Found near St Austell's, Cornwall, in 1928, growing on the top of a hedgebank, as a clump thrown up from the neighbouring ditch, by Mr WILLIAM TRESIDDER. The inflorescence is mixed, male and female, and compound. G. C. DRUCE.

753/46. C. GRACILIS Curt., var. GRACILESCENS Almq. C. E. SALMON (*Journ. Bot.*, 333, 1929) states that Kükenthal has said that specimens labelled as above he refers to his *angustifolia*. These were collected near Ilkley. See *Rep. B.E.C.*, 402, 1928, where the specimens are referred to as *gracilescens*. Kükenthal says *C. gracilis* Curt., var. *gracilescens* Almq. is unknown to him. It is not mentioned in Hartmann *Handb. Skand. Flora* nor in Neuman *Sveriges Flora*. Salmon says he has been "equally unsuccessful in finding any reference to this mysterious variety: it had better be deleted from the 'London Catalogue.'".

The var. *gracilescens* Almquist was first introduced into British Botanical literature by Arthur Bennett in *Rep. B.E.C.*, 384, 1891, as *C. acuta*, var. *gracilescens* Almquist from Bala. E. F. Linton sent specimens to the Club in 1893 from Christchurch, Hants. There are many notices of it in our Reports. In *Rep. B.E.C.*, 403, 1908, it was recorded (see above) from Ilkley, and there I pointed out that Kükenthal did not refer to it, even in synonymy. *In Rep. B.E.C.*, 170, 1914, Bennett again alludes to it and says of my Northamptonshire specimens that "they agree very closely with specimens so named for me by Dr Almquist." The question arises whether this is only a MS. name or whether it has been published by Almquist. We have a definite fact that Almquist named Cambridge plants var. *gracilescens*, and this may precede Kükenthal's name *angustifolia*. My memory has it that Lange also used *gracilescens* Almq. for one of my English plants. I was making a close study of *gracilis* in the early nineties, and I see in *Fl. Berks*, p. 541, that I used var. *gracilescens*, and said that I distributed it through the B.E.C. in 1892. I may add that Stewart used the name *C. acuta*, var. *gracilis* Uechtritz (*Rep. B.E.C.*, 97, 1883), but mistakenly for the plant he had under review was *C. aquatilis* not *acuta*. On present knowledge I shall allow it to remain in my *List*.—G. C. DRUCE.

827/19(2). BROMUS BRITANNICUS I. A. Williams in Journ. Bot., 65, 1929. Syn. *B. hordeaceus*, var. *pseudo-racemosus* Druce in Hayward's Botanist's Pocket Book Suppl. Mr Williams, emphasising the distinguishing characters, lays stress on the upper pale being much shorter than the caryopsis and ciliate up about two-thirds of its length only. Caryopsis, as it comes to maturity, reaches quite or almost to the top of the lower pale, the tuft of the whitish hairs at the top of the caryopsis being eventually easily visible in the sinus between the points of the lower pale or projecting beyond them. Spikelets small, 10-11 mm. long, 4-5 mm. broad; in *hordeaceus*, 50-100 per cent. longer. It has been recorded from Par, E. Cornwall, MEDLIN; Tickenham, N. Somerset, 1915, Miss ROPER; Warminster, S.

Wilts, 1903, E. S. MARSHALL, *Hb. Brit. Mus.*; Frensham, N. Hants, I. A. WILLIAMS; Rottingdean, E. Sussex, T. HILTON, *Hb. Kew*; Eynsford, W. Kent, 1895, E. S. MARSHALL, *Hb. Brit. Mus.*; Betchworth, Surrey, 1867, J. L. WARREN, *Hb. Brit. Mus.*; Wanborough, Surrey, 1867, etc., WATSON, *Hb. Brit. Mus.*; Finsbury Park, Middlesex, 1871. A. FRENCH, *Hb. Brit. Mus.*; Flitcham, W. Norfolk, 1926, HUBBARD, *Hb. Kew*; Dowdeswell, E. Gloster, 1836, W. BORRER, *Hb. Kew*; Hatchmere, Cheshire, 1921, ADAMSON, *Hb. Brit. Mus.*; Thirsk, N.E. Yorks, 1864, BAKER; Meanwood, M.-W. Yorks, 1914, F. A. LEES; Brampton (type specimens), Cumberland, 1928, I. A. WILLIAMS; Glen Clova, Angus, 1904, E. S. MARSHALL, *Hb. Brit. Mus.*; Tomintoul, Banff, 1905, E. S. MARSHALL [2881]; Deerness, Orkney, MAGNUS SPENCE.

My own attention was first directed to this form by beautiful fresh specimens which were sent to me by Mr Fraser of Leith, which he had gathered in Mid-Perth. At the time I was very occupied and sent them with some other grasses to one of the National Herbaria, where they were named *B. mollis*, var. *pseudo-racemosus* (Asch. & Graeb.) I then vainly tried to obtain authentic examples of that variety. It seems to me to well deserve the grade given to it by Mr Williams.

844/7(2). EQUISETUM OCCIDENTALE (Hy) Coste. Pour abréger, je présenterai sous forme de tableau, comme pour la précédente, les variétés et formes de cette espèce observées dans l'ouest de la France, me bornant à signaler tout d'abord une race dominante qui semble le seule répandue dans cette région et contraste avec le véritable *hiemale* de l'Est par les caractères suivants:

E. HIEMALE GENUINUM.	E. HIEMALE, var. OCCIDENTALE Nobis.
Gaînes courtes, à dents toujours caduques; entrenoeuds gros et distinctement renflés en leur milieu; tubercules siliceux de la carène proéminents et sur deux rangées régulières; tige robuste, très rude.	Gaînes plus longues, à dents caduques ou persistantes; entrenoeuds plus étroits et plus allongés, peu ou point renflés au milieu; tubercules siliceux peu proéminents et confluents en bandelettes transversales; tige aussi élevée, mais bien plus grêle.

En outre, dans la plante de l'Ouest, les faisceaux de sclérenchyme ne s'avancent pas aussi loin en profondeur vers le cylindre central, et ils en demeurent séparés par deux assises de larges cellules de parenchyme. Sa propension à varier doit être aussi plus grande, au moins sous le rapport de la ramification, car il serait inexact de lui appliquer la phrase suivante de Duval-Jouve, qui a pu dire de la plante de l'Est: " A l'état normal cette espèce est absolument sans rameaux, et c'est encore aller trop loin que de dire avec M. Grenier ' tiges nues et rarement subrameuses.' "

C'est le type de l'espèce que l'on trouve distribué habituellement dans les exsiccatas, qu'il suffise de citer les suivants:—Société Dauphinoise, n. 1913 bis (1878); Société Rochelaise (1879).

Rouy, Flore de France, Tome 14, p. 503.

a. GENUINUM A. Br. in Flora, 1839, p. 308; Hy, *l.c.*, p. lxi.—Tiges robustes, très rudes, à entrenoeuds renflés au milieu; gaînes courtes; tubercules siliceux de la carène saillants, et régulièrement bisériés.

b. OCCIDENTALE (Hy, *l.c.*, p. lxi., excl. var. *viride* Milde, et in Bull. Soc. Rochel., 1891, p. 57, pro parte) Nob.—Exs.: Rochel., 2969.—Tiges aussi élevées que chez a., mais bien plus grêles, à entrenoeuds plus allongés, peu ou point renflés; gaînes moins courtes; tubercules siliceux de la carène peu proéminents et confluents en bandelettes transversales.

Coste, Flore de la France, vol. iii., p. 714.

EQUISETUM OCCIDENTALE Hy (*E. trachyodon* Bor., non A. Br.).—Sous-espèce du précédent [*hyemale*]. Plante vivace de 50 cm. à 1 mètre, à *tiges* assez grêles, non renflées entre les noeuds, moins rudes, *à côtes planes*, simples ou parfois plus ou moins rameuses; *gaînes cylindriques, sensiblement plus longues que larges*, étroitement appliquées, *à dents caduques* ou souvent persistantes et scarieuses, *à carène parcourue par un sillon bien marqué, mais pourvue de tubercules peu proéminents et confluents* en bandelettes transversales.

Varie à côtes convexes, gaînes un peu dilatées (*E. paleaceum* Schleicher).

Lieux sablonneux humides, surtout dans l'Ouest et le Centre.—Europe occidentale et centrale. Avril-Septembre.

Mais cette plante ne semble pas exister dans l'ouest de la France, ou, du moins, elle doit y être fort rare; car je ne l'ai jamais observée sur place, ni vue de cette provenance dans aucun herbier M. Foucaud m'a communiqué des échantillons fort nombreux recueillis dans toute la région du littoral, et aucun d'eux ne s'y rapportait.

Ses localités les plus rapprochées, à ma connaissance, sont l'Auvergne et les environs de Paris; il serait intéressant de chercher la vraie limite occidentale de ce beau type des pays froids.

Il y aurait un égal intérêt à déterminer jusqu'où s'avance dans la direction de l'est l'autre plante plus grêle et moins rude, qui empiète assez loin sur le domaine de sa rivale, puisque j'en ai vu de beaux specimens de Suisse et des bords du Rhin. J'incline à croire que les diverses variétés décrites par Milde dans ses "Filices Europae" appartiennent à cette race plutôt qu'au vrai type, mais cette présomption ne reposant que sur les descriptions incomplètes données par l'auteur allemand, aurait besoin d'être vérifiée sur des échantillons authentiques. Cette variété, du reste, a souvent été prise pour le type et distribuée en divers exsiccatas. Citons: Mougeot et Nestler, Stirp., n. 302, pr. p. (échantillon de droite, dans mon exemplaire); Billot, n. 2191 (un des échantillons appartient au type, l'autre à dents persistantes et scarieuses aux bords est la var. *Doellii*); Magnier, Flora select, 1346.

Les variétés observées dans l'ouest de la France peuvent se subordonner comme suit:—

A. Dents des gaînes caduques; tige robuste de 15 à 30 côtes.
   a. Tige simple, ou un peu rameuse seulement apres mutilation, ... Form *normalis*.
   b. Tige rameuse, sans mutilation, ... Form *ramigera*.
   c. Tige très rameuse, à rameux très allongés, capillaires, Form *capillaris*.

B. Dents persistantes, au moins sur les gaînes supérieures de la tige, souvent rapprochées et soudées plusieurs ensemble, non sillonnées; plante très grêle (7 à 12 côtes), ... Var. *viride* Milde.

Our *E. occidentale* has been compared with specimens distributed in Dorfler's Herbarium, 4193, from Gallia, Basses-Pyrenées, secus quam quae ducit ad " Sanctae Anna " prope Hendaye, July 1900, leg. E. J. Neyraut. They seem identical, and we may safely call it *E. occidentale*.

Its history is curious. When I was staying at the Ridgeway with Lady Victoria Russell, in September 1912, I noticed growing out of the loose gravel of a pathway a barren *Equisetum*, which I thought was *hyemale*, and, on making a section, felt I could only refer it to that species which was already recorded for Surrey but which had not recently been found there. I sent Lady Isabel Browne, who wished to obtain cones of *hyemale*, to visit it, but she was never able to find cones. Lady Davy who, with others, had seen *hyemale* in 1928 at Weston-super-Mare, went to the Ridgeway this year and saw the *Equisetum*, which she told me seemed different from the Somerset species. So I went over with her, and found in the seventeen years which had elapsed since I first found it that the plant had spread much, not only on the paths, but into the adjoining garden and even into the adjacent field, and was in more luxuriant growth. It was clearly distinct from *hyemale*, and on reference to the Abbé Coste's *Flore de France*, we found he described and figured it on t. 4351, raising it from the varietal grade originally given to it by the Abbé Hy to full specific rank. Its habitat is Europe, occidental and central, growing in moist sandy places throughout the west and central France. It was mistaken by Boreau for *E. trachyodon*. The question is as to its indigenity. The garden was laid out by Lord Arthur Russell from a wild piece of grass-land, and my assumption, on first seeing it there and identifying it as *hyemale*, was that it might have been a native occupant of the soil, and had pushed its way through the gravel pathway. But it must be remembered that Lord and Lady Arthur Russell brought many roses and other plants from France, and some roots of the *Equisetum* may have found their way to this place with the soil. Until it has been found in a natural habitat we cannot claim it as a British species, but its occurrence in this garden should stimulate workers to make a minute search in the stations for which *hyemale* is recorded. I have searched the National Herbaria but only *hyemale* is shown in them. *Hyemale* is the species growing near Cardiff, Weston-super-Mare, Boat of Garten, etc.

E. occidentale may be easily recognised and distinguished by the stem between the nodes being cylindrical, not, as in *hyemale*, widest in the middle; by its colour being yellowish, not bluish or ashy green; by its greater flexibility, less harshness, and brittleness of texture, and by its taller, rather drooping (not stiff, erect), habit. G. C. DRUCE.

NOTES ON PUBLICATIONS, NEW BOOKS, ETC., 1929.

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

AELLEN, PAUL. Beitrag zur Systematik der Chenopodium-Arten. Amerikas Vorweigend auf grund der Sammlung des United States National Museum, Washington, DC. Fedde Rep., vol. 36, 31-64, 1929.

The localities of 21 species, and numerous varieties are cited. They include:—1. *C. Ambrosioides* L., with var. *suffruticosum*, var. *anthelminticum*, sub-sp. *chilense*, var. *denudatum* (Phil.) Aell., var. *andicola*, var. *querciforme* (Murr) Aell., sub-sp. *Burkartii* Aell., sub-sp. *obovatum* (Moq.) Aell., sub-sp. *retusum* (Juss.) Aell. 2. *C. Botrys*. 3. *C. foetidum*. 4. *C. incisum*. 5. *C. aristatum*. 6. *C. bipinnatifidum*. 7. *C. bonariense*. 8. *C. crassifolium*, with var. *Degenianum*. 9. *C. macrospermum*. 10. *C. frigidum*. 11. *C. capitatum* (*Blitum*). 12. *C. virgatum* (*Blitum*). 13. *C. californicum*. 14. *C. antarcticum*. 15. *C. mexicanum*. 16. *C. glaucum*, with sub-sp. *salinum*, sub-sp. *pulchrum*, sub-sp. *ambiguum* (R. Br.). 17. *C. rubrum*. 18. *C. Parodii*. 19. *C. carinatum* (R. Br.) 20. *C. Berlandieri*, with sub-sp. *Zschackei* (Murr) Zobel, sub-sp. *platyphyllum* (Issler) Murr, sub-sp. *Ludwigianum* Aell., sub-sp. *pseudopetiolare* Aell., sub-sp. *Esanae* Aell., sub-sp. *Boscianum* Aell. 21. *C. Bushianum* Aell.

Fedde Rep., 119-161. Additional species of Chenopodium:—22. *C. macrocalycinum* Aell. 23. *C. arizonicum*. 24. *C. Watsoni*. 25. *C. hircinum*, with f. *deminutum*, var. *andinum*, var. *rhombicum*, sub-sp. *catamarcense*, sub-sp. *Milleanum*. 26. *C. philippianum* Aell. 27. *C. Quinoa*. 28. *C. pallescens*. 29. *C. sandwicheum*. 30. *C. carnulosum*. 31. *C. pallidicaule* Aell. 32. *C. album*, with many varieties, including *lanceolatum* Muhl. 33. *C. Zobelii* Ludwig. 34. *C. opulifolium*. 35. *C. leptophyllum* Nutt., with var. *Leptophylloides*. 36. *C. hians*. 37. *C. inamoenum*. 38. *C. Vulvaria*. 39. *C. atrovirens*. 40. *C. subglabrum*. 41. *C. Fremontii*. 42. *C. incanium* Heller. 43. *C. gigantospermum*. 44. *C. papulosum* Moq. 45. *C. petiolare* (*paniculatum* Murr). 46. *C. hastatum*. 47. *C. pileomayense*. 48. *C. cordobense*. 49. *C. lenticulare*. 50. *C. Hyloides*. 51. *C. Covillei*. 52. *C. Standleyanum*. 53. *C. glaucophyllum*. 54. *C. missouriense*. 55. *C. murale*. 56. *C. urbicum*, and several hybrids.

These two papers form an extremely valuable contribution to the studies of the members of this critical genus.

Fedde Rep., 215, 1929. *Chenopodium rugosum* Aell., from Siberia.

Chenopodium strictum Roth, in *Nov. Pl.*, 180, 1821. Ein alterer Name für *C. striatum* (Kras.) Murr, 1896, with the reduction of f. *erosum* (Murr), f. *glaucescens* (Murr), and *rotundatum* (Sav. et Rayss.).

ANNALS OF BOTANY. January, April, July, October. Editors: V. H. Blackman, Sc.D., F.R.S., and R. Thaxter, M.A., Ph.D. £3 per annum. Chromosome Numbers and Relationship of North American species of *Viola*, with sixty figures, J. Clausen.

BECHERER, A. Systematik und Floristik der Gefasspflanzen, in Berichte der Schweiz. Bot. Gesell., heft 38, 1929. Includes numerous points of nomenclatorial interest. Nomina Honckengyna Neglecta Candollea, iv., 59, 1929. Pteridologische Beiträge, *l.c.*, 24, 1929. Der Botanisches Name der Stachelbeere (Gooseberry), in Rep. Spec. Nov., vol. 27, December 1929.

BELGIQUE, BULLETIN DE LA SOCIETE ROYALE DE BOTANIQUE. Tome xi., fasc. 1, 1928. La Dispersion des *Rubus* en Belgique, by A. Charlet, L. Magnel and A. Marechal. The species are arranged according to the work of Sudre, 76 being enumerated, as well as numerous hybrids. There is also a note on the Role des *Rubus* dans l'Evolution Générale, by J. Houzean de Lehaie. R. Naveau records f. *Isoetoides* of *Littorella* in Campuil. Maurice Hocquette (p. 37) has a contribution towards a Monograph of *Agrostis alpina*. Tome xi., fasc. 2, 1929. J. Houzean de Lehaie contributes Considérations sur la Systématique Génétique des Orchidées Belges, p. 108. Of *O. Morio* he gives the characters of 64 forms. A. Monoyer writes on the Comparative Morphology of *Scirpus sylvaticus* and *S. lacustris*.

BEMROSE, G. J. V. Contributions to the Flora of Rutland. Reprint from Trans. Leicester Literary and Philosophical Society, 1928. It may be recalled that Candler's List in the Victoria County History enumerated 665 species. Among the specially interesting plants are *Linum anglicum*, *Trifolium ochroleucon*, *Anemone Pulsatilla* and *Astragalus danicus*. Closer attention should be given to the nomenclature of the plants. *O. major* L. and *O. elatior* are the same thing. We look forward with interest to a more complete work.

BEWS, J. W., M.A., D.Sc. THE WORLD'S GRASSES. Their Differentiation, Distribution, Economics, and Ecology. Pp. 408. Longmans, Green & Co., London, 1929; 21/- We must congratulate Dr Bews upon the production of another useful volume. In this work there is a general account of the differentiation of all the known genera of grasses and their distribution, together with notes on all the more important economic species. The author also deals with the ecology of the world's grassland. The introductory part treats of the inflorescence and its parts, seed-dispersal, germination and cytology. The second chapter gives a clever general differentiation of the tribes and genera. The third supplies a key to the tribes and genera. 483 of the latter are described in the clavis. It must be noted, however, that this number is raised by many genera having two references, *i.e.*, *Koeleria*. Dalla Torre and Harms in the *Genera Siphonogammarum* give 304 genera. Durand in the *Generum Phanerogamarum* has 313, and Uphof in *Die*

Pflanzengattung, 316. It is needless to say that the arrangement in all four works is different. It must be remembered that, since the last three works were written, Dr Stapf's activities have added a large number of genera which previously were in a subordinate position, and also some that are actually new. The key in Dr Bews' work occupies 44 pages. We notice that *Vulpia* is kept distinct from *Festuca*, *Leersia* from *Oryza* and *Phragmites* from *Arundo*. *Bromus* includes *Serrafalcus*. *Glyceria* is separated from *Puccinellia*. We are glad to see *Atropis* relegated to the shades. *Digitaria* and *Echinochloa* are separated from *Panicum*, but *Deyeuxia* is merged into *Calamagrostis*. *Spartina maritima* is used instead of *S. stricta*. Our *Festuca rigida* is called *Scleropoa*. It is a distinct little grass which deserved a generic grade of its own. In the Distribution of the Genera the approximate number of species is given under each genus, and also their geographical distribution. 73 species are assigned to *Bambusa*, 200 to *Poa*. The agricultural uses are also given. Under *Triticum*, Percival's views on the wheat are aptly condensed. *Agrostis palustris* is used instead of *A. alba*, and *A. tenuis* instead of *A. capillaris*. Under *Ammophila*, *A. baltica* is "a variety, or closely allied species," its possible hybrid origin being ignored. *Gastridium australe* is used instead of the older *G. ventricosum*. And so, too, *Phalaris Boehmeri* is taken instead of the earlier *P. Phalaroides*. Our alien, *Panicum colonum*, is put, with *Crus-galli*, into the genus *Echinochloa*. There is a key to the varieties of *Setaria italica*. In his statistical summary, Dr Bews gives 483 genera with 5871 species. A large portion of the book is used to discuss general ecology, and this is done in an able manner. Some botanists would say that *Festuca pratensis, elatior* and *arundinacea* are one species, yet it is stated that the two former are less rust and drought resistant than *arundinacea*, which is grown for these reasons in S. Africa and called the New Zealand Tall Fescue. The appendix must not be lost sight of since much new information is given, especially on the new genera of the Bambuseae. There is an extensive Bibliography. To the student of grasses, this work will be found to be most useful.

Bose, Sir Jagadis Chunder, M.A., D.Sc., F.R.S., etc. The Motor Mechanism of Plants. 8vo., pp. xxv., 429, tt. 242. Longmans, Green & Co., London, New York, Toronto, 1928; 21/-. "In this volume, the author has brought together the results of his researches on the movements of plants, which have been published from time to time in previous works. They relate not only to the visible external movements, but also to the invisible internal movements concerned with the propulsion of sap." Sir Jagadis first announced his discoveries in the motor mechanism of plants in an Evening Meeting of the Royal Institution, 29 years ago, when he said every plant and each organ of every plant responds to stimulation, the excitation being manifested by an electric response of galvanometric negativity. This was elaborated in 1902 in his work, "Response in the Living and non Living." Continuing his work he demonstrated that not only "sensitive" plants but ordinary plants as

well respond to stimulation by a mechanical movement, the response being recorded by automatic instruments invented by Sir Jagadis (see his volume on " Plant Response," 1906). In his " Comparative Electro-Physiology," 1907, further advances were made. So striking were the results that a spirit of opposition was roused which is represented in a review of his " Comparative Electro-Physiology " which appeared in *Nature*, March 8, 1908, where it says that " the whole book abounds in interesting matter skilfully woven together, and would be recommended as of great value, *if it did not continually arouse our incredulity* " [the italics are mine]. It was my privilege to see, in the early stages, his meticulous care in experimenting and the extraordinary high magnification of the movements which resulted from his stimulation of the plant as recorded by the most ingenious instruments he had devised. I was not among the doubters. One saw the effects of the injection of strychnia, and the effects of the electric stimuli, and so great was the magnification that we saw wheat actually grow. But the incredulity, after all, was perhaps not unnatural since botanical physiology had lagged behind that of the animal kingdom, since it lacked the very delicate instruments which were designed by Sir Jagadis. A controversy in " The Times " in 1920 led to the matter being submitted to an enquiry by a committee of the Royal Society, which included Sir William Bragg, and they reported that they were satisfied that the growth of the plant and its response to stimulation were correctly recorded by his instruments, at a magnification of one to ten million times. In the present volume, which is packed with the results of countless experiments, and which is copiously illustrated, the publishers have prepared a splendid volume in which its learned author has taken the opportunity of giving a more detailed account of the rhythmic peristaltic activity by which the sap is propelled in the plant. This has been correlated with animals, the result being to establish a general law in regard to the propagation of the peristaltic and antiperistaltic waves in both animals and plants, thus affording another proof of the unity of organic life. Actually there seems little or no difference in the reaction to stimulants afforded by animal or vegetable tissue. Years ago I saw Sir J. Burdon Sanderson show the electric force set forth in the movement of a tentacle of *Drosera*. We congratulate Sir Jagadis Bose on the production of such a volume as the one under consideration. Even more do we congratulate him on his quiet persevering progress and on his persistence against what at one time was a solid opposition which might have daunted one less equipped with the necessary knowledge to overcome and even to convince his opponents. That the results of his research will powerfully influence future work is quite certain.

It may well be recalled that on December 21, 1928, Sir J. C. Bose celebrated his 70th birthday, when there was an international celebration to which the Maharajah of Nepal and the Governors and Chancellors of different Universities sent their delegates. A special poem was composed for the occasion by Rabindranath Tagore. Very many congratulations were sent from various parts of the world, including

Nanking and the Sorbonne, Paris. The Senate of the University of Calcutta also posted a congratulatory telegram.

BRITISH ASSOCIATION. Burlington House, Piccadilly, London. Annual subscription, £1. The ninety-seventh meeting was held in South Africa. The Presidential address on The International Relationship of Minerals was given by Sir Thomas Holland at Johannesburg. Section K. was presided over by Prof. A. C. Seward, whose Botanical address was on Paleontology—The Botanical Records of the Rocks: with special reference to the early *Glossopteris* Flora. Jan H. Hofmeyr, President of the South African Association, delivered an inaugural address in Cape Town in July to the members of the British Association. Prof. R. S. Adamson gave a paper on the Vegetation of the Cape Peninsula, and there were discussions on July 26 on the origin and evolution of the South African Flora. Prof. Moss's paper had special reference to the Witswatersrand District. Dr E. P. Philips gave a brief sketch of the Economics of Pretoria. Dr S. Schönland's subject was South African Plant Hybrids.

BUSGEN, Dr M. THE STRUCTURE AND LIFE OF FOREST TREES. Third, revised and enlarged edition by Dr E. Münch. English translation by T. Thomson, M.Sc., University Lecturer in Forestry, University College of North Wales, Bangor. Pp. 436, tt. 172, text fig. 167. Chapman & Hall, London; 30/-. In the Preface, Dr Münch says that Dr Busgen died on July 21, 1921, and he was entrusted to prepare a third edition. How useful the work has proved is shown by its needing a third edition. Dr Münch has wisely not been content with mere verbal alterations, but has drastically reconstructed many sections or added new ones. The list of Authors has been newly compiled, and the Index has been carefully enlarged. The number of illustrations has been increased by 47. There is no doubt of the excellence of the work, and we are indebted to Mr Thomson for his careful translation. He asserts that, despite the very large output of books on the various branches of Forestry, there is no single book which deals comprehensively with the structure and life of forest-trees, and contains at the same time the results of past researches in the field, and references to the original papers.

There are fourteen Chapters, the first treating of The Form of the Tree, in which a mass of information is brought together. Under Tree Heights, Kanneglesser is cited as the authority for these maximum measurements. The tallest is *Eucalyptus amygdalina*, 155 metres, but this has been questioned, and is not admitted by many writers. I may add that I have a small piece of the bark from a tree said to be 470 feet high. The tree was burned down afterwards by the owner of the land on account of the nuisance caused by the crowd of visitors " who came to see the tree higher than the cross of St Paul's Cathedral." The next highest tree is the Californian *Sequoia*, 102 metres. *Ceiba pentandra*, from the Cameroons, is said to be 60 metres. The greatest tree ages cited are *Taxus baccata*, 3000 years; *Juniper canescens*, 2000

years; *Quercus Robur*, 1500 years; the Sweet Chestnut, 700 years (probably understated); and the Sycamore, 600 years. The girth-figures include Sweet Chestnut, 15.20 metres; Oak, 15.20; Lime, 17; Yew, 15; but this does not include the girth assigned to the great Chestnut of Etna which is said to have been over 60 metres round. The Buds, with their structure and growth, are dealt with in chapter ii. The Wood, its formation, structure, annual rings, and technical properties, occupy chapters iv., v., vi., and vii., all excellently illustrated; the Leaves, chapter viii.; the Root, chapter ix.; Water consumption of trees, chapter x.; Mineral nutrients, chapter xi., an extremely valuable contribution. The Chapter on Flowers, Fruits, and Seedlings is peculiarly attractive. Under the Life and Structure of Forest Trees, their range of variation is alluded to. Every spruce has a different look, and if each of the more prominent forms—comb type, plate type, ribbon type, bush type—were cultivated apart, they would seem to be real varieties. That is the case with our Elms and other trees. They may have a fastigiate form, a pyramidal form, or an oak-topped form, and some of these varied forms may be true races. So too with the oak, the acorns vary immensely. To the Forester and Botanist alike, this book will prove extremely useful, and even the more general reader will find therein stimulating facts which may solve a problem. The very full citation of Authorities is not the least acceptable portion of an erudite publication.

California University, Publications of, 1929. Plantae Elmerianae Borneense, E. D. Merrill, xiv., 1-315. Prof. U. Martelli of Florence named the Pandanaceae, five being new species. There are two new Oaks, two *Ficus*, two *Loranthus*, three *Uvaria*, seven *Beilschmiedia*, three *Bauhinia*, eleven *Aglaia*, eleven *Baccaurea*, seven *Eugenia*, and eight *Diospyros* amid a multitude of others. We heartily congratulate Mr Merrill, my fellow passenger through the Spicy Isles, on the completion of this very arduous task, and the University on their generosity in publishing it. Pteridophyta Novae Calcedoniae and New Pteridophytes of Sumatra, E. B. Copeland, xiv., 353, 369, 371-378, tt. 55-61. Twelve new ferns are described, seven of which are figured. The Genus *Microdictyon*, W. A. Setchell, xiv., n. 20, pp. 453-588. tt. 105 in text. Morphological and Phenological Notes on *Zostera marina*, W. A. Setchell, *l.c.*, 389-452. New Species of *Crepis* from Central Asia, E. B. Bablock, *l.c.*, 323-333, include *C. atripappa*, *C. cineripappa*, *C. elongata*, *C. Fusca*, *C. kashmirica*, *C. simulatrix*, *C. tibetica*, *C. Wilsoni*, *C. Pratti*, and *C. yunnanensis*.

Calvert, Albert F. Daffodil Growing for Pleasure and Profit. Pp. 412, 236 full page illustrations. Dulau & Co., 1929; 21/-. The frontispiece is the "Whiteley Gem," for which Mr Calvert was awarded the Gold Medal at the London Daffodil Show, 1928. The dedication is to the well-known horticulturist, the Rev. G. H. Engleheart, who supplies a page of introduction. There are 36 chapters, the first giving

the history of the Daffodil, the second being devoted to its classification. Turner, 1548, mentioned " A Few Narcissus of Dieverse Sortes," 24 in number, while Parkinson in his *Paradisus* of 1629 names nearly a hundred species, and their varieties. The classification is on Horticultural rather than on Botanical lines, and the succeeding chapters, written from the same point of view, will be very useful to the Daffodil grower. In Cornwall, between 800 and 1000 acres are under bulb culture. Guernsey, too, is much interested in them, and in 1927 sent out five millions of packages. There seems also to be a growing interest in their cultivation in Jersey. Mr P. D. Williams contributes a chapter on the Progress of the Daffodil from 1890-1910. At the show at Chiswick, in 1890, over three hundred sorts were exhibited, one of the most successful ones being a cross, *ornatus* × *poetarum* by Mr Engleheart, which was called " Horace," and which was awarded the Silver-Gilt Medal in 1894. Mr Brodie of Brodie supplies a chapter on Raising Daffodils from Seed, mention being made of the results obtained by such cultivation by Mr Engleheart, Mr P. D. Williams, Mr Dorrien-Smith, and Mr P. M. Barr. Much useful information is given on the treatment of diseases. An especially suggestive and useful paper is that on hybrids by Mr Engleheart which we are glad is repeated here for the facts remain unchanged. These hybrids are in many cases fertile. Some time ago it was announced that *odorus* was a native in Cornwall but an examination, *in situ*, showed that it had been cultivated there. It is a hybrid of *Pseudo-Narcissus* with *Jonquilla*. *N. biflorus*, which is wild near Montpellier and is thoroughly established in several British localities, is said to be a hybrid of *N. poeticus* and *N. Tazetta*, while the variable *N. incomparabilis* is a hybrid of *N. poeticus* × *N. Pseudo-Narcissus*. Barr, as we know, made many expeditions to Spain and Portugal, and he was highly successful in discovering new and interesting forms. The plates are of a very high order of excellence, and the Daffodilophist must have this book on a prominent spot of his reference shelf.

CLARK-KENNEDY, A. E., M.D. STEPHEN HALES, D.D., F.R.S. An Eighteenth Century Biography. Pp. 256, tt. 14. Cambridge University Press, 1929, 15/-. Dr Clark-Kennedy has done an essential service in producing this excellent work. It may be remembered that he gave an address on Corpus Christi day, when the Master and Fellows of Corpus Christi at Cambridge celebrated the two hundred and fiftieth anniversary of the birth of Stephen Hales. During the preparation of the address, he found that in order to do justice to this remarkable man it would be necessary to write a book. Francis Darwin contributed the memoir of Hales in the *Dictionary of National Biography*. In *Makers of British Botany* (with a portrait) and in Sachs' *History of Botany* there are also given accounts of this great experimenter, giving him just praise, for it was to him that the great advance from the vegetable physiology as elaborated by Aristotle was due It is beyond our scope to dwell upon his physiological work on animals, but

Dr Clark-Kennedy has done full justice to his most important book, that on Vegetable Statics, a small 8vo. of 376 pages, dated 1727. The Imprimatur, Isaac Newton, Pr. Reg. Soc., is dated February 16, 1726/7. As Newton died on March 20, this must have been one of the last books he signed. The book is dedicated to George, Prince of Wales, afterwards George III., and is couched in the style of his day. "And as Solomon the greatest and wisest of men deigned not to enquire into the nature of Plants, from the Cedar of Lebanon to the Hyssop that springeth out of the wall, so that it will not be an unacceptable entertainment to your Royal Highness"—a pious wish hardly carried into effect as one remembers the difficulty His Majesty in years after felt to realise how the apple got into the dumpling. But closer to the truth than the dedication is the clear and decisive way in which he asserts that plants obtain nourishment not only from the earth but also more sublimed and exalted food from the air—that wonderful fluid which is of such importance to the life of vegetables and animals. It is in this book that his researches on transpiration are recorded. When, 140 years after, Sachs was at work on the subject, he had to go back to Hales to find any results which compared with his own. Diagrams showing Hales' methods of studying the growth of plants, the pressure of blood and the rate of its flow, and on transpiration, etc., are given. In this biography not only are his scientific works described, but there is a full account of his life as a parish priest, as a trustee of the Colony of Georgia, and of his work on Ship and Prison Ventilation. The whole book is a careful tribute to a great scientific pioneer. There is also a laborious account of his forbears. It may be recalled that there is a fine portrait of Hales in Thornton's *Philosophy of Botany*, from a painting by Coates, R.A., engraved by Hopwood. Beneath the portrait is the foreground of a classic scene—an illustration of his experiments on transpiration and sap-pressure. This seems to have escaped the notice of the biographer.

CLEMENTS, FRED E. and EDITH S. CLEMENTS. ROCKY MOUNTAIN FLOWERS: an Illustrated Guide for Plant Lovers and Plant-Users. Pp. 390, 26 colour plates, and 21 black and white. Third edition. H. Wilson & Co., New York, 1928; 3.50 dollars. In this portable and attractive looking volume, the able authors have, in this, the third edition, brought together an immense amount of matter relating to a fascinating region. Not only does it give the plants of the Rocky Mountain regions, including Colorado, Wyoming, most of Montana, Northern New Mexico, Eastern Utah, Western North and South Dakota, Nebraska and Kansas but it includes all the flowers of Glacier, Yellowstone, Rocky Mountain, and Mount Verde National Parks, and the majority of those of the Grand Canyon. The colour plates include 175 species, and the line plates show 355 species. The arrangement differs from that used by Bentham and Hooker and by the Engler botanists, since it begins with the Buttercups, followed by Cruciferae, Malvaceae, Urticaceae, Euphorbiaceae, Geraniaceae, Caryophyllaceae, Polygonaceae, Chenopodiaceae,

Salicaceae, Ericaceae, Boraginaceae, Scrophulariaceae, Labiatae, Rosaceae, Crassulaceae, Onagraceae, Umbelliferae, Compositae, Liliaceae, Orchidaceae, Cyperaceae, Graminaceae, and Coniferae. The Flower Chart is ingenious and shows the development of the other families from the ancestral buttercups. In this work the chart is chiefly valuable in showing the lines of evolution and relationship, and consequently in giving a clue to the arrangement of families and orders in the text. Its greatest value lies in making it possible to trace the effect of insects and wind upon the evolution of the flower, step by step. It also serves as a ready and graphic key to orders and families, and thus makes it possible to obtain such a mastery of family types as to render family keys unnecessary. An excellent clavis to the families is given, and the way to use it is clearly explained. The description of species being clear and definite, the illustrations well-chosen, well-drawn and well-coloured, make it a pleasing work. It is one which every botanist visiting that delightful region must have with him and, later on, whenever its pages are opened, scenes of beauty and of interest, and a varied and pleasing flora will bring back to his memory the places where they were seen growing in their natural surroundings. One wishes that such a work was available for the British Flora. Just as the arrangement of the families differs from that of ours, so too the divergences of nomenclature are many. The Coral-root appears as *C. innata* and not the earlier *trifida*. *Erythraea* is wrongly retained instead of *Centaurium*. *Comarum* is kept as a distinct genus. *Berula* is used, but surely unnecessarily, for *Sium erectum*. *Specularia* is chosen for the older name *Legousia*. We are glad to see the earlier name for the wood rush, *Juncoides* Adanson, is used, but our *Elodea* is given as *Philotria*. *Goodyera* appears as *Peramium*, but is not that an untenable name? The Frog Orchis is *bracteatum* under *Coeloglossum*. It is very close to, and perhaps inseparable from, *viridis*, but I think we are correct in putting our bracteate form under *Vaillantii* Tenore. One would have liked to have seen the name of the botanical author at the end of the species. This delightful volume cannot be left under the shadow of a shade, and it can assuredly be said that it is a most satisfactory work.

CLEMENTS, EDITH S. FLOWERS OF COAST AND SIERRA. Pp. 226, tt. 32, coloured, painted from life. H. Wilson & Co., New York, 1928. Here is another charming and distinctly useful volume treating of the flowers of the Pacific coast from Southern California to British Columbia. The plants are delightfully drawn from living specimens and the colours are well reproduced. In the introduction, Dr Clements gives a popular sketch of the evolution of plants with no uncertain voice, but it is perhaps as seasonable as some others and certainly it is more pleasantly told. Under each species many useful details are given, as that under *Ranunculus californicus*, which ornaments the low grassy hills on the Californian coast as our English Buttercups adorn our meadows, we are told that the many-petalled fragile blossoms reflect the sunshine from polished surfaces—a subject which is much interesting Dr Parkin at

the present time. The seeds of this species, after being parched, are ground into flour by the Indians, and eaten without further cooking. The scarlet Larkspur is a great adornment of the dry chaparral with its six feet high stems and long spikes of brilliant scarlet-vermilion flowers. Our *Hypericum perforatum*, one of the plants figured, is frequent, but it is disliked by farmers as they find it poisonous to stock. It is also a very difficult weed to eradicate. An extraordinary saprophyte is *Sarcodes sanguinea* whose vivid red shafts shoot up magically through the pine-needles in the early spring. But their beauty has led to their being recklessly gathered and they are now under special protection. The *Pyrola rotundifolia* of the heathy mountain side is not white as with us, but has coral-coloured blossoms. Due praise is given to the Shooting-Star, *Dodecatheon Meadia*. I shall never forget my first sight of it in the meadows by the Bow River. It has a wide range—from the Atlantic to the Pacific, from Michigan to Texas, from Lower California to the Behring Straits, but other species may be included under the specific name. Several of our corn adventives are figured, including *Amsinckia intermedia*, *Phacelia*, *Orthocarpus*, etc. The name, *Mimulus luteus*, is used for the Yellow Monkey-flower. This, too, varies with chocolate-coloured blotches. The scarlet *Mimulus* is very showy. Another magnificent species is the purplish crimson-flowered *Lathyrus splendens*, which grows up to eight feet high, and there is rarely the scarlet *Astragalus coccinea* which occurs on the mountains of Southern California and has its beauty intensified by its silvery-grey foliage. *Mentzelia aurea* is a striking species, but the Californian Blazing Star, *M. laevicaulis*, has golden glossy petals, three to five inches in diameter, and is a great favourite of insect visitors. *Lobelia cardinalis*, a favourite garden flower, loves swamp and ditch banks south to Florida and west to the borders of Texas. One has not time to cite from the Compositae, a family so well represented in America. The Old Country has contributed some adventives to the list, *e.g.*, the Chicory. Dr Clements tells how if the plant is cut and put in water, it will continue to open its flower-buds for several days. It brought to my mind her telling me of this when we were in Norfolk on the International Ecological Meeting. The Lilies are well illustrated and described, but my special favourites are the glorious yellow Erythroniums. The book ends with a description of the curious-flowered *Calypso borealis*, which I first saw in Kicking Horse Pass, but it extends into Scandinavia. It is a delightful species, worth the journey to find. We are very grateful to Dr Clements for producing such a pleasing volume.

COCKAYNE, Dr L., F.R.S., F.N.Z.Inst. THE VEGETATION OF NEW ZEALAND. 2nd Edition, pp. 456, tt. 106, and 3 maps. Wilhelm Engelmann, Leipzig, 1928. This forms vol. xiv. of *Die Vegetation der Erde* of Engler and Drude. The first edition, which had been in preparation for ten years, was completed in March 1914, but it was not issued till January 1921. This edition sold out in a year—a testimony to its value. Dr Cockayne was then asked by Prof. Engler and Herr W. Engelmann

to prepare a second edition. He rewrote it, making it practically a new work. The area involved in this work is a most remarkable one. Although not large, it has most variable conditions. The rainfall is in some places 6000 mm. while in others it is less than 350 mm. There are, too, extremely sharp limitations of species. On one side of a mountain there may be an extremely floriferous flora, but, on crossing the crest, the opposite slope may have an entirely different vegetation, with much less colour. The author in his valuable preliminary remarks, defines his views:—1, That the term "species" can quite well be defined. 2, That the units on which it is based are virtually invariable. 3, That the contents of these is not a matter of opinion but of fact. In conjunction with Allan, in a paper on Evolution, 1916, he said that Lotsy took as the fundamental field unit, the Jordanon, which may be defined as a "group of externally alike individuals which breed true when bred among themselves." A Jordanon that is not closely related to any other Jordanon is easily recognisable in the field as "an invariable species," and such we term a simple species. More often groups of closely related Jordanons are met with, and that group we term "compound species," as the more familiar terms, "aggregate species and collective species," have now a wider and vaguer connotation. Jordanons that are sufficiently distinct to allow of effective diagnosis, we call varieties. It should be emphasised that, as so defined, the variety is of as much importance as the species. Compound species, to which in the past taxonomy has attached "intermediates," we term Linneons. It is used to include not only groups of allied Jordanons, but of the hybrids between them as well. In its widest sense it includes two or more closely related species, their Jordanons, and hybrids of all categories. This is what in practice the so called Linnean species have become, coupled not seldom with, what we later define as, Epharmones. The second chapter is devoted to the History of Botanical Investigation from the voyage of Captain Cook to the present day. A most valuable Bibliography is included. The account of the physical features of the outlying islands is very readable. The heading, Physiognomic Plants and their Life Form, shows the intimate knowledge of them the author has. It is in these and the following chapters that such an enormous amount of matter is compressed, as to place the work in the front rank of Ecological Studies. The number of species admitted is 1843, of which 166 are Filices, 20 Gymnosperms, and 1657 Angiosperms. Monocotyledons, numbering 428, and Dicotyledons, numbering 1229, belong to 109 families and 338 genera. Compositae head the list with 256 genera, followed by Filices 147, Cyperaceae 133, Gramineae 131, Umbelliferae 89, and Orchidaceae 71. Two facts come out in bold relief—(1) the number of hybrids; (2) the large percentage of endemics. The study of the hybrids has raised their number from five in 1912, to where 290 groups have been noted, belonging to 42 families and 92 genera. Hybrids of three species are known, and intergeneric hybrids occur. Of the 290 groups, there is no doubt as to the hybrid nature of 230 of them. No fewer than 42 masquerade as true species in the *Manual of the New*

Zealand Flora. It may be recalled that Sir Joseph Hooker said that he saw hybrids of *Sonchus asper* and *oleraceus* in New Zealand. I have only seen two in Britain. I thought perhaps that being outside the range of their natural distribution the ordinary repugnance at crossing had broken down, just as we find the Chenopods do on Tweedside. There they have adapted themselves to their environment so that the natural barriers are ignored. This breaks down what has been called the extreme variability of the New Zealand Flora, yet " in the ordinary taxonomic sense, if the Epharmones be excluded there is no variability whatever, but merely a polymorphy due to the grouping together as a species of two or more Jordanons, and the hybrids between them." The endemic element is remarkable. We spoke of the high percentage of endemics in the Canary Isles but it is even more remarkable in New Zealand, since they constitute 78.6% of the Vascular Flora. Taking the groups separately, 36% of the Pteridophytes, 67% of the Monocotyledons, 88% of the Dicotyledons and 20% of the Gymnosperms are endemic. There are 40 endemic genera. This is most remarkable and argues that the Flora is very ancient. It seems right to assume that tertiary New Zealand possessed a flora part of which had originated on her own soil. This was assumed by Engler and it formed a portion of his palaeoceanic element, which Cockayne named palaeozelanic. There are 38 genera common to Australia and New Zealand, but it is remarkable that such widely spread plants in Australia as Eucalyptus, Callistemon, Melaleuca, Proteaceae (only 2 in N.Z.), Dilleniaceae, Tremandeaceae, Acacia, Pultenaceae, Rutaceae, Casuarinaceae are absent. Therefore his general conclusions are that the Flora of New Zealand, notwithstanding the strong endemism, possesses two very distinct elements, not floristic only, but ecological. They have this one property in common—the power for the most part to endure a fair amount of cold. In other words the element is a temperate one. The second element, also largely endemic, consists of descendants of an ancient palaeotrophic stock, so ancient, indeed, that endemic genera have been developed as well as many distinct endemic species. It has been a singular pleasure to read this important work, and we can strongly recommend it to our members. Oddly enough, as one was reviewing it, a beautiful photograph of a fern-gully came from its distinguished author, upon whose recent receipt of the Darwin Medal of the Royal Society we have pleasure in heartily congratulating him.

COLEMAN, Mrs EDITH. Pollination of an Australian Orchid, *Cryptostylis leptochila*, by an ichneumon-wasp, in Journ. Bot., 97, 1929, with a note by Col. M. J. Godfery.

DARNELL, A. W. ORCHIDS FOR THE OUTDOOR GARDEN: for the use of Amateur Gardeners. A descriptive list of the world's Orchids that may be grown out of doors in the British Isles. Pp. 406, tt. xxii. L. Reeve & Co., Ashford, Kent, 1930; 42/-. At the first sight of this handsome volume, so well produced and illustrated, one is staggered at its dimen-

sions, and it seems difficult to believe that all the numerous Orchids can be grown out-doors in an English garden since no fewer than 977 species are enumerated. The author has done a great service to horticulturists by its production, as these handsome plants are usually very poorly represented in our gardens. As Mr Darnell says in his preface—" The possession of a well appointed rock-garden, however small, with its moraine, ' dripping well,' boggy nooks, pools and variety of soils and aspects, enables the flower lover to bring together in a comparatively limited space, and grow to perfection, a vast number of both beautiful and interesting plants which hitherto could only be grown in districts where local conditions suited their exacting requirements. Considering the fact that a large number of the species enumerated are frequently found growing in company with many of the most cherished denizens of our rock and water gardens, in their native habitats, there seems little reason for their rarity in cultivation. Possibly they are somewhat more exacting in their cultural requirements than many other plants, but when once their likes and dislikes are understood they can be made to flourish for years with ordinary attention." The Genera are arranged in alphabetical order, and under the genus there are numerous synonyms. For instance, with *Bletilla striata*—the *Bletia hyacintha* of R. Br. and the *Limodora striatum* of Thunb. are given. This handsome species ornamented some of the thickets near the Fusa river in Japan. He says it is quite hardy in Great Britain in a sheltered half-shady spot in the rock garden in well-drained loam and leaf-soil. Unfortunately he has chosen the more recent trivial, *pallens*, instead of *Damasonium*, for our white *Cephalanthera*. The statement that the blossoms of *C. rubra* remain half open throughout their existence is not quite correct. I have photographed them fully open, and then they present as different an appearance as possible from the wretched plant figured in English Botany. We are glad to see *Corrallorhiza* has its duplicated name given. Forty-two species of *Cypripedium* are described, including *Calceolus*. The latter may be grown in the rock garden in calcareous loam and leaf-soil. Even *Disa* is included, 43 species being given. Alas, *Epipactis* (not *Helleborine*) is maintained, and *E. atrorubra* is given instead of *atropurpurea*. *Gymnadenia* is retained, in one place misspelled *Gymnadinia*. Under *Habenaria—intacta* is placed, which seems doubtful. Under *Ophrys*, the Spider Orchid is put as *O. aranifera*, not *O. Sphegodes*. Under *O. maculata* are included about 20 forms, including the true *maculata*, *Fuchsii* and *O'Kellyi*. Under *O. Simia*, the synonym *O. tephrosanthos* is omitted. The Butterfly Orchids are put in *Platanthera*, as is also the Frog Orchid, *Coleoprasum*. Did Zollik call the large Butterfly, *Habenaria virescens*? Was it not *Orchis virescens*? Under *P. viridis*, the Frog Orchid is given, but there is no reference to its variety, *Vaillantii*. *Orchis praetermissa* is inexcusably omitted, since its hybrids are exceedingly handsome plants and are often cultivated. The hybrid with the Madeirian *speciosa* is a splendid plant, which has occurred in the gardens of Mr W. H. St Quintin and the late Sir Archibald Buchan Hepburn. This splendid volume is packed with useful information and

should lead to the cultivation of many of these beautiful plants. Incidentally, let us hope that it may lessen the destruction of our native species. What a treat it would be to see in some of the gardens in the west of England and in Ireland a large number of the exotic terrestrial orchids displaying their quaint shapes and peculiar colouring. With this book for his guide the horticulturist may try the experiment with some chance of success.

DEVONSHIRE, TRANSACTIONS OF THE ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, LITERATURE AND ARTS. Vol. lxi., 89-190, 1929. Editor, Rev. G. T. Harris. Includes many plant records for the county, as also the noticeable disappearances.

DOMIN, K. Trinidad and the West Indies. Brünn, 1929. Vol. i. of the Totius Orbis Flora Photographica, pp. 64. Edited by Hugo Iltis. The photos, 9 × 12 cm., are of plants in their original association. It is brought out in three separate editions—German, French and English. Grisebach gave 83 endemic species for Trinidad, but the island has not been worked exhaustively. It has an area of 1862 square miles. Even now 50% of its surface is said to be forest, of which the Mora Forest covers an area of 70,000 acres.

DOMIN, K. The Hybrids and Garden Forms of the Genus *Pityrogamma* Link, in Rep. Rozpr. ii. Tr. Ceske Akad., vol. 38, n. 14, 1929. This includes the well known Silver and Golden Ferns. Hybrids of *Calomelanos* and *Chrysophylla* first appeared in some nurseries in Louvain. A list of the cultivated species and forms of *Pityrogamma* is given. Eleven excellent plates are supplied. We are glad to see our Jersey fern placed under its correct genus—*Anagramma*.

DRABBLE, E., D.Sc. Derbyshire Pansies, in Derbyshire Archaeological and Nat. Hist. Soc., pt. ii., 138, 1927. Twelve species are noted under the four heads—ARVENSIS, TRICOLOR, LEPIDA and LUTEA.

D'URBAN, W. S. M. Notes on Some Plants occurring in the Exeter District, in Proc. of University College Field Club and Natural History Society. Pp. 17-28, 1912-1928. Includes valuable notes on *Sagittaria heterophylla*, var. *iscana*, and *Potamogeton foliosus*. The latter, he thinks, was not introduced with timber.

EDINBURGH, TRANSACTIONS AND PROCEEDINGS OF THE BOTANICAL SOCIETY OF. Vol. xxx., pt. 2, pp. 61-186, 1929. H. B. Watt, paper on *Linaria Cymbalaria* in Scotland, p. 123. W. Balfour Gourlay communicated a paper on *Vaccinium intermedium* Ruthe on the South Pennine Moors, and on Cannock Chase, p. 131. Miss J. S. McNicoll, Notes on Strand Plants—*Salsola Kali*, p. 147. Alexander Pratt, Strand Plants—*Arenaria Peploides*, p. 157.

EDWARDS, A. ROCK GARDENS: how to Plan and Plant them. Including Wall, Paved, and Water-gardens. Pp. 320, tt. 32, text figures 8. Ward, Lock & Co., London; 7/6. This large volume, with its eight coloured plates, is a remarkably cheap and useful publication. Mr Edwards, who superintends the rock-gardens at Kew, can speak with authority on the best way of making them successfully. In plain and untechnical language, this is done in fourteen chapters. With this for his or her aid, the maker of a rock-garden cannot fail to have successful results. The illustrations are excellent and are such as to help the gardener to attain what he desires. The tables of suitable plants are well chosen with the plants arranged in alphabetical order. The alpine-house, and what to grow in it, with the times of flowering, is practical. Hardy ferns useful for the rock-garden is also handy, but why retain the name *Scolopendrium* instead of the more correct *Phyllitis*? The Oak and Beech Ferns are called *Polypodium*, and *Filix-mas* is put in the obsolete genus *Nephrodium*, and, of course, the name, *Pteris*, is still wrongly employed. The use of capitals in the specific names is erratic. The Polystichums are put under *Aspidium*. The adoption of a standard work for naming, *e.g.*, Christensen's *Index Filicum*, might advantageously be used. The coloured illustrations are effective and well chosen. *Tropaeolum polyphyllum* is cheering, as is *Primula Juliae*. Under *Alchemilla*, *A. alpina* is selected, but it is tricky in cultivation, and *A. argentea* Don is much easier to grow, is showier, and has a longer life. The book can be strongly recommended, and makes a useful and inexpensive present.

FITZPATRICK, H. M., B.Agr.Sc. Coniferae: Keys to the Genera and Species, with Economic Notes. In Scientific Proc. of the Royal Dublin Society. Pp. 189-260, 1929; 8/-. Forty-seven genera are dealt with. The first group with solitary leaves, leaves spirally arranged on the twigs, twigs woody in second year, leaves linear, contains *Abies*, *Keteleeria*, *Pseudotsuga*, *Picea*, *Tsuga* and *Taxodium*. Leaves in clusters of 2, 3, 4 or 5 has *Pinus* only. Leaves in clusters of 15-60 on short spurs, single and scattered on the long shoots which continue growth, include *Larix*, *Pseudolarix* and *Cedrus*. *Taxus*, *Taxodium* and others are excellently dealt with, as is the description of the various species. The Cyprian Cypress is kept as a distinct species, a grade which it well deserves. We can cordially recommend this as a most useful help. One wishes that more synonyms had been given, and one does not like to see a name such as *Larix europea* used. Why not the inevitable *Larix Larix* (L.) Karst.?

GARDENERS' CHRONICLE, 1929. Price 6d weekly, or 30/- per annum, post free. 5 Tavistock Street, Covent Garden, London, W.C.2. Memoir of Sir W. T. Thiselton Dyer, p. 1, and of Lord Lambourne, p. 18. Plant History in Nomenclature, Rev. Hilderic Friend. Mr N. E. Brown continues his papers on *Mesembryanthemum*. A splendid photograph of a Chrysanthemum show at Shanghai is given on p. 41. Kingdon Ward

carries on his account of his Asiatic explorations. Cyclamens are treated by H. Correvon, p. 97. He says a root of *C. europaeum* lived for 60 years. *Cotoneaster Simonsii*, p. 108, is recommended as a hedge-plant. Notes from a New Zealand Plant Hunter, p. 143. *Ranunculus gramineus*, by Dr Parkin, p. 220. He observes that the petals do not have the glazed surface of *R. bulbosus* nor the vast number of stamens of the yellow-flowered species. Chile and the Andes (continued), Clarence Elliott. Botanical Tour in Cyprus, G. C. Druce, p. 356. Dr R. A. Fisher and Dr A. D. Imms have been elected Fellows of the Royal Society. Rothamstead has now three Fellows on its staff. We congratulate our member, Mr G. W. E. Loder, on his election to the Presidency of the Royal Horticultural Society on January 24, 1929. There is a portrait of him on p. 154. A good review of Turrill's Plant Life of the Balkan Peninsula is given on p. 424. Alpine and Shingle Plants of New Zealand, part ii., p. 72. Mont Serrate, at Cintra, now likely to change hands, is well described and illustrated, p. 96. Mitcham Peppermint, p. 265. The black variety is the one usually cultivated.

GENEVE, BULLETIN DE LA SOCIETE BOTANIQUE DE. Ed., R. Chodat. Vol. XX., fasc. 2, 386-488, 1928. Contains, *inter alia*—Senglet, A., La Melanogenêse chez quelques plantes d'un intérêt pharmaceutique, 7 fig. Beauverd, G., Comptes Rendu des Séances, Janv.-Dec. 1928. Includes variations in Valais of *Nigretella nigra*, and its hybrids with *Gymnadenia*. Polymorphism of *Silene acaulis*, with a new species, *S. mantziana* Beauv., from Mt. Cenis at 2100 metres, p. 480, and *S. acaulis*, var. *patula*, p. 384, var. *quadriloba* Beauv., p. 383, and of *Hedysarum obscurum*, p. 482. Vol. xxi., pp. 228, 1929. Prix, 20 frs. New species of *Bunium* (*i.e.*, *pygmaeum*, Savoy), etc., Jacq. M. Otto, Recherches expérimentales sur les Gonidies des Lichens appertenant aux genres *Parmelia* et *Cladonia*.

GODDARD, T. RUSSELL. HISTORY OF THE NATURAL HISTORY SOCIETY OF NORTHUMBERLAND, DURHAM, AND NEWCASTLE-UPON-TYNE, 1829-1929. Pp. 195, tt. 17. With a foreword by the President, Viscount Grey of Fallodon. This excellent résumé of the work of the Society could not have been entrusted to more able hands and Mr Goddard has given some very interesting details of the work and of the workers of the Society since its commencement. One order, one family, forty-nine genera, and 218 species new to science have been published in its Transactions. Mr N. J. Winch, whose herbarium is preserved in the Hancock Museum, published Remarks on the distribution of the indigenous plants of Northumberland and Durham, as connected with the geological structure of those counties, in the Transactions in 1830, and A New Flora of Northumberland and Durham, with sketches of its Climate and Physical Geography, was published by J. Gilbert Baker and G. R. Tate in 1848. In other branches of Natural History, equally good work has been accomplished. The illustrations supplied are very good, notably the likeness of Lord Grey, and there are others of the third Duke of

Northumberland, the first Baron Armstrong, W. Van Mildert—Bishop of Durham, Colonel John Joicey, M.P., the second Baron Armstrong, N. J. Winch, W. Hutton, Sir W. C. Trevelyan, and also of the two Hancocks—keen ornithologists, whose collections are the pride of the Museum which bears their name. Many botanists of note were connected with the Society. In addition to Winch and Baker, they had Sir W. C. Trevelyan who wrote on the Botany of the Faroes, Daniel Oliver, Rev. A. M. Norman, Rev. H. B. Tristram, Rev. F. J. Bigge (who introduced *Erinus* on the Roman Wall), Henry Brady, F.R.S., and H. T. Mennell. It may be well to explain that N. J. Winch bequeathed his private herbarium to the Linnean Society, where it remained for twenty-five years. On June 4, 1863, at a general meeting of that Society, an extraordinary resolution was come to, considering the terms of the bequest, to present the collection to the Natural History Society of Northumberland, Durham, and Newcastle-upon-Tyne, where it is now preserved. It contains some Roses of considerable interest.

GODFERY, Colonel M. J. Recent Observations on the Pollination of *Ophrys* in Journ. Bot., 298, 1928. *Ophrys muscifera, O. arachnites*, etc., at Challes-les-Eaux, Savoie. Review of the Iconographie des Orchidées d'Europe et du Bassin Mediterranéen, by E. G. Camus and A. Camus, *l.c.*, 320, 1929.

GODWIN, H. PLANT BIOLOGY. An outline of the principles underlying plant activity and structure. Pp. 264, fig. 65. Cambridge University Press, 1930; 8/6. This, it is said, "is a book for first-year medical students, and for ecological students of similar status." The author has particularly emphasised the physiological point of view, and the physico-chemical background of plant-life. One has reason to think that the reference of the author that "too often students of botany not only come up to the University, but pass through its botanical courses, with far too little appreciation of the general biological subjects with which they deal" is not unjustified, and there can be no doubt that this book will afford a means whereby such a deficiency may be made good. The author discusses living and non-living matter, and shows that the ordinary definition is not so simple as it seems. As regards Plants and Animals, the simplest criterion for distinguishing one from the other is that the latter does, and the former does not, contain chlorophyll pigment. The student is taken through the various stages and has very clearly explained to him the nature of the living plants, its contents of crystalloids and colloids. The necessity of water to plant life is necessary for maintaining rigidity, and the whole class of herbaceous plants is dependent on the presence of a plentiful water supply. A somewhat heavy but necessary chapter on organic substances and their chemical characters leads on to the metabolism of the higher plants, where the difference between animal and plant "Respiration" is explained, to the latter of which the word breathing should not be applied. The Plant Cell, Photosynthesis, Yeasts and the Bacteria are well explained. The Fungi and Green Algae are next discussed. The *Fucus* and

Fumaria, are then explained. The concluding chapters describe the root, the stem and the leaf. A very wise caution is given in the concluding paragraph. Progress in knowledge "can best come by examining physiological phenomena in physico-chemical terms, and determining what things organs do, and how they do them. The nature and origin and persistence of organs is a matter to be considered closely in studies of heredity and evolution, and not to be guessed at prematurely."

HALL, Sir A. DANIEL, K.C.B., LL.D., Sc.D., F.R.S. THE BOOK OF THE TULIP. Pp. 224, tt. 24. Martin Hopkinson, 1929; 21/-. This is not a Monograph of the genus in the sense of Maw's "Genus Crocus." It is meant especially for those who want to grow the most attractive flowers, and to know something of their origin, cultivation, and propagation. The illustrations are from plants specially grown for the purpose. It seems strange that so conspicuous a genus did not appear in drawings and paintings of the fifteenth century. When it does appear in the records it is already in flower, with many varieties and with the peculiarities that we know to-day. The morphology and reproduction are treated of in Chapter I. In the History he cites Busbequinus, Ambassador of the Emperor Ferdinand to the Sultan, who saw Tulips or, as he wrongly called them, "tulipam." In 1572, Clusius met him in Vienna, and obtained from him a lot of seeds and several bulbs. But there was probably a second importation. Matthiolus (*Historia Plantarum*) had the first figure of a tulip in 1561. Sir David says its origin is undoubtedly Eastern, but when we try to look further back we are completely baffled. Later Tulips became very popular, and one called the "Citadel of Antwerp" was sold for 16,000 francs in 1836. The third and fourth chapters are devoted to Taxonomy and a description of the Tulip species, and chapter v. to Breaking and other sports. The classification of the Garden Tulip will prove very useful, and gives many interesting details. Under the heading of the "English Florist's Tulip" is brought together a mass of information. The Cultivation of the Tulip, given in chapter ix., is especially valuable since Sir Daniel writes with full knowledge of this important question, and he gives practical suggestions which will be much appreciated, as will his directions against plant diseases. The book is sure to have a wide sale, and it adds another to the large number of works on Florists' Flowers. It is one of the best in a very attractive series. Two misprints need correcting. The Bodleian expert mentioned in the preface is Mr Gambier Parry, and the picture of the Virgin and Child turning toward a bunch of flowers which undoubtedly contain Garden Tulips, was formerly in the collection of Sir George Holford, not Halford.

HEGI, GUSTAV. Zur Flora der Maloja. Vierb. Nat. Gesell., Zurich, lxxiii., 233, 1928. We find in this that *Dryopteris Villarsii* replaces *Aspidium rigidum* (as in our List) and *A. hybrida* Mill = *A. pubescens* Lam. There are two good photographs of Maloja, and a mass of useful material.

HOLMAN, RICHARD M., and WILFRED W. ROBBINS. A TEXT-BOOK OF GENERAL BOTANY FOR COLLEGES AND UNIVERSITIES. Second edition. Pp. 621, t. 415. John Wiley & Sons, New York; Chapman & Hall, London, 1928. This handsome and well-printed volume adds another to the immense number of text-books. It is not a book to carry about in the pocket. A large part of real estate must be embodied in its heavy pages, but heavy does not apply to the printed matter, for the student is told in plain and easy language the salient facts relating to the science he is studying. What a change from the repulsive text-book of our own student days! The excellent text-figures add an additional value. The book will be as useful to the British student as it has proved itself to be to the American.

HORTICULTURAL SOCIETY, JOURNAL OF THE ROYAL. lxxxiv. Edited by F. J. Chittenden, January 1929. The Sections of the genus *Primula*. Prof. W. Wright Smith and George Forrest. Thirty-two sections are used, and a good key to them is given, as well as an alternative one. The 58 illustrations are very good. The Natural Habitats of Chinese Primulas, by Dr H. Handel-Mazzetti. Asiatic Primulas for the Garden, Hon. H. D. McLaren. Primulas at Wisley, N. K. Gold. Cultivation of new and uncommon Primulas, J. Adamson. There is a good index to the *Primula* names used at the Conference in January. The opening of the New Hall, which has cost about £170,000, took place on June 26. It was stated that the membership now numbers 250,000. Dr F. A. Hampton writes on the Scent of Flowers; Hon. Vicary Gibbs on the Robinias at Aldenham and Kew; Collingwood Ingram on Notes on Japanese Cherries; N. E. Brown on the genus *Dierama*, with key to the 27 species; Marmaduke Odling on the Purple Toothwort (with photograph), at Grey Towers, the seat of Sir Charles Dorman. It first appeared there about ten years ago, but how it was introduced is not known. September 1929. A biography, with portrait, of the late Lord Lambourne forms the first portion. The portrait was painted by W. G. de Glehn, A.R.A. H. Avray Tipping gave an address on the Gardens of Pleasure in England from Plantagenet to Victorian times. It includes a description of Thornbury. Allusion is made to the gardens at Montacute, Drayton, Hampton, Althorp, Denham, Kip's View of Longleat, Holme Lacey, Chatsworth, Wrest and Bramham. Many of the glorious views were lent by the proprietors of "Country Life." Formal Parks and gardens in France, M. A. Duchesne. Colour in Garden Planting, Miss Gertrude Jekyll. Fountain and Garden Sculpture, M. Gilbert Bayes, illustrated by the Fountains of Perugia, the Bronze Boar at Mercato Vecchio, Florence, and the Fountain in the Merchant Taylor's Company's Garden, Threadneedle Street. A Modern Park, Dr Camillo Schneider. This is the Park of Graf E. Silva, Tarouca, at Pruhonice, near Prag, which extends to 500 acres, and forms a series of valleys, surrounded by woody hills with wide green slopes. Several pools of different sizes are connected by a small rivulet. It is one of our largest modern parks, and of the highest artistic value. It is, therefore, a good

thing that the Czecho-Slovakian Government has taken it over as a National Park, while he, who fashioned it remains at Pruhonice until his death. The Small English Garden, M. G. Dillistone. Plant Hunting in Crete, G. P. Baker. This includes splendid photographs of *Euphorbia acanthothamnos* and *Poterium spinosum*. *Cyclamen pseudo-graecum*, the fragrant *Daphne sericea*, and *Cyclamen creticum* were in full bloom. Other plants noticed were *Ebenus creticus*, the spiny *Verbascum spinosum*, *Iris unguicularis*, *Tulipa saxatilis*, *T. cretica*, *Crocus Olivarii*, *Chionodoxa cretica*, *C. nana*, *Paeonia cretica* and many Orchids. The article is readable and gives a good idea of this most interesting island.

HURST, C. C., Ph.D. The Genetics of the Rose. Reprint from the Rose Annual for 1929. Printed for the National Rose Society by the Croydon Advertiser. Pp. 64, 1929. Major Hurst examined Rose material in three different ways—Taxonomy, Genetics, and Cytology. First, about 100 characters of each species and variety have been examined and tabulated. Second, numerous experimental crosses have been made between various species, sub-species and varieties and the results recorded and tabulated. Many known hybrids have also been analysed. Third, the chromosomes of 674 species, sub-species, varieties and hybrids have been examined and counted in various stages in both body-cells and germ-cells under high power microscopes. The results have proved to be of considerable importance. In many cases surprising and quite unexpected results have been obtained, but Dr Hurst acknowledges that very much work will have to be done to record the results already obtained. So far as he can see, we are merely on the threshold of important results. The paper is illustrated with 11 plates and many figures.

INNES, JOHN, HORTICULTURAL INSTITUTION. Conference on Polyploidy held at the Institution on January 19, 1929, to commemorate the birth of the founder, John Innes, on January 20, 1829. Mr Ernest Innes gave a short biography of the founder, and Mr J. B. S. Haldane gave the Genetics of Polyploid Plants. Dr C. C. Hurst spoke on Polyploidy as a Source of Species and Horticultural Varieties. Dr R. Ruggles Gates treated of the Origin of Polyploidy, Dr C. L. Huskins on Some Aspects of Polyploidy in relation to the Cereal Crops, and Mr M. B. Crane spoke on Polyploidy and Sterility in Cultivated Fruits. This contained some very interesting matter relating to hybrid Rubi. The basic chromosome number is 7. The Raspberry varieties " Superlative " and "Lloyd George" have 14 (the latter is unusually generous), the "Mahdi" 21, the "Veitchberry" 28, and the "Laxton Berry" 49. It is well known that the fertility and fruit production of the odd multiple forms—the triploid "Mahdi" and heptaploid "Laxton Berry" is much lower than that of even multiple and balanced chromosome forms—the diploid Raspberries, the tetraploid Veitchberry and the hexaploid Loganberry. In Prunus the basic chromosome number is eight. The somatic numbers of our commoner species are as follows:—*Prunus cerasifera* 16, *spinosa* 32, *insititia* 48, *domestica* 48, *avium* 16 and *Cerasus* 32. Hybrids of

P. insititia 48 crossed with *spinosa* 32 have the intermediate chromosome number 40. Dr C. D. Darlington's subject was the Significance of Chromosome Behaviour in Polyploids for the Theory of Meiosis, and Dr F. W. Sansome's subject, Polyploidy in the Tomato.

IRISH NATURALIST. Bimonthly. 6/- a year. Editor, J. A. S. Stendall, M.R.I.A., Deve, Haypark Avenue, Belfast. Botany, S. A. Bennett, B.A., B.Sc.; Rev. R. W. Megaw, B.A.; Prof. J. Small, D.Sc. Phenological Report, p. 136. New or Rare Plants of Ireland, G. Claridge Druce, p. 163. Grasswrack Community on Ballyholme Bay, C. T. Ingold, M.Sc. Some Plants of Northern Ireland, Miss I. M. Roper. *Erodium Ballii* was refound at Newcastle, Co. Down. *Equisetum litorale* in Ireland, R. L. Praeger, p. 191. Plants of Cappoquin, Waterford, p. 208. *Cephalanthera ensifolia* in Co. Dublin, A. W. Stelfox, p. 247. *Sisyrinchium angustifolium* in Donegal, R. L. Praeger, p. 248.

JOURNAL OF BOTANY, THE. British and Foreign, 1929. Edited by A. B. Rendle, D.Sc., F.R.S. 2/- monthly, 22/6 yearly. Notes on the Linnean Types of American Labiatae, by Dr Carl Epling, p. 1. *Mesembryanthemum* and Allied Genera, N. E. Brown, p. 17. On some Varieties of *Rosa tomentosa*, Lt.-Col. A. H. Wolley-Dod, p. 38. *Senecio erraticus* Bertol., Dr E. Drabble, p. 42. Key to the British Pansies, by Dr E. Drabble, p. 69, includes a new variety, *patula*, of *V. contempta*, from Bucks, Surrey, Sussex and Herts. Pollination of an Australian Orchid, *Cryptostylis leptochila* F. Muell., by Mrs Edith Coleman, with a note by Col. M. J. Godfery, p. 97. Notes on *Melampyrum*, C. E. Salmon, p. 105. These are on specimens examined by R. Soó. Duriaei Iter Asturicum Botanicum, C. C. Lacaita, pp. 107, 207, 255, 324. Two new Primulae from Spain, A. J. Wilmott, p. 149. Abstracts of Papers of Interest to Students of the British Flora, by E. G. B. and C. E. S., runs throughout the year. A New Variety of *Polygala serpyllifolia*, by C. E. Salmon, p. 193. Three Genistas of the Linnean Herbarium, by C. C. Lacaita, p. 199. Biography of Arthur Bennett, with portrait, p. 217. *Glyceria distans* and *G. retroflexa* in Britain, by C. E. Salmon, p. 243. South Africa Meeting of the British Association, by A. B. Rendle, pp. 247, 265, 289, 321. The Alabastra Diversa pursue their unemotional career to the 36th part, p. 270. Recent Observations on the Pollination of *Ophrys*, by Col. M. J. Godfery, p. 298. *Calluna vulgaris*, a recent adventive on Sable Island, Nova Scotia, H. St. John, p. 306, who shows that the *Calluna* was correctly described as adventive. Mr Bennett's reference was to *Potamogeton polygonifolius*, not *Calluna*, although his sentence was ambiguously worded. *Erica ciliari-tetralix*, Cornwall, by C. C. Lacaita, p. 310. *Carex* Notes, p. 332. Mr C. E. Salmon has submitted many sedges to the Pfarrer Kükenthal, our old valued referee. He passes *C. divulsa* × *remota* from Mayfield, Sussex. He also corroborates my *C. helvola* Blytt from Ben Lawers whence *C. lagopina* has not as yet been found. International Botanical Congress: Proposals on Nomenclature by British Botanists, p. 336. The eliminating of any

botanist not connected with official departments is not a favourable omen. Second Supplement to Watson's Topographical Botany, by Arthur Bennett, C. E. Salmon and J. R. Matthews.

JOURNAL OF ECOLOGY. Edited by A. G. Tansley, F.R.S. 45/- per annum. Biological Equipment of Species in Relation to Competition. Woodhead, T. W., Vegetation of the Southern Pennines.

KEW BULLETIN OF MISCELLANEOUS INFORMATION, 1929. *Gardenia* or *Warneria*, p. 12. Shows that *Gardenia Jasminoides* Ellis is the correct name. But the earlier *Gardenia* Colden has precedence, see Amer. Midl. Nat., viii., 34, 1922. This equals *Triadenum* Rafin., 1808. Obituary of W. T. Thiselton-Dyer, p. 65, with portrait. New species of *Puccinellia acroxantha* Smith & Hubbard, from Orange Free State, p. 87. Dr Sprague, p. 89, shows that Bergius *Descriptiones Plantarum*, September 1767, precedes the publication of Linnaeus *Mantissa Prima*, November 1767. Fastigiate and Pyramidal Trees, W. J. Bean, p. 97. *Ulmus stricta* is said to be a true species. It is the *U. minor* Miller. The Lombardy Poplar is said to have been introduced into Britain by Lord Rochford in 1758. It is always male, yet its pollen has fertilised the female flowers of *nigra* and induced a columnar shape in some measure in its offspring. It was introduced to France in 1749. W. Marsden-Jones and W. B. Turrill continue their researches on *Silene maritima* and *S. vulgaris* (*Cucubalus*). They show, *inter alia*, that many natural hybrids occur. The Imalong Mountain, Sudan, T. F. Chipp, p. 177. The highest summit, Mt. Kinchi, 10,414 feet, was reached. *Lycopodium clavatum* and *Pteridium* occurred from 5000 feet upwards. A list of plants found is appended which include several new species, including *Coreopsis Chippii* from the summit. Violae Asiaticae Novae, Wilhelm Becker, p. 200, one of the author's last publications. New Ferns from Tropical America and the West Indies, K. Domin, p. 215. Notes on the Flora of the Nearer East, W. B. Turrill, p. 223. A Botanical Tour in South Africa, J. Hutchinson, p. 273. He gives a delightful account of his journey of 7000 miles. On one occasion he travelled with General Smuts, and my Oxford friends, the Gilletts. Over 3000 species were collected. Fastigiate and Pyramidal Trees, Vicary Gibbs, p. 285. Some Impressions of Sweden, W. Dallimore, p. 287. A New Genus of Grasses from Bechuanaland, C. E. Hubbard, p. 319.

INDEX KEWENSIS PLANTARUM PHANEROGAMARUM Supplementum Septimum Nomina et Synonyma omnium Generum et Specierum ab initio anni MDCCCXXI usque ad finem anni MDCCCCXXV, nonnulla etiam antea edita complectens ductu et consilio A. W. Hill confecerunt Herbarii Horti Regii Botanici Kewensis Curatores. Oxonii, E. preto Clarendoniano. It seems scarcely possible that it is time for another of these most valuable supplements to appear; yet here, only three years after the publication of Supplement VI., is one which contains even more pages, 260 against 222. This is in part caused by the inclusion of many

of the overlooked published names, *e.g.*, *Corion*, as restored by N. E. Brown in the Supplement to English Botany, 48, 1891. It was not valid because there were other conflicting names, and so did not come into use. Oddly enough, of the four specific names cited, three of them are referred to different genera, where they were first supposed to be described. Strictly they all belong to the conserved genus *Spergularia*, however *Corion medium* and *C. rubrum* are referred to *Arenaria media* and *A. rubra* respectively; *Corion marinum* to *Buda marina*, and *C. rupestre* N. E. Br. to *Lepigonum rupestre*. If one is saturated with the earlier volumes and supplements, it would seem that these are the proper names to use. In the later numbers of the Supplement it has a different meaning, since now such names refer to the earliest name of the species. This volume is essential to every systematic botanist, and it will be of the greatest service to the horticulturist and to all of the many heads of the sciences grouped under the head of botany since its consulter is informed to which family any plant belongs, the place and date of publication of the genus and species, and its geographical home. The extracts have been made with meticulous care, and Miss M. L. Green is to be warmly congratulated upon her assiduous work in extracting them. The Index still has the advantage of having Dr T. A. Sprague as its supervisor, after 22 years of very laborious service. A new feature is " Nomina Genera nova atque neglecta sub familiis disposita," which enables one interested in any group to see what new genera have been published in the last five years. One small correction may be made. Under *Lonas annua*, the author is given as Grande, 1924; it should be Druce in *B.E.C.*, 287, 1918. Italics are not used for any of the genera. All are in the same type which is an easier plan for the printer. The typography is what we should expect from the Clarendon Press, and the appearance of this, the seventh supplement, adds another debt to the memory of Darwin who was the originator of this magnificent contribution to Botanical Literature which has already had as its Editors, Hooker, Dyer, Prain and Hill.

INDEX LONDINENSIS, containing Illustrations of Flowering Plants, Ferns, and Fern-allies. Edited by Dr Otto Stapf. The original work, Iconum Botanicarum Index, was published in 1855 at Berlin, by Dr G. A. Pritzel, W. Pamplin being the London agent. It ran to 1103 double-columned pages. The names and places of publication alone, without reductions or synonyms, were given. Despite this the author had to reject 150,000 determinations as worthless. There are fourteen pages of Bibliography, and about 107,000 references. The present work is being prepared under the auspices of the Royal Horticultural Society, who have wisely entrusted the printing of so important a work to the Clarendon Press at Oxford. In 1928 the card MS. of the first volume, with nearly 84,000 references to illustrations, was in the hands of the printers. When the remaining 5 vols. are published, the total number of entries will amount to nearly half a million. Dalla Torre and Harms' " Genera Siphonogammarum " has been used for cross reference (why

not Bentham and Hooker, to keep closer in touch with the "Index Kewensis?"). The Editor's introduction is in English, and this gives a brief sketch of the life of Pritzel. The first volume consists of 547 4to. pages, from *Aa.* to *Campanopsis*. The work must be of immense value to the botanist and horticulturist. It will be completed in six volumes, at £5 5s each.

LEVYNS, M. R., Lecturer in Botany, University of Cape Town. A GUIDE TO THE FLORA OF THE CAPE PENINSULA. Pp. 285, tt. 199. Jute & Co., Cape Town. This compact work will meet a great demand since the clear key to the Families and Genera will enable the visitor to that rich area to refer a plant to its proper place. Owing to the exigencies of space the species have had to be omitted, but under each genus the number of species included in it is given, and some reference to its members are made, while the vernacular name is often stated. The Families have been numbered and these numbers will be found in the Keys. The Keys, however, are to be recommended for use only in the Peninsula. There is an ample Glossary. Thank heaven, there is only one index, and a good one, and this also gives the number of the figure of the plant. The arrangement is based on Engler "as more in accordance with natural relationship than the older system of Bentham and Hooker." There are some strange examples of nomenclature. *Pteridium* Kuhn. is used instead of the older *Eupteris* Newman; and we find that *Cladium jamaicense*, *Wolffia Michelii* and *Nasturtium officinale* are used. Tournefort is given as the authority for several genera, but he is omitted for many others. As a matter of fact, his name should always be in brackets, because it is pre-Linnean. The authority for *Melilotus*, for instance, is Miller, or [Tourn.] Miller. See also *Linaria*, *Veronica*, *Antirrhinum* and *Marrubium*. *Limnanthemum* is given instead of the earlier *Nymphoides*. *Cryptostemma calendulaceum* Br. should be *C. Calendula* (L.) Druce. It seems strange to a Britisher that there are only four Carices in the Cape Flora, but there are 31 Pelargoniums, 99 Ericas, 24 Gladioli, 48 Disas, one of which is appropriately figured. There is only one Willow. The book is clearly printed, with few misprints, and the descriptions are terse and clear. The book would have been very greatly increased in value had the species also been described, but this may well occupy a future work by the same writer. This Flora is indispensable to the European botanist who visits the Cape Colony. It will save him wading through the heavy tomes treating of this attractive area. It deserves to be popular, and it is to be hoped that similar areas will be treated in the same manner.

LINNEAN SOCIETY. President, Sir Sydney F. Harmer, F.R.S., Burlington House, Piccadilly. Annual Subscription, £4. The Journal contains:—The Botanical Collections made by Capt. F. Kingdon Ward in Eastern Himalaya and Tibet, C. V. B. Marquand, pp. 149-229. Marine Algae of some German Warships in Scapa Flow, and of the Neighbouring Shore, Lilian Lyle, p. 231. The Taxonomy and Geography of

the Sind Himalaya Genus, *Cremanthodum*, R. D'O. Good, p. 259. The Proceedings, November 28-May 29. Dr A. W. Hill, p. 34, alluded to the large group of wild hybrids in New Zealand in his paper on Hybridisation in the New Zealand Flora, specially mentioning the Gaultherias. E. Marsden-Jones and Dr W. B. Turrill read a paper on Hybridisation in certain genera of the British Flora, especially *Silene* and *Centaurea*, and Dr Moss contributed a paper on Some Natural Hybrids of *Clematis*, *Anemone* and *Gerbera* from the Transvaal. Dr Claridge Druce, p. 51, gave an account, illustrated with lantern slides, of his visit to Cyprus, and mentioned some new discoveries. H. W. Pugsley, p. 59, read a paper on British *Euphrasia*. The Presidential Address by Sir Sydney F. Harmer was given on May 24. It was a very able discussion of *Polyzoa*, and occupies 50 pages. The Hooker Lecture, on the "Origin of Adaptations," was given by Dr E. J. Allen, F.R.S. The obituary notices are good, noticeable those on Coulter and Dyer. The usual additions and donations to the Library occupy fifteen pages.

London Naturalist, The. The Journal of the London Natural History Society. Hall, 40 Winchester House, Old Broad Street, London, E.C.3. President, W. E. Glegg. Bot. Sec., H. E. Spooner. *Aristolochia rotunda* L. in Surrey, p. 16. *A. Clematitis* L. in Trimen and Dyer's locality at Hampton Court, Middlesex. Brambles of Kent and Surrey, W. Watson, p. 21-26. A detailed list of the plants of the area is in the course of publication. Those included in this Report, pp. 9-16, run from Papaveraceae to Violaceae.

McKelvey, Susan Delano. The Lilac. A Monograph, with Contributions from Ernest Henry Wilson, Keeper of the Arnold Arboretum, who gives the History and Distribution; Alfred Rehder, Curator of the Herbarium, Arnold Arboretum, who describes the genus and its sections; Theodore A. Havemeyer, President, New Horticultural Society, who describes the culture, and Dr William T. Councilman, who treats of the insect pests and diseases to which the Lilac is subject. Demy 4to., pp. 597, with 172 full-page plates, 1929, Macmillan & Co., St Martin's Street, London; £3 15/- nett. The photographs (except four) reproduced by Mr George W. Root of West Roxbury. This complete and exhaustive classification of the popular genus, *Syringa*, with cultural notes, and full descriptions of species and varieties will undoubtedly become the standard authority and reference. The appearance of the book is distinctly pleasing, and it forms a volume worthy to be placed by the side of Millais' "Rhododendrons." Its value is enhanced by the inclusion of colour-charts, reprinted from colour standards and colour nomenclature, by Robert Ridgway. A removable folder contains plates of all the colours of Lilac species and varieties, to which are keyed the text descriptions. The subject of the Monograph was suggested some years ago by Professor Charles Sprague Sargent, and during his life-time he did everything possible to further its completion.

The 28 species of Lilacs treated of in the work, with two exceptions, belong to the Asiatic area. There are two in Japan, and two—*S. vulgaris* and *S. Josikaea*—are found in central and southern Europe. *S. Emodi* and *S. affganica* are Himalayan, four are indigenous in Korea, and seven in China. The most widely distributed species are the tree-Lilacs, *S. armurensis*, and *S. pekingensis*. The first, as a large bush or small tree, grows throughout the Korean peninsula, adjacent Manchuria, and in the region bordering the Amur river. It reappears on the mountains of Japan as the var. *japonica*, and is abundant in Hokkaido, where there are trees 45 feet high. No true Lilac is indigenous in Japan. Rehder gives a most excellent account of the genus, with key to the species. *S. reflexa* is beautifully photographed, but the fine range of colours is remarkable, and must be seen to be properly realised. *S. hyacinthiflora* is a charming hybrid of *oblata* and *vulgaris*, produced in France by Lemoine. The treatment, both pictorially and literary, of *S. vulgaris* is of the first order, extending to 198 pages, with 15 full-size plates. The index is copious and correct. Indeed the whole book is one of the most satisfactory Monographs we have met with.

MARLBOROUGH, REPORT OF THE NATURAL HISTORY SOCIETY OF, for the year 1928. Pp. 84; 5/-. Printed at the Cambridge University Press. Mr Peirson contributes the Botany, which includes many records already given in our *Report*. *Glyceria distans* is a new record for the Marlborough List.

MARIE-VICTORIN, FRERE. Le Dynamisme dans la Flore du Quebec. Contr. Lab. Botanique de l'Université de Montreal, n. 13, pp. 89, 1929, with many illustrations including a good one of a marsh field of *Butomus umbellatus*. Might one suggest that the author's names should appear after the specific names in the index? *L.c.*, n. 12, pp. 163-176, 1928. Deux épibiotes remarquables de la Minganie—*Cypripedium passerinum*, nov. var. *minganense* Vict., and *Draba luteola* Green, nov. var. *minganeisii* Vict.

MARQUAND, C. V. B. The Botanical Collections made by Captain F. Kingdon Ward in the Eastern Himalaya and Tibet in 1924-5. Journ. Linn. Soc., 154, 1929. 446 species, of which 52 species and 27 varieties are new, are here described. In this excellent work, Mr Marquand had the assistance of Mr H. K. Airy Shaw. There are a new *Thalictrum* and *Ranunculus*, two Larkspurs, one Aconite, three species of *Corydalis*, *Iberidella*, three *Lychnis*, one *Myricaria*, two *Impatiens*, one *Evonymus*, three Leguminosae, nine Saxifragaceae, including *S. Kingdonii*, one *Schefflera*, one *Senecio*, one *Saussurea*, one *Cyanathus*, one *Campanula*, one *Agopetes*, one *Gaultheria*, two *Buddleia*, one *Crawfurdia*, one *Gentiana*, a new Gentianaceous genus, *Kingdon-Wardii* Marq., one *Swertia*, four *Pedicularis*, one *Plectandrus*, one *Micromeria*, one *Phlomis*, one *Salix*, one *Arisaema*—among others.

NABELEK, Dr Fr. Iter Turcico-Persicum, pars. iv. Publication de la Faculté des Sciences de l'Université Masaryk. Treats of plants gathered from Acantholimon. Included are:—A new *Plantago—thrichophylla* Nábelek, *Allium trichocephalum*, t. 4, and *A. Fedtschenkoi* Nábelek, from Kurdistan, *A. Haussknechtii*, from Aleppo, *A. rhitoreanum*, from Kurdistan, *Uropetalum Susianum*, from S.E. Persia, and *Juncus Warakensis*, from Tauro-Armeno. Part v. treats of Gramineae-Cryptogamae, with the genera *Pentatherum* (*Calamagrostis* partim), and *Anatherum* (*A. tauricolum*), t. 1. *Koeleria Dominii* Náb., t. 2, from Tauro-Armeno, *Aeluropus mesopotamicus* Náb., t. 5, from Euphrates, *Agropyron Podperae*, t. 3, and *A. Kosanii*, from Kurdistan, are described as new species.

NATURE. Published by Macmillan & Co., Ltd., St Martin's Street, W.C.2. Editor, Sir R. Gregory. Weekly; 1/-. This most useful Journal goes on from strength to strength, and although necessarily the mass of matter it contains is beyond the purview of the field naturalist, yet even he cannot afford to neglect its pages. *Ranunculus acer*, subvar. *minutiflorus* Druce, in Rep. B.E.C., 24, 1923, p. 6. To this plant Dr Parkin and Dr Turrill have contributed additional knowledge. See pp. 413 and 568, where it is called a female form. When removed to garden soil it did not alter the size of the petals. The Supplements have been of great interest. A recent one on Lightning, by Dr G. C. Simpson, F.R.S., C.B., dispels a popular delusion about the actual cause of a thunderstorm. Some startling figures are given. The energy dissipated in an average lightning discharge is of the order of 3000 K.W.H. Swann says a column of air one inch long offers as much resistance to the passage of the electric current as a copper cable 30,000 million million miles long, and of the same cross section; that is, as much resistance as that of a copper cable long enough to reach from here to Arcturus and back twenty times. Although the conductivity of air is so small, yet it is by no means insignificant, since a charged insulated conductor exposed to the atmosphere loses some three per cent. of its charge a minute. Pringle's Geologic Aspects of the Channel Tunnel Scheme, p. 608. Greenland, as It Is and Was, by Prof. A. C. Seward, F.R.S., p. 456. Aspects of Fossil Botany, by Dr D. H. Scott, F.R.S., pp. 319, 350. Natural Hybrids in Plants, p. 587.

NEW PHYTOLOGIST. Editor, A. G. Tansley, F.R.S. Cambridge University; 25/-. Seedling Development in *Calluna*, Dr M. C. Rayner, p. 377.

NORTH WESTERN NATURALIST, THE. Edited by A. A. Dallman, F.C.S., in collaboration with nine other Scientists. Vol. iv. Published by T. Buncle & Co., Arbroath. Annual Subscription, 7/6. Many of the special items are included in our New County Records, etc. Records of the meetings of various Societies in the area are given at considerable length. A. Wilson contributes some valuable notes on the Flora of

Carnedd Llewelyn, p. 53. He makes some important records in plant altitudes. N. Woodhead, p. 59, gives a paper on the Distribution of *Lloydia serotina*. Obituary notice of Thomas Porter Blunt, of Shrewsbury, aged 86, p. 74. Although not specially a botanist, he was much interested in the local Flora. He was a valued and dear friend, and was a fellow-examiner with me at the Pharmaceutical Society for many years. He took first-class honours in Natural Science from Magdalen College, Oxford, and had the honour of rowing for his College. Variation in *Veronica hybrida*, M. Gepp, p. 134. Pink-flowered forms occurred with the ordinary form in Shropshire and Montgomeryshire. This variety had long been known in Denbigh. Mr J. Griffith, of Bangor, grew it for many years, and in his garden it bred true. The white-flowered form also grew with it, and was found to be constant in culture. A note to this effect is added by the Editor. Albino *Fritillaria Meleagris* L., near Benthall Hall, Shropshire, George Potts, p. 135. Perhaps introduced by the former owner of Benthall, Mr George Maw. Flora of Cader Idris, Dr J. H. Salter, p. 136.

OSTENFELD, C. H. Genetic Studies in *Polemonium*. Experiments with *P. mexicanum* Cerv. × *P. pauciflorum* Wats. Separate from Heereditas xii., 1929.

PARKIN, JOHN. The Glossy Petals of *Ranunculus*. Annals of Botany, vol. xlii., July 1928. The glossy yellow of the buttercup petal, Dr Parkin says, is probably unique. It is confined to the single genus, *Ranunculus*, including *Ficaria* and *Ceratocephalus*. The peculiar features responsible for the gloss are:—(a) A perfectly smooth upper epidermal layer of narrow cells with hyaline contents, consisting of yellow pigment dissolved in a higher refractive oil. (b) A compact subepidermal layer crammed with starch granules. The layer, contrary to the views expressed by previous investigators, is apparently more than one cell thick. His investigation leads him to believe that glossiness is a character of first class phylogenetic, and so of taxonomic, importance within the genus, permitting it to be sharply divided into two sub-genera, the one containing the glossy, and the other the mat-petalled species.

PEARSON, H. H. W., D.Sc. Gnetales. Edited by A. C. Seward. Pp. 194, tt. iii. Cambridge University Press, 1929; 18/-. The excellent photograph which prefaces the volume recalls vividly to my mind my last sight of him. I had been to tea with General Botha in 1914, and while walking back to Cape Town over a portion of Table Mountain, I met a soldier who had been in the Oxford Post Office, just waiting to start to somewhere in Africa, when suddenly Pearson appeared. Despite the dread uncertainty of war and its consequences, he was looking forward with eagerness to continuing his researches on *Welwitschia*. Almost the last words he said, when saying good-bye, were to promise to send me photographs of this interesting group. As we know, his life was cut short ere it had well begun. He died on November 3, 1916.

Fortunately he was able to continue work and he visited the *Welwitschia* area. Gnetales is represented by three genera, *Ephedra*, *Gnetum* and *Welwitschia*. They have few species. There are five European species of *Ephedra*, and 27 extra-European, in all 32. There are about twenty-five tropical species of *Gnetum*, but *Welwitschia* is a monotypic genus, with one species only, *mirabilis*. The areas of the 32 Ephedras are given, as also the Gnetums, which are mostly lianes. Three are found in the Guianas, seven in Brazil, one in Ecuador, and one in W. Indies, while in tropical Africa the Cameroons have one, and Angola one, while tropical Asia has nineteen. Curiously enough there appears no reference to the earlier name, *Tumboa Bainesii*, given to this species by Hooker in *Gard. Chron.*, 1008, 1861. *Welwitschia* was published in the same Journal, 71, 1862. It may be remarked that this curious plant was successfully cultivated in the tropical orchid-house at Cambridge. Eight chapters are devoted to the Morphology and Anatomy of the three genera, which are illustrated by 88 good text-figures. The inter-relationship of the Gnetales is treated of in chapter v. and there is a good Bibliography. The volume is a distinctively valuable contribution to the knowledge of some very curious plants, one indeed, being " mirabile !''

RAYNER, J. F. A SUPPLEMENT TO TOWNSEND'S FLORA OF HAMPSHIRE AND THE ISLE OF WIGHT. Pp. xix., 132, 1929; 6/-. Printed by T. Buncle & Co., Arbroath, and published and sold by the author. It is a quarter of a century since Townsend's Second Edition of the Flora was published, so it was high time for this Supplement to appear. There was a very heavy loss on Townsend's work as the sales were very small; and it was an expensive book to produce. The preface in this work strikes a somewhat despondent tone when speaking of the disappearance of some of the rarities. But even those he mentions need some corrections. For instance, *Leersia*, as it is called, has not " long vanished from the neighbourhood of Brockenhurst," for I saw it there in July. But the fact that 60,000 houses have been built in the county since the end of the war shows how rapidly the destruction of rural areas is going on. He alludes to the spread of certain species since the publication of Townsend's Flora—*Matricaria suaveolens*, *Spartina Townsendii*, *Crepis taraxacifolia*, *C. biennis*, *Mimulus guttatus* (*Langsdorfii* is a nomen abortivum), *Epilobium angustifolium* and, in a smaller degree, *Euphorbia Cyparissias*. Notwithstanding its appearance in the list of plants, *Carum Bulbocastanum* should be deleted since there is no adequate record of it in the county. *Stellaria dichotoma*, p. xiv., is a lapsus for *Silene dichotoma*. We have nothing but praise for the supplement proper, and there is an immense amount of new material added to the Flora of the county. The citations of Mr Groves might now be omitted since Mr Pearsall has supplied a most useful Monograph of the Batrachian Ranunculi. We regret to see such obsolete names as *Sisymbrium pannonicum* and *Columnae* used for *altissimum* and *orientale*, and *Erythraea* should be replaced by *Centaurium* Hill. One doubts if *Hieracium dumosum* Jord. covers all the plants given under it. And is *Hiera-*

cium aurantiacum N. P. = *brunneocroceum* Pugsley? Some of the localities of *Orobanche major* (here wrongly used in the place of *O. Rapum-genistae*), belong to *elatior*, which is the true *elatior* L. Mr Hunnybun's specimen of *Stachys germanica*, from Steephill, Isle of Wight, is not that species. I have elsewhere pointed out that it is *S. lanata*; *germanica* must be deleted. *Orchis elodes* is the true *O. maculata*. *Panicum lineare* Knocker [Krocker] should be *P. Ischaemum* Schreb. and may be corrected in another edition, which we hope Mr Rayner will one day issue. The type is clear, and there are few errors. We congratulate Mr Rayner very warmly upon producing so useful and so compact a volume which we trust will have a large sale so that its compiler will not suffer any monetary loss after all the labour he has spent upon this valuable Supplement to one of the largest and best of British County Floras.

RAYNER, M. C. The Biology of Fungus Infection in the Genus *Vaccinium*, in Annals of Botany, vol. xlviii., 55, 1929. Among the results, it shows that in *Vaccinium Myrtillus* and other species ovarial infection by mycelium has been observed . . . and it is clearly impossible to raise seedlings of *Myrtillus*, free from Fungus infection, by sowing seeds of this species in sterilised soil.

ROBERTS, H. F. PLANT HYBRIDIZATION BEFORE MENDAL. Princeton University Press; H. Milford, Oxford University Press, Amen House, Warwick Square, London, E.C.4. Pp. 374, tt. xxxvi., 1929; 18/-. This is the only book dealing adequately with the work in the hybridization of plants before Mendel. The pre-Mendelian work has been gone through with thoroughness and in detail, and the body of material of interest or value sifted out and clearly presented. The work of Kolreuter has been analysed with great care, and the genetic bearing of his numerous experiments brought as clearly as possible into relief. The work of the series of German hybridizers—Gartner, Wiegmann, Wichura, Nageli and Focke, as well as the work of Knight, Herbert and Laxton in England, and of Sageret, Naudin, Godron and others in France, has been thoroughly and carefully dealt with, and many interesting details of genetic value or interest rescued from oblivion. This work comes out at an opportune moment, since at present Mendelism is assumed by many people to be the alpha and omega of this subject. The author opens his discussions by alluding to the very early times when in the lower basin of the Tigris and Euphrates rivers, to-day known as Iraq, civilisation had well begun. As far back as 6000 years ago it was occupied by an orderly and settled people, who possessed both domesticated plants and animals. The culture of dates in Mesopotamia is demonstrated in the monuments erected there which have on them representations of the process of hand-pollination of the Date Palm, a tree of the greatest value. Strabo refers to 360 uses for the plant. In 1283, an Arabic writer, Kazwini, says in his book, " On the Marvels of Nature and the Singularities of Created Things "—" The Date has a striking resemblance to Man through the

beauty of its erect and slender figure, its division into two distinct sexes, and the property, which is peculiar to it, of being fecundated by a sort of union." But the knowledge did not spread, nor were its effects carried further. It was left to Camerarius, when a Professor at Tubingen, in 1694, to write a letter to Prof. Michael Bernard Valentin of the University of Giessen, entitled " De Sexu Plantarum Epistola," which recounts the knowledge already obtained, and the results of his own experimental work, and here for the first time there is an actual scientific investigation into the question of the existence of sex in plants, for although earlier writers, Theophrastus and others, had alluded to the sexes in plants, they had supplied no actual experiments for determining the facts. He found by actual experimentation that pollen is indispensable to fertilisation. It was quite 50 years later before these investigations upon sex in plants received substantial recognition and before the first recorded instance of an actual experiment in hybridisation. A full and excellent record of Linnaeus' treatment of the subject is given. He describes four hybrids. One of them he made by crossing *Tragopogon pratense* with *T. porrifolius*, and the offspring had purple flowers with yellow bases. A natural hybrid, *Veronica maritima* × *Verbena officinalis*, is described by him in great detail in 1750, and a figure is given. It produced no fruit, and had to be propagated by suckers. This precedes Kolreuter's *Nicotiana* hybrid in 1760, which marks the beginning of genetic investigations. Haartman wrote a treatise on " Plantae Hybridae " in 1751, which, among other plants, includes *Trifolium hybridum*, which he thought to be *T. repens* × *T. pratense* (see p. 44). It is said to have originated not only near Upsala but near Aloa. The author does not say whether he accepts this origin for the Alsike Clover. Kolreuter's work and numerous experiments are well described, and the chapter is of great value. Through Millington, Philip Miller, James Logan, Gleditsch, Gartner, C. K. Sprengel, whose work Sachs says is " the first attempt to explain the origin of organic forms from definite relation to their environment," the development of the subject is admirably traced. The labours of T. A. Knight, an early English hybridist, are given, and there is an appreciation of him by W. W. Focke. Then Dean Herbert's experiments are given. He specialised on showy garden plants, while Knight's experiments were chiefly on fruits. In later times John Goss, Alexander Seton, and Thomas Laxton contributed their share in investigations, while Patrick Sherriff experimented with cereals. In France, Sageret, Godron and Naudin made important discoveries. Then came Verlot, the Vilmorins, and Lecoq, to carry on the work. Germany also had Weigmann (1822) and Von Gaertner, who spent 25 years in his hybridisation experiments. No fewer than 10.000 in number were carried out among 700 species belonging to eighty different families, obtaining 350 hybrid plants. Wichura (1865) experimented chiefly with Salices. Nageli (1868) presented a survey of the work of the earlier hybridisers, a year after the paper of Mendel had been published at Brunn. The excellent account is closed by a study of the work of W. O. Focke, our old Rubi specialist, who issued *Pflanzenmischlinge* in 1881,

which he describes as " the most thorough and extensive single compendium yet published." Hoffmann (1855), Charles Darwin, and Francis Galton are faithfully dealt with, and the whole book is a highly valuable treatment of a subject which teems with interest. The book is well printed, well written, and well illustrated, and should have a large circulation.

SALTER, J. H., D.Sc. THE ALTITUDINAL RANGE OF FLOWERING PLANTS AND FERNS IN MID-WALES. North Western Naturalist, September-December, 1928. This publication supplies a long felt want, and it gives many new altitudes for common plants. We have plants cited whose upper limit is between 900-1000 feet, 1000-1250 feet, 1250-1500 feet, 1500-1750 feet (this includes the upper sheep-walks), 1750-2000 feet, and lastly above 2000 feet. The last are all native species. It is shown that several species reach a higher altitude in S otland than in Mid-Wales.

SALISBURY, Dr E. J. The Biological Equipment of Species in Relation to Competition. Journal of Ecology, pp. 197-222, August 2, 1929. In this interesting paper Dr Salisbury mentions that a plant of *Verbascum Thapsus* may yield 700,000 seeds, but of these only 108 remain after six months, scattered only as far as 30 feet from the parent plant. *Clematis*, it is said, has only 2 per cent. of viable seeds. *Desmarestia loliacea* is unknown to me—can it be *Desmazeria*?

SCHROETER, C. Eine Exkursion ins Tenggergebirge (Ostjava), in Verhl. Nat. Gesell., Basel, xl., 2511, 1929. A delightful account by our veteran botanist of one of the most beautiful spots of the world. He has wonderful photographs of *Alsophlia glauca* at 1900 metres, and of the Bromo-Krater. The dunes, too, are well represented with *Styphelia pungens* as a conspicuous feature. It is very gratifying to find Dr Schroeter in such good health and spirits—may that long continue.

SCHULZ, O. E. PLANTAE SINENSIS. Collected by Dr H. Smith, 1921-2. VI. Cruciferae, pp. 157. Include a new *Erysimum*, *Cardamine*, *Luxostemon*, *Hesperis*, and *Draba remotiflora*. *Brassica juncea* occurs, the authors of this species being given as Czern. & Coss.

SCHULZ, O. E. Beitrage zur Kenntnis der Cruciferen des N.W. Himalaya-Gebirgen, in Notiz. Bot. Gart. Berlin-Dahlem, 1057, 1926. Two new species of *Arabidopsis*, four new species of *Arabis*, two new *Cardamine*, one *Cochlearia*, one *Draba*, four *Erysimum*, one *Graellsia*, one *Isatis*, one *Malcolmia*, two *Microsisymbrium*, and a new monotypic genus, *Phaeonychium* O. E. Schulz, are described. *Cheesemannia*, a new Australian Cruciferous genus, *l.c.*, 551, 1929, with five species. Hooker had put *radicata* into *Cardamine*, and two others were placed in *Nasturtium* by Cheeseman. *Fastigiata* was named an *Arabis* by Hooker.

SIRJAEV, G. Generis *Trigonella* Revisio Critica, ii. Publication de la Faculté des Sciences de l'Université Masaryk. This treats of species beginning with no. 24, *laciniata* (List no. 17), to 39, *smyrnaca*. A very complete citation of localities, with maps showing distribution, are given, and lists of Icones and Exsiccatae. Two plates are supplied, t. vi. being one of *T. Falcata* from Socotra.

Soó, Dr R. Sur Systematik und Soziologie der Phanerogamen Vegetation der Ungarischen Binnengewasser, in Archiv. Balalonicum 45, 1928. A key to *Callitriche* is given on p. 58.

1a. Fructus late alatus, longitudine latior, 2 mm. latus, ... *C. stagnalis.*
1b. Fructus vix vel angustissime marginatus, ... 2.
2a. Stylus basi refractus, fructu adpresso. Fructus isodiametricus, 1.2-1.5 mm., ... *C. hamulata.*
2b. Stylus basi erectus, ... 3.
3a. Stylus 4-6 mm. longus, remanens, fructus longitudine latior, 1.2-1.5 mm. latus, ... *C. polymorpha.*
3b. Stylus 1-2 mm. longus, mox deciduus, fructu latitudine longo, 1 mm. longus, ... *C. verna* L.

Many forms are described under each species, and there is a very critical treatment of *Hippuris*, *Myriophyllum*, *Utricularia*, etc.

Soó, Dr R. Kritische Bernerkungen, iii., in Rep. Botanika Kozlemények, Band xxv., 133, 1928. It includes several varieties of *Ophrys* and *Orchis*. Under *Orchis incarnatus* he has f. *rhombeilabus* Reichb., f. *retusus*, f. *rostriformis*, f. *macrophyllus*, f. *stenophyllus*, f. *subfoliosus*, f. *brevicalcaratus*, and f. *albiflorus* Lec. & Lam., var. *ochroleucus* Boll.= *stramineus* Reichb., var. *extensus* Hartm. and *sublatifolius* A. & G. There are also many varieties under *latifolius* and *maculatus*, under which *helodes* is kept distinct as a sub-species.

Soó, Dr R. Orchideologische Mittelungen, i.-iii., in Fedde Rep., 273-280, 1929. Several new forms from the Ionian Isles. He supplies most valuable notes and descriptions of the genus *Ophrys*, which he divides into (1) Musciferae, (2) Fuciflorae, (3) Araneiferae, (4) Euaraneiferae Soó, (5) Sprunerianae Soó, (6) Apiferae, (7) Oestriferae Soó, (8) Euapiferae Soó and (9) Bombyliflora. A large number of new combinations are given.

STANSFIELD, F. W., M.D. Fern Gazette. Vol. vi., No. 1, December 1929. Contains an interesting note on *Cystopteris alpina* Desv. by F. W. Stansfield and S. P. Rowlands.

THURSTON, E., C.I.E. The Alien and British Plants of Par and Charleston Harbour, Falmouth Docks, and Easter Green, Penzance. Journal of Royal Soc. Cornw., No. 76, pp. 137-206, 1928. Includes about 400 species and many varieties. Most, if not all of them, have been mentioned in our Reports and many of them are common constituents of our Flora. The noticeable ones include *Eschscholtzia crocea*

Benth., which in Ind. Kew. is reduced to *E. californica*; *Thlaspi perfoliata*, Falmouth; *Linaria Pelisseriana*, once seen at Par; *Orobanche reticulata* Wahl., Falmouth Docks, and *Dipsacus*. The *Festuca dumetorum* L. is probably different from the Skegness plant. Notes on the Cornish Flora, *l.c.*, 1929.

TORREY BOTANICAL CLUB, BULLETIN OF THE. Editor, Tracy Elliot Hazen. Some Juncus names, K. K. Mackenzie, p. 25. *J. tenuis* is referred to among the new plants. H. A. V. Gleason, Flora of South America, pp. 1, 97, 391. Albert Saeger, The Flowers of Lemnaceae, p. 351.

UKRAINE, BOTANICAL REVIEW. Vol. iv., 1928. Vol. v., 1929. The Ukranian Botanical Society. Includes the Flora Podoliens, G. D. Pleopow. Flora Letitschewsches Kreises auf Podolien. Material . . . flora de Longausk, N. Pidoplitshka.

WASHINGTON, UNITED STATES DEPARTMENT OF AGRICULTURE. The year 1929 shows no sign of diminution in the energy displayed by this great organisation. The Farmers' Bulletin, No. 1555. W. A. Taylor gives an account of Peppermint and Spearmint as farm-crops. The cultivation is centralised near Indiana, Michigan, Western Oregon, and Washington. About 32,000 acres are under *Mentha piperita* and 3300 under *M. spicata*. There are also smaller areas in the north-west Pacific. The industry was introduced more than a century ago in Wayne County. In the eighties, Hotchkiss oil of Peppermint was a keen rival of our English oil. Two varieties are grown—the black and the white mint. The former, imported from Britain, proved the better, and it is now almost exclusively grown. They prefer deep rich soil, well drained, but retentive of moisture, and experience shows that clay is unsuitable and a non-acid soil important. Rye is grown between the crops as a wind-break. Important cultural information is supplied as well as information about the stills. The yield of oil varies greatly according to the seasonal conditions, the characters of the crops, and the geographic location. In Michigan and Indiana thirty pounds per acre is a fair average, but in Oregon and Washington as much as 80 or 90 pounds have been obtained, the average bags about 50. This holds true of both Spearmint and Peppermint. The average price of Peppermint oil is $3 a pound. Next to the United States, Japan has the greatest output, but that is from a variety of *M. arvensis*, and the oil is used to prepare Menthol.

Circular 66. Cacti, by David Griffiths and C. H. Thompson. This has a splendid plate of *Opuntia brachyclata*. There are most useful details as to their cultivation. Many illustrations are supplied, including one of an avenue of *Lamairocereus stellatus* at Tomellin, Mexico. An account of their economic value is supplied, with reference to their uses as food. In Mexico, the fruit of the *Tuna* forms a considerable part of the diet of the poorer natives. In Britain they are now un-

popular since formal and carpet-bedding are no longer fashionable. A list of the Cacti now in cultivation in the United States is appended, with an indication of their size.

Technical Bulletin, 96, gives the Yields of Barley in the United States and Canada, 1922-1926, by H. V. Harlay and others.

Department Bulletin, 1498. Distribution of the Classes and Varieties of Wheat in the United States, by J. Allen Clark and others, May 1929. The Wheat acreage in 1919 was 73,099,421 acres—a war time crop. In 1924 it had sunk to 50,862,230 harvested acres of wheat, and the average of recent years is about 58,000,000. The acreage and the wheat varieties grown are given in an exhaustive manner.

Leaflet No. 43. Wild Garlic and its Control. This is our *A. vineale* which is locally and generally abundant in cornfields in the Eastern States. "Reproducing as it does by hard-shelled bulbs, soft-shelled bulbs, aerial bulblets, and sometimes by seed, the plant is renewed practically continuously." Practical, though laborious, instructions are given to diminish the numbers of this agricultural pest.

The Farmers' Bulletin, No. 1602. Reed Canary Grass. This is our *Phalaris arundinacea* which is recommended as a pasture grass for rather swampy land. On the Pacific coast it may furnish pasture for nine months in the year. Its use for hay is increasing, as also for silage, which is a palatable and nutritious feed. The yield in seed is very variable, running from 30 to 150 pounds per acre. An average person will harvest from 20 to 40 pounds of seed per day, its average price being from $1 to $1.50 a pound.

The Farmers' Bulletin, No. 1591. Transplanting Trees and Shrubs, with many illustrations.

The Farmers' Bulletin, No. 1587. Mushroom Culture for Amateurs. With the disappearance of horses in Britain, the wild mushrooms are becoming increasingly scarce, and the Bulletin says "at the present time there is no substitute for horse manure on the market."

WATSON BOTANICAL EXCHANGE CLUB. Distributor, E. C. Wallace. Secretary, H. Stuart Thompson. The 45th Annual Report, 1929. In the year, 1942 specimens were distributed.

WHITE, GILBERT, FELLOWSHIP. President, Sir R. Gregory, D.Sc. Hon. Secretaries, Miss W. M. Dunton and Mr G. J. B. Fox. Annual subscription, 7/6.

WILD FLOWER MAGAZINE. This continues its triumphant career under Mrs Dent's guidance. We deeply sympathise with her in her long illness, and most sincerely hope she will soon be restored to health. We notice with special pleasure that Mrs Foggitt, née Gertrude Bacon, had a most acceptable wedding present in the shape of a very fine Halcyon portable wireless set, whose dulcet notes one had the pleasure of hearing at their charming residence at Thirsk last August. Miss Maud Robinson contributes a pleasing paper on the Joy of a Rubbish

Heap. One may note that in the June-July number Mrs Randall Mason is stated to have found *Crepis paludosa* in Berks. We can assure her that this is a mistake—the plant does not grow in that county. *Urtica pilulifera* is said to be flourishing like a weed at Ashridge Park from seeds brought from Rome in the seventies. Mrs M. E. Bunyard gives a note on Braunton Burrows.

WATSON, WILLIAM. Brambles of Kent and Surrey, 1928. Report in the London Naturalist, August 1929. A very useful paper treats of *Rubus silvaticus, myricae, hesperius, egregius* var. *plymensis, sciaphilus* forma *microphylla, Nitidioides* nov. sp., *orthoclados, macrophyllus, Schlechtendalii, Macrophylloides, Questierii, Colemanni, Sprengelii,* and *scanicus.*

NEW ZEALAND INSTITUTE, TRANSACTIONS AND PROCEEDINGS OF. Vol. 59. Edited and published under the authority of the Board of Governors of the Institute. The botanical portion includes an able Revision of the Genus *Dracophyllum,* pp. 678-714, by W. R. B. Oliver, M.Sc., F.N.Z.Inst., Director of the Dominion Museum, Wellington, 21 species being figured. Vegetation of the Upper Bealey River Basin, with a list of the species, by R. M. Laing, pp. 715-730.

ZURICH, Der Botanische Garten und das Botanische Museum der Universitat, for the year 1928, by Dr Hans Schinz, 1929.

ZURICH, UNIVERSITAT. Rektoratsrede und Jahresbericht. April 1928, bis ende März, 1929, pp. 65. This contains an excellent portrait of Dr Albert Thellung, and a memoir by Dr Hans Schinz.

OBITUARIES.

BECKER, WILHELM, of Kirschmoser. Died October 12, 1928. Author of a Monograph of *Viola*.

BENNETT, ARTHUR. Born at Croydon, June 19, 1843; died there, May 2, 1929. On May 2, when in London, finding that I had two hours to spare, I went to call on him at Croydon, and was shocked to find that my old friend had died only a few hours before, his death being due to heart failure after an attack of bronchitis. Thus British Botany lost one, if not its most, industrious worker. There seemed to be nothing in his forebears to account for his line of research. It is another example of the many mental idiosyncrasies which occur. He had in a high degree the love of work for its own sake. Just a century and a half before, George Don had shown the same power of concentrating on a life of toil and hardship and getting from it—as every real worker must—a reward in the discovery of new plants to his country. As I said when I unveiled a monument to his memory: "To those whose only standard of success is opulence, his life would be pronounced a failure; to those who love care and luxury, his career would be looked upon as insanely miserable; yet I doubt if the wealthiest millionaire ever derived as much satisfaction from the accumulation of his riches as Don experienced in finding a new species, or if the most self-indulgent individual ever obtained so exquisite a pleasure as Don enjoyed in those high alpine journeys where, in the purest air, among the tumbled fragments of the hills, with the sense of unutterable calm, only broken by the soft sound of distant streamlets' fall, or the plaintive notes of the Curlew and the Golden Plover, Don held his communing with Nature." So with Arthur Bennett. After leaving school, he went into his father's business of builder and house decorator, to which he eventually succeeded. There, in the hours he snatched from his business, he devoted himself to studying the flora of his country and entered upon a large correspondence to keep himself in touch with its development.

My own correspondence with him began in 1876 when I gave him the locality for *Senecio paludosus* in Norfolk, which a non-botanical friend of mine had discovered. Although out of place here, it may be worth while to put the find on record. A fellow-founder of the Northampton Natural History Society, Mr C. Jecks, who had some connection with Norfolk, was going to spend a month near Filby. His interests were Geological, but he asked if there were any plants from there that I would like. The fen ragworts and *Sonchus palustris* leapt to the eye, and I showed him *S. arvensis* and *Pulicaria*, saying I wanted something like these, explaining, as well as I could, the salient features of the wished-for plants. In the autumn I went to his Northampton house to see the results. There was a stack of "The Times," four feet high,

filled with hundreds of yellow-flowered Composites, *Sonchus, Senecio, Bidens, Pulicaria*, of the common kind by hundreds, and, as luck would have it, two or three fragments of *paludosus*. He could not recollect where these were gathered, except that he was certain it must be near Filby Broad. So, not very hopefully, I went down to explore, and on the second day hit upon the place, where about a score of plants were growing magnificently on quaking ground which surged as one went on to it. Alas, the place became known, and the plants fell a prey. Bennett was delighted with this acquisition. In 1883 (*Journ. Bot.*, 246, 1883) he added a species new to Britain—*Naias marina* L., found on July 21, 1883. Bolton King and I independently found it in the early August of that year. But his first addition to the British Flora was made on September 23, 1880 (*Journ. Bot.*, 319, 1880) in the plant now known as *Nitellopsis obtusa*, also from the Norfolk Broads. Norfolk and Suffolk were favourite counties of his, and on them he made some valuable comital notes. The Pondweeds gradually became his chief love, and on this genus he was the foremost authority. Not only had he a thorough knowledge of the British species but he had the advantage of seeing the Kew specimens, and his assistance to that Institution in giving valuable aid is acknowledged by Sir Joseph Hooker (*Fl. Brit. India*, vi., 565). His help, too, is acknowledged in the *Flora Capensis*, vii., 1897; the *Flora of Tropical Africa*, viii., 1901; and in the Student's Flora, where Hooker alludes to his unrivalled knowledge. He also determined the Pondweeds for the British Museum, and those of the Dillenian Herbarium. To the *Journal of Botany* he was a copious correspondent, contributing 243 notes, papers, and reviews. Only in one year out of 53 did he fail to send some note.

He was fortunate in adding *P. lanceolatus* Sm. from Burwell Fen, Cambridgeshire. This, like the Anglesey plant, is now admitted to be a hybrid, but Hagström doubted if the Burwell and Clare plants had the same parents as the plant from Anglesey, and as *coloratus* occurs both in Cambridgeshire and Clare it indeed seems probable that these two plants are *coloratus* × *pusillus*. Bennett, however, did not agree to this origin of the Burwell plant. Bennett named a pondweed which J. Griffith found in Llyn yr Afon, above Aber, as a new species, *P. Griffithii*. This was one of the plants which Fryer could not obtain, so I went to the lake and, with much discomfort, gathered rooting specimens. I could only see *oblongus* growing there, so no support has yet been found to support Hagström's and Graebner's view that it is × *nerviger*—an identification strongly opposed by Bennett. This alpine lake should be well explored. Bennett also identified *P. alpinus* × *lucens* = *P. upsaliensis* from Bindon, Dorset (*Journ. Bot.*, 306, 1916), *P. oblongus* × *praelongus* = *P. Macvicarii* (*Ann. Scot. Nat. Hist.*, 106, 1907), *P. lucens* × *praelongus* = *P. Babingtonii*, × *P. decipiens*, var. *affinis* and var. *salicifolius*, × *P. undulatus* Wolfg., *P. mucronatus* × *obtusifolius* = *P. semifructus*, *P. pusillus*, var. *similis*, and *P. Sturrockii* Ar. Benn. (Hagström thinks the Scottish *Sturrockii* is *obtusifolius* × *panormitanus*). These are only pickings from a great mass of work.

A new star had risen in the East—Alfred Fryer, a man with an extremely different mentality from Bennett. Knowing the fenlands intimately, he worked assiduously at the Pondweeds, and described with great detail the *P. gramineus* section, naming *P. Drucei*, *P. falcatus*, *P. crassifolius*, *P. varians*, etc. He also began a Monograph of the British Pondweeds, with beautiful plates of the various species in colour. Unfortunately, when about a third of it had been published, he died. This gave rise to a long delay. Eventually Dr A. E. Evans completed a second part (pp. 57-76) which Fryer had in unfinished MS., the grass-leaved section being untouched. This Arthur Bennett described in eight species (pp. 77-91). I am bound to say that this part, when completed, a little disappointed me. One missed the minute and vivid descriptions of Fryer, and one felt that Bennett had not done himself justice, as he had not taken sufficient toll of his great stock of knowledge. This, he explained to me, was partly caused by the hurry in which it had to be written. One could have wished also to see a more minute account of the distribution of the plants throughout the British Isles. For instance, instead of Anglesey being given for *P. rutilus*, its more precise habitat, Llyn Coron, should have been added.

The Carices, too, were a favourite genus, but with these he was not so successful. Four at least are misnomers, *C. Elytroides* (*Journ. Bot.*, 117, 1889), *C. trinervis* (*Journ. Bot.*, 125, 1884), *C. ligerica* (*Journ. Bot.*, 244, 1897), *C. caespitosa* (*Journ. Bot.*, 259, 1897). However, he detected *C. helvola* Blytt in Balfour's Herbarium (*Journ. Bot.*, 149, 1886). *C. salina* Wahl. and × *C. Grantii* were also named by him.

Bennett was a good letter writer, and he had a wide range of correspondents scattered over Britain. They sent him myriads of specimens. By casting his net thus widely on the waters, its meshes retained many fishes, which he was able to identify, otherwise they would have been sailing unknown amid the waters. Thus came *Potamogeton Griffithii* and many Scottish specimens from Grant, Macvicar, Duncan, Sturrock, and Knox.

My own correspondence, beginning in 1876, continued to within a week or so of his death. Years ago Miss Palmer and I found a Pondweed in the canal at Odiham which seemed different from *P. alpinus*. I thought *P. praelongus* was the cause. It appeared in my List as ? × *Palmeri*. Bennett, in those early days, said he would only name it *alpinus*, but almost the last letter I had from him he advised me to name it var. *Palmeri*. We did not always agree on nomenclature. He belonged to the school of Buchenau which, ignoring priority, chose the first name which unmistakably described the species. So Bennett would never adopt *P. gramineus* for *P. heterophyllus* or *P. compressus* for *P. zosterifolius*. To "The Scottish Naturalist," "The Annals of Scottish Natural History," the short-lived "Scottish Botanical Review," and the "Transactions of the Botanical Society of Edinburgh," he was a most prolific and valued contributor. A list of the chief papers to the first three mentioned is appended. His favourite areas were Caithness and the Ebudes, and for some years he kept the specimens from the latter

area separate from his general herbarium. Grant of Caithness and Duncan of Scarp sent him many things. A sedge from Harris was named by him × *C. spiculosa*, var. *hebridensis*. The objection to the determination was that *salina* (one of the parents of *spiculosa*) was not known for the West of Scotland. I made a prolonged but vain search for it last year. *Salina* is a littoral sedge or grows by brackish water. The habitat, whence *spiculosa* came, was about 300 feet above Langavat, itself a fresh-water loch, not near the sea.

Bennett was a valued expert and helper to our Club, which he joined in 1875. He was one of our four corresponding members, and had he lived he would have been made an honorary member. The large pile of letters before me is an evidence of his industrious help. He said that he always liked to put one interesting point in each letter.

Despite much domestic trouble (his daughter suffering from mental disorder and he himself being at one time in very straitened circumstances), he was cheerfully and kindly disposed. I am glad to say that our members very gladly responded to an appeal I issued, and we were able to hand him a substantial sum which helped him in a time of dire need. He was a Fellow of, and a frequent attendant at, the Linnean Society, and in 1910 was made an A.L.S.

He assisted Paul Graebner in preparing the Pondweeds for the "Synopsis der Mitteleuropaischen Flora," who says, p. 537, "dem vorzuglichen Kenner der Britishchen Flora und vor Allem der gattung Potamogeton (Vgl. S. 456) Wir sind demselben für manche freundlich ertheilte Aufschlüsse verpflichtet auch Graebner wurde bei seiner Bearbeitung der Familie in Engler's Pflanzenreich (iv., 11) von ihm aufs Thatkräftigeste unterstutzt," and he was also responsible for the Pondweed List in two or three Editions of "The London Catalogue."

He was certainly one of the great amateur botanists of his time as is testified in the prefaces of so many Floras to which he had given help. His British Pondweeds are left to the British Museum, his foreign ones to Kew, while the rest of his herbarium went to C. E. Salmon (where I saw part of it only recently). Owing to Salmon's death that will now go to Cromwell Road. Fryer named × *P. Bennettii* = *obtusifolius* × *pusillus*, a rare hybrid, in his honour.

Arthur Bennett, who was greatly interested in the comital distribution of plants, prepared a Supplement to Watson's "Topographical Botany." This appeared in the "Journal of Botany" for 1905. It was neither well arranged, nor were the citations uniform, or, indeed, in many cases correct. For instance, Newbould is cited for hundreds of county records for counties he had never been in. The majority of these were my findings which I handed to Newbould for insertion (as mine) in a new edition of "Top. Bot." But the Supplement contains an immense amount of detailed work. There are many hundreds of records which Bennett had culled from various sources, many being actually sent in to him as vouchers by his numerous correspondents. In 1929 a second Supplement, in the preparation of which he was aided by C. E. Salmon and J. R. Matthews, began to appear. This contains a

large number of additional records, some, however, being duplicated, while others do not show whether they are real additions or merely vouchers for a record without personal authority. It is not generally understood that these blank records in "Top. Bot." are in the main taken from printed works, and although of an older date, are not less trustworthy. To give a concrete case, Sibthorp wrote a "Flora of Oxfordshire" in 1794. Watson did not take this as evidence for Oxford, but preferred a marked catalogue by Thomas Beesley, which had no greater claim to accuracy. Indeed, Beesley marked *Ranunculus hirsutus* but, as I afterwards found, it was a hairy form of *repens*, while his *Chenopodium urbicum* was an *Atriplex*. *Teucrium Scordium* is left blank, but the authority should rest on Sibthorp's accurate record. I need not point out the uncertainties respecting these marked catalogues. Those for Flint and Carnarvon have been very adversely criticised. However, the things that stand clearly out are the impetus Bennett gave to other workers and his own unwearying industry in his subject.

As a writer he had a confused style, and too often overloaded the point with irrelevancies. But, again, that was more than compensated for by the intense pains he took to help his correspondents and to bring forward any possible information bearing upon the point at issue.

A few extracts from his correspondence are appended:—

May 5, 1888.—I have not sent you back yet the rest of that *C. flava* f. (this he afterwards named × *C. Marshalli*). It is certainly a curious var. which perhaps needs a name, but I want first to look through all the European and American forms of it. I object most decidedly to the use of *Buda* and *Tissa*, instead of *Lepigonum*. Adanson did not know that both his genera could be found on one plant, or he would not have published them. And why *Buda?* because Dumortier has it—to me a reason absolutely without reason to induce one to accept it. I have written Britten a note. I did mean to keep out of this naming business, but this is so outrageous I could not but explode. I object to *Myosotis Scorpioides* L. being used for any of the same species. It may be divided ? into . . . it becomes an aggregate species, and all its parts should have the earliest name they were put under as a segregate.

September 25, 1891.—I have retained one specimen, a "*Sagina*." I am quite in doubt what it is . . . it is very interesting. I cannot make anything of it except it be *S. maritima*, var. *alpina*. I have never seen a specimen of it before. If so it be, and what else is difficult to say—certainly not *nivalis* [this was my Glen Avon plant, now standing in the "List" as *S. procumbens*, var. *Druceana* F. N. Williams, on which the last word has not been said].

August 10, 1900.—Salmon and I have been in Norfolk for a fortnight. *Liparis* in two places, thousands of *Lastrea cristata*, *L. uliginosa* very sparingly, acres of *Lychnothamnus stelliger*. *Naias* is now protected—it is in two stations. *Senecio palustris*—at neither of the stations are there any specimens. A rascal three years ago took 20-40 roots in full flower; if he tries again he will have a warm welcome. . . .

We saw a lot of interesting things—*Daphne Mezereum* in beautiful fruit, and the caterpillars of the Swallow-tail were abundant.

September 15, 1909.—Many thanks for your kind letter with enclosure [this was the amount the members gave in answer to my appeal], only this idea of a Testimonial makes it exceedingly difficult to reply to your letter. I do not see what I have done to deserve it. Only what dozens of others have done . . . but don't think I do not feel deeply the kindness, for I do. Trouble and worry take the grit out of me.

PAPERS IN SCOTTISH NATURALIST.

1885.—*Carex salina*, found by Grant beside the Wick River, p. 26. *Calamagrostis lanceolata* sent by J. McAndrew from Kenmore Holms, Kirkcudbright, and *Allium carinatum* from Kirkcudbright coast, opposite St Mary Isle, by Mr F. R. Coles, p. 26. Plants of Iceland and the Faroes not known as British, pp. 65 and 116. *Carex salina*, var. *kattegatensis*, sent by Grant in 1883, first named by Bennett *C. paludosa*, var. *Kochiana*, afterwards corrected to above, p. 68. New Scottish Flowering Plants, p. 180. Include *Calamagrostis strigosa* (this was so named by Mr N. E. Brown, but Hackel referred it to a form of *C. stricta* and Druce names it *scotica*) and *C. elongata* from J. McAndrew from Kenmore Holmes, Kirkcudbright.

1886.—Forms of *Carex* New to Scotland, p. 268. Include *C. rigida*, var. *inferalpina* Laest. from the Little Culrannoch, F. J. Hanbury; *C. aquatilis*, var. *cuspidata* Laest., Wick River, var. *epigeios* Laest. and var. *virescens* And. (the two last sent by F. B. White from Perthshire), and *C. helvola* Blytt, found by Balfour on Lochnagar in 1846, and named by him *C. curta*, var. *alpicola*. Additional Records of Plants from Scotland, pp. 279, 309. These are plants either recorded by their finders or sent to Bennett. It may be said that he never visited Scotland. *Cerastium latifolium* auct. ang., p. 351. Bennett suggests that it is *arcticum* Lange, but it is the *C. nigrescens* Edmondst.

1887.—Additional Records of Scotch Plants for the year 1886, p. 56. Suggests that *Ranunculus Confervoides* from Angus is wrongly named. Notes on *Nuphar pumilum* and *intermedium*, as named by Dr Caspary, p. 106. The Ellesmere, Salop; Loch Kinnord, Aberdeen; and Loch in Aviemore plants are *pumilum*. The plant from Sanquhar, Dumfries, is named *luteum* × *pumilum* = *intermedium* by Dr Caspary.

1888.—*Arabis alpina*, found by Mr Hart, in Skye, p. 181. See *Journ. Bot.*, 247, 1887. *Juncus tenuis* found in Kirkcudbright by J. McAndrew, p. 181. Additional Records of Scottish Plants for the year 1887, p. 247. A very large proportion had been already recorded in the "Report of the Botanical Record Club" by myself. Contributions towards a Flora of Caithness, a joint paper with J. F. Grant, pp. 305, 357.

1889.—Flora of Caithness continued, pp. 39, 77. His *Orchis latifolia* is mostly *praetermissa*, its hybrids and varieties. *Festuca duriuscula* is said to be frequent, but this is not probable. *Nitella batrachosperma*, found near Obbe, in Harris, by Mr Duncan, p. 191.

1890.—Records of Scottish Plants for 1889, p. 263.

1891.—Records of Scottish Plants for 1890, pp. 85, 137, and 185.

PAPERS IN ANNALS OF SCOTTISH NATURAL HISTORY.

1892.—Contributions towards a Flora of the Outer Hebrides, from plants found mainly by Duncan and Somerville, p. 56. Records of Scottish Plants, p. 119. *Linaria minor* on Railway Banks, p. 204. Flora of Caithness (continued), p. 247.

1893.—*Ranunculus petiolaris* Marshall, sent by S. M. Macvicar from Moidart, with *Subularia*, p. 52. *Caltha palustris* and its forms, p. 52. Records of Scottish Plants for 1892, p. 95. Include *Orobanche cruenta* from Argyle, but the plant is not correctly identified. Notes on *Alchemilla alpina* and *A. conjuncta*, p. 122. Flora of East Sutherland, p. 225. *Juniperus intermedia*, found by Duncan in the Isle of Scarp, p. 250.

1894.—Flora of East Sutherland (continued), p. 25. Records of Scottish Plants for 1893, p. 158. *Chrysosplenium oppositifolium* in the Outer Hebrides, found by Duncan, p. 186. *Linnaea borealis*, found by Dr Joass in E. Sutherland, p. 186.

1895.—Records of Scottish Plants for 1894, p. 114. Flora of the Outer Hebrides (continued), p. 240. *Carex fusca*, found in Arisaig by W. F. Miller, p. 247.

1896.—*Elatine hexandra* in Glen Laxadale, N. Harris, with *Subularia*, found by Duncan, p. 63. Notes on London Catalogue, p. 107. Records of Scottish Plants for 1895, p. 113. Notes on Scott-Elliot's "Flora of Dumfriesshire," p. 246.

1897.—*Juncus tenuis* in Westerness, found by Grant, p. 32. *Lathyrus palustris*—no specimens from Scotland in Mackay's Herbarium, p. 51. *Carex magellanica*—corrects Dr Shoolbred's record of this from Harris; the specimen being *limosa*, p. 188. Records of Scottish Plants for 1896, p. 246.

1898.—Records of Scottish Plants for 1897, p. 225.

1899.—Records of Scottish Plants for 1898, p. 92. *Atriplex calotheca* is not correctly identified, p. 119. Scottish forms of *Juncus*, p. 119. *Carex curta*, var. *dubia*, p. 187. *Hierochloe borealis*, found by Miss Mittelbach in Kirkcudbright, p. 230.

1900.—Flora of Caithness (continued), p. 108. Records of Scottish Plants for 1899, p. 159. Euphrasias from Stroma, p. 187.

1901.—Records of Scottish Plants for 1900, p. 100. Notes on West Ross Plants, p. 107. *Sagina caespitosa*, p. 242. *Peucedanum palustre* in Scotland, p. 243.

1902.—Records of Scottish Plants for 1901, pp. 32 and 102.

1903.—*Equisetum hyemale* in Westerness, p. 47. *Utricularia ochroleuca*, p. 123.

1904.—*Juncus trifidus* in North Harris, gathered by Duncan, p. 195. Flora of Caithness (continued), p. 224. *Ajuga pyramidalis* as a Scottish species, p. 240. *Vaccinium intermedium*, found by Mr A. Sutherland at Scarmclet (not Sconilett) Braes, Caithness, p. 249. *Carex riparia* in Caithness, found by Mr Doull, p. 250.

1905.—Flora of Caithness (continued), p. 36. *Anthoxanthum Puelii*, from summit of Ben Aan, gathered by Gardiner in 1844, identified by F. Townsend (but it should be checked), and is not probable, p. 58. *Potamogeton falcatus* in Ardblair Loch, E. Perth, A. Sturrock, p. 123. Flora of Outer Hebrides (continued), p. 164. Records of Scottish Plants, p. 235.

1906.—*Lamium purpureum*, var. *decipiens*, p. 119. *Alchemilla alpina* and *conjuncta*, p. 121. Additional Scottish Records, p. 170.

1907.—*Butomus umbellatus*, found by Mr Bain on the north side of the Wick River a good many years ago (the specimen proved to be *Alisma Plantago*), p. 103. *Potamogeton undulatus* Wolfg., Kildean, River Forth, near Stirling, found by Mr Kidston (as *praelongus*), 1894, = *praelongus* × *crispus*, p. 104. × *P. Macvicarii* Ar. Benn. (*praelongus* ×*polygonifolius*). Loch-na-Craig-dhui, Ardnamurchan, and Loch Dow, Moidart. The first loch discharges its waters by the Allt Eas-an-Taileia into Kentra Bay. Found by Macvicar, p. 106. The Plants of the Flannan Isles found by Eagle Clarke, p. 187.

1908.—*Juncus balticus*, p. 36. *Calamagrostis strigosa*, p. 124. The plant is not caespitose nor is it *strigosa*. Additions to the Flora of Orkney, from specimens gathered by Mr M. Spence, p. 169. Records of Scottish Plants, p. 251.

1909.—Plants of the Faroe Isles, not occurring in Britain, p. 36. *Nasturtium palustre* in Orkney, ex Mr M. Spence, p. 53. *Crithmum maritimum*, found by Gibson on Mangursta Cliff near Stornoway, p. 55. *Limosella*, sent by Watt from a dam at Duntocher, nine miles from Glasgow, p. 55. *Carex atrofusca* in Perthshire, p. 55. *Saxifraga caespitosa* in Scotland, p. 174.

1910.—Notes on the Review of Kükenthal's *Carex*, p. 111. This is not a satisfactory paper. Flora of the Outer Hebrides (continued), pp. 165, 229. His *U. Bremii* is not correctly named. Mr Duncan supplies a valuable note on the Scarp Orchids, but his *latifolia* is *praetermissa* and its forms and hybrids. Flora of Caithness (continued), p. 225. *Carex aquatilis*, var. *rigida* nov. var., from the banks of the Nith, Sanquhar, Dumfries, Dr Davidson, and Kenmore Holms, New Galloway, J. McAndrew, p. 236. *Alisma Plantago* in Caithness, p. 252. This is the plant recorded in error as *Butomus* on p. 103, 1907.

1911.—Flora of Caithness (continued), p. 44. *Vicia Orobus*, p. 104, a gracile form at Dalmeny. *Vicia sylvatica*, var. *condensata* Druce, in Kincardine, gathered by A. Somerville on shore-rubble north of Johnshaven. A remarkable form of *Carex aquatilis* found by George West in Inchnacardoch Bay, Loch Ness, a rhizome weighed 70 pounds, p. 121. Notes on *Callitriche*, p. 121. Notes on the Genus *Potamogeton* of "The London Catalogue," ed. 10, p. 180. The var. *Richardsonii* of *perfoliatus* from a mill-dam, Selkirk, is wrongly identified. *Pyrola uniflora* from Bernera in Hb. Smith, gathered in 1783 by James Hogg, p. 185. *Valeriana dioica* in the Isle of Scarp, found by Duncan, p. 186. Distribution of *Goodyera repens*, p. 242. *Hierochloe*, p. 252. *Stellaria palustris*, p. 253.

PAPERS IN SCOTTISH BOTANICAL REVIEW, 1912.

Aquatic Forms and Species of the British Flora, p. 17. *Carex helvola*, p. 41. *Potamogeton praelongus* from Orkney, sent by Mr Spence, p. 47. *Juncus alpinus*. Notes on Mr West's record from the sandy bays of Loch Grennoch, by Cairnsmore of Fleet, at 690 feet above sea-level, p. 47. Scottish Forms of *Sparganium*, p. 94. Recent Additions to Caithness Flora, p. 181. *Saxifraga Hirculus*, Caithness, found by G. Lillie in a floating bog between Lybster and Loch Rhuard, alt. 430 feet, about 1½ miles from the Loch, p. 205. *S. Aizoides* in Orkney, sent by M. Spence, p. 235. *Utricularia vulgaris* from Loch Watten, Caithness, specimens gathered by Mr Lillie, p. 235. The plants, however, were flowerless.

COULTER, JOHN MERLE. Born at Ningpo, China, on November 20, 1851; died at Yonkers, New York, December 23, 1928. Appointed Professor of Botany at Chicago, 1896, he was really a great teacher. For 50 years he edited the "Botanical Gazette" with C. J. Chamberlain. His text-books on the Morphology of Angiosperms and Gymnosperms were deservedly popular. Many of his Rocky Mountain plants are at Oxford. He was the friend and pupil of Asa Gray, and with Watson produced the sixth edition of Asa Gray's "Manual." With J. N. Rose (recently also lost to us), he issued in 1900 the "Synopsis of the Mexican and Central American Umbelliferae." He had a full share of honours, and deserved them all. See *Trans. Linn. Soc.*, 141, 1929.

ELLMAN, Rev. E. Born at Berwick, Suffolk, 1854; died at Bath, January 30, 1929. He was educated at St John's College, Oxford, was ordained, and did clerical work in Cornwall, Kent and Sussex, to which counties he added much botanical knowledge. Always in delicate health, in later years he greatly suffered from asthma. While at Oxford he discovered *Sonchus palustris*. Subsequently I went with him to corroborate the find, but he was unable to locate the place. Years after it was found by the Rev. H. J. Riddelsdell, and then I saw how Ellman had mistaken the path. When we were within 150 yards of it he had taken a wrong direction. He was a curious type, shy, and so hating publicity that he never published the results of any of his work, though he had explored very largely in the South of Europe and North Africa, M. Emile Jahandiez being a frequent companion. He also accompanied White and Bucknall in a South European tour. In more recent times Noel Sandwith accompanied him on his last visit to Cabo de Gata, S.E. of Almeria, Alicante, Denia, etc. His 3000 gatherings, made in Spain, Pyrenees, and Switzerland have been given to Kew. He was entirely careless of his personal appearance. The clothes he wore were sometimes and something disreputable, but he was a gentleman underneath the uncleanly garb. His cheeriness and kindliness were pass-words to a brotherliness which stood him in good stead in his wanderings. On these Spanish journeys, C. E. Hubbard and N. E. Sandwith published in his honour in Kew Bulletin, 150, 1928, *Teucrium Ellmanii* from limestone moun-

tains near the sea west of Almeria, and *Juncus Ellmanii* from moist places on slopes of the Cerro de los Avantos at 1350 m. and from other places. The rush had previously been confused with *J. squarrosus*.

FORTESCUE, EMILY ORMSBY GORE, COUNTESS FORTESCUE. Born 1859; died at Castle Hill, Devon, 1929. She married in 1886 Lord Ebrington, who was then Master of the Devon and Somerset Staghounds. There, in Devon, her great charm made her very popular. When, in 1904, her husband became Lord-Lieutenant of Devon, she at once began a great work of social service. She founded in that year the Devon Nursing Association, and under her wise supervision, it may now be said that in all the large area of that glorious county she has made it still more splendid by providing that hardly a child is born without the ministrations of skilled nurses. In 1905 her husband succeeded to the Earldom, and that step still further added to her responsibilities. So in 1907, while he carried out Mr Haldane's scheme for the Territorial Forces, Lady Fortescue started the Devon branch of the Red Cross Society and other work. In 1913, Queen Mary appointed her to be a Lady of the Bedchamber, and at Court she was not only very popular but very useful, her knowledge of German standing her in good stead. About this time—she was always interested in Botany—she introduced me to the instructress of H.R.H. Princess Mary, M. Dussan, and several excursions were made in the neighbourhood of Windsor. At that time the Princess was interested in wild flowers and, if I remember rightly, found *Galinsoga* in the gardens of Buckingham Palace. I was also able to show Lady Fortescue the rarities of the Jersey Flora, including *Orchis laxiflora*. At their beautiful house of Castle Hill, where I made the acquaintance of Mr Trethewy, Braunton Burrows was explored, and Lady Fortescue showed me several stations for *Geranium versicolor*, as well as *Cochlearia* in inland situations. We drove to Lady Stukeley's delightful garden near Clovelly, and saw masses of *Scilla verna* and the naturalised *Libertia formosa*. Then I had the pleasure of showing her masses of *Lilium pyrenaicum* at Mollond. Lady Fortescue's early days were spent at Chilton in Buckinghamshire, which commands a very fine view of the vale of Aylesbury, so there was another bond of interest. Her work during the war was splendid, and she had the joy of seeing both her sons back unscathed. In 1922, when driving in a pony carriage, she was upset and thrown upon her head, but with her boundless courage she made light of her injury. However, she never was the same again, and had to give up the Court appointment. Her after years were a constant battle against bodily pain.

GOULDING, RICHARD WILLIAM. Born at Louth, Lincolnshire, November 23, 1868; died there, November 9, 1929. Our member was Librarian and Private Secretary at Welbeck Abbey, a distinguished antiquary, and the author of authoritative works on portraits, miniatures, historic manuscripts, mediaeval local history, obscure biography, and kindred subjects. His life was one of profound and continuous labour, and

while his botanical activities cannot be described as leisure time pursuits, they certainly tended to brighten the occasional hours of freedom which he allowed himself. In the early eighties, while at Louth Grammar School, he made collections of Lepidoptera and Coleoptera. By so doing he not only obtained two of the prizes which were then awarded for such collections but acquired interests in natural history which endured to the end. Before long these interests included botany, and that his delights in the wild-flowers and later in the adventive plants which at Welbeck sprang up in quantity were equally enduring is evident from our Reports (1928 included), which have contained many records of his gatherings. Among his numerous pamphlets are memoirs of Martin Lister (whom *Listera* commemorates) and of Sir Richard Kaye (whose note-books in the British Museum were found to contain lists of plants observed by him at Welbeck in 1777 and Kirkby in 1774), a notable person, as Dr Druce said, whose acquaintance with botany was practically unknown to most of us. In other pamphlets Goulding wrote of early Louth botanists:—(1) John Bogg (b. 1799), who was "so far as we know the first native of Louth who made a collection of the wild-flowers of the district;" (2) Thomas Wemyss Bogg, who supplied H. C. Watson with a "London Catalogue" checked for plants seen within ten miles of the town; (3) John Theodore Barker, author of "The Beauty of Flowers in Field and Wood," whose Louth classes during the fifties made botanists of the grandfathers of the present generation. Of the Lincolnshire Naturalists' Union and of the Louth Antiquarian, Naturalists' and Literary Society, Goulding was among the founders, the Louth Society having been instituted in 1884 by him and four other boys. He diligently served the Union and the Society as one of the joint Secretaries during more than thirty years, and with equal diligence he continuously placed both time and ability at the disposal of others. Of his gentle, considerate, and unchanging personality, it must suffice to say that he inspired both esteem and admiration, that he was deeply loved, and that he was capable in the highest degree of close and lasting friendship.—H. W. KEW.

One cannot refrain from adding an expression of great regret at the loss of so esteemed a member, and of so kindly and frequent a correspondent. He had a quick eye for spotting a variant, and many plants were added to his area by his industrious zeal. The "Louth and Lincolnshire Advertiser" had a long tribute to his memory, and more than a third of a column of a list of his published works. These chiefly related to local county history. In late years he had been the valued private secretary to the Duke of Portland, who was one of the many people who attended his funeral. In his researches into the documents at Welbeck, he came upon a pamphlet autographed by Elia—Charles Lamb. Quite recently he was elected a Fellow of the Society of Antiquaries.

A recent letter is appended:—Dear Dr Druce—I congratulate you most heartily on the new issue of your *Report*. As far as I can judge from a mere hasty glance it seems to me better than ever, and the section on the descriptions and illustrations of the Rubi is quite remark-

able and valuable. All who are interested in Wild Flowers are greatly in your debt.

A correspondent of "The Times" writes:—Mr Richard Goulding, whose death has been briefly noticed in "The Times," was librarian and private secretary to the Duke of Portland, and deserves more than a passing reference. He contributed to the eighth volume of the Walpole Society (1919-20) a long and exhaustive paper, elaborately illustrated, on "Wriothesley Portraits," a work to which he must have devoted many years. The essay is in every way admirable, is full of historical knowledge and permeated with judicial critical acumen concerning the portraits discussed. The essay was the outcome of his study of certain portraits at Welbeck that were formerly at Titchfield House, the family mansion of the Duke's ancestors, the Wriothesleys, Earls of Southampton. The monograph has a much greater than a family interest, seeing that it includes the third Earl of Southampton, who, in Macaulay's words, was "that accomplished nobleman, who will be remembered to the latest ages as the generous and discerning patron of Shakespeare."

HARSHBERGER, JOHN W., Ph.D. Born in Philadelphia, January 1869; died 1929. In September 1888, he entered the University at Philadelphia, graduating B.Sc. in 1890. He began a herbarium when he was seven. He became a successful lecturer and a ready helper in any educational work, and had through his hands many of the leading botanists of America. His chief work was "Phytogeographic Survey of North America"—including Mexico, Central America, and the West Indies, together with the Evolution of North American Plant Distribution, a book of 790 pages. He was made an Honorary Member of Societas for Fauna et Flora Fennica in 1923. His Life and Work, an autobiography, appeared in 1928.

HARVEY-GIBSON, Prof. R. J. Born in 1860; died in June 1929. Educated at Aberdeen as a pupil of Professor Trail, Edinburgh and Strasburg, in 1883 he was made demonstrator in biology in the old school of Medicine at Liverpool, which was later amalgamated with University College, and became the foundation of the present University. His energy in this work led to an establishment of a Department of Botany in 1889, his first assistant being Dr A. J. Hewart. Through the generosity of Mr Holebrook Gaskell, a chair of Botany was founded, and Harvey-Gibson was its first holder. He contributed to the "Annals of Botany" papers on the anatomy of the genus *Selaginella*. For a short time he was a colleague of mine as an examiner in Botany of the Pharmaceutical Society. Among his pupils at Liverpool was Dr J. C. Willis. His chief works of interest to us are the completion of Reynolds Green's "History of Botany" (see *Rep. B.E.C.*, 46, 1914), and his "Outlines of the History of Botany," which I reviewed in *Rep. B.E.C.*, 594, 1919. In it he sharply reproves Sachs for his unfair treatment of Theophrastus, and for his statement that Linnaeus showed an utter incapacity of careful observation of any object difficult to observe. Harvey-Gibson defends

Lindley against the savage expression of Sachs "that his Vegetable Kingdom is one of the most unfortunate classifications ever attempted." He had no hesitation in prophesying that in years to come botanists will regard Engler's system as having done as much to retard the true phylogenetic classification of Angiosperms as Linnaeus' sexual system retarded a natural classification. During the war he served as Colonel in the Territorial Army, was made C.B.E. in 1919, and was a D.L. and J.P. for the County Palatine.

BUCHAN-HEPBURN, Sir ARCHIBALD, of Smeaton-Hepburn, Co. Haddington, East Lothian. Born 1852; died 1929, after an operation, at the age of 77. The second son of the third Baronet, he was educated at Glenalmond and Trinity College, Cambridge, and was called to the bar by the Inner Temple in 1877, joining the South-eastern Circuit. He succeeded his father in 1883, his elder brother having been killed by a party of miners in Mexico ten years before. Sir Archibald was a J.P. and Deputy-Lieutenant for Co. Haddington, and Chairman of the County Council. His wife died in 1923, and he is survived by two sons, of whom the elder, John Karslake Buchan-Hepburn, succeeds to the Baronetcy, and one daughter. The eldest son, Captain T. E. A. Buchan-Hepburn, died in 1923. He grew the magnificent *Orchis foliosa* of Madeira in his garden, and this hybridised with the showy hybrid, *O. maculata* × (*latifolia*) *praetermissa*, which I named (*Rep. B.E.C.*, 211, 1915) as ×*O. Hepburnii*.

JHALAWAR, THE MAHARAJAH RANA. Born 1874; died April 13, 1929. Educated at Mayo College, Almore, he first visited Europe in 1912. One day, as I was coming out of the Botanic Garden, I saw a couple of Indians looking at the old Gateway. They asked some questions and it resulted in my showing them the treasures of the Library—the wonderful paintings of Bauer for the "Flora Graeca," the historic copy of Dioscorides, the Hortus Siccus of Gregory of Reggio, and the plants sent back to Du Bois from India in 1690. It was not till we were coming away that I found that the Indian was the Raj Rana of Jhalawar. He had been most intelligently interested in our historic relics. Thus began—allowing for the difference in our social position—an acquaintance which ripened into a real friendship. I went up to his great fete in London, when it was a little embarrassing, in saying good-bye, to have one's pocket-handkerchief sprinkled with otto of roses. An illness prevented my going out to Rajputana for the winter as His Highness's guest. That year he visited Cambridge where he was entertained at Newnham. He became a Life Member of our Society, but it was mainly the exact sciences that interested him—meteorology, aeronautics and education being his favourite subjects. At the British Association Meeting at Cardiff, His Highness was a prominent feature, and we had much conversation about his son, whom I strongly recommended should come to Oxford. In 1920 the Maharajah came to Oxford and took a house near to me, where his son, Prince Kumar Rajendra Singh, also lived.

His heir had recently married the daughter of the Maharajah of Vizianagram, and he joined Christ Church while the Maharajah himself went as a research student into New College. He was greatly interested in general literature, in the arts and drama. He had the good fortune to become a grandfather during his residence, a son being born to his son, Prince Kumar—I suppose a unique instance of the heir to an Indian Prince being born in Britain. I remember being present on the State occasion of the tiny child being shown, the half-frightened, but wholly proud little Princess, his mother, being present on that occasion. About that period, I gave a luncheon to the City Council on my relinquishing the chairmanship of the Sanitary Committee after a quarter of a century's service. As the Maharajah had a long settled engagement for that day, he was not present, but sent Prince Kumar to represent him. At that time there was a little pressure put upon him to study botany but, beyond purchasing a drying press, I am afraid the flowers of the field did not suffer from his efforts. The Maharajah was extremely kind and helped in many projects. His own State is a witness to that. There, among other things, he built a Public Library (his own was a singularly good one), Schools and Literary Institutes, and his death at so early an age, which occurred on s.s. Ranpura, two hours after the ship left Bombay, is a great loss to his State and to Britain.

MELVILL, Dr JAMES COSMO. Born July 1, 1845; died at Meole Brace Hall, Shrewsbury, November 4, 1929. He was the son of James Cosmo Melvill, Under Secretary of State for India, and grandson of Sir James Cosmo Melvill, F.R.S., chief Secretary of the East India Company. Educated at Harrow, to which he has given a British Herbarium, in 1864, in conjunction with Hon. F. C. and G. O. M. Bridgman, he prepared a "Flora of Harrow." A second edition, edited by the Rev. William Hind, appeared in 1897. On leaving Cambridge he entered the business of his uncle, Edward Hardcastle, and travelled much in North America. Later he joined the firm of Messrs G. & B. Dewhurst, East India merchants, of Manchester and Preston. In 1874 he married Bertha, daughter of Mr G. C. Dewhurst of Lymm, Cheshire. He leaves one son and four daughters, but he lost his eldest son in 1920.

Melvill began his scientific career at an early age by forming a collection of shells when he was eight years old. To this collection he went on adding until it reached over 22,500 in number. He is said to have described about 1000 new species. He had held the office of President of the Conchological Society, and at the time of his death he was President of the Meteorological Society. He was necessarily brought into contact with our late Secretary, Mr Charles Bailey, at Manchester, and a friendly rivalry in obtaining collections existed, but they had one common object—that of enriching the Victoria College of Manchester. They therefore bifurcated their purchases of exsiccata, Melvill taking the extra European, while Bailey went in for the European. This resulted in the magnificent gift to Manchester of 225,000 sheets by Melvill. This, we are told, will be supplemented by his very large col-

lection of grasses and ferns. He had also a very fine collection of Lepidoptera and British insects.

When Lord Morley conferred on him the degree of D.Sc., Professor Lamb said:—" It is chronicled of Solomon that he spake of trees from the Cedar that is in Lebanon, unto the Hyssop that springeth out of the wall, but it is not recorded that he also knew by heart all the shells of the ocean from the Arctic Circle to the Persian Gulf. That double weight of learning was reserved for the accomplished systematist, Mr Cosmo Melvill, and those who know him will ratify with what gracious modesty he sustains it." He was also an F.L.S., F.G.S., and F.Z.S.

Melvill was one of our oldest members, having joined us in 1877. He was a fairly regular contributor to the Club, having sent in over 2000 specimens. At frequent intervals he wrote to the " Journal of *Botany*: 1875—Notes on the Marine Algae of South Carolina and Florida, 127 species being enumerated. 1880—*Bromus maximus* from Jersey, and several forms of *Silene gallica*. 1882—*Rubus spectabilis* in Kent; *Dentaria bulbifera* in Kent and Sussex; Flora of Kersal Moor, where 240 species are enumerated. 1883—*Arum italicum* in Kent, from the Undercliff at Folkestone. 1884—*Hieracium argenteum* in Montgomeryshire. 1887—*Agropyron violaceum* in Perthshire. 1888—*Arum italicum* in Kent. 1889—New Scottish Records; the *Rumex aquaticus* recorded is *R. longifolius*. 1891—Notes on the Flora of the Faroes; about 80 species are noted. 1892—*Trachelium caeruleum* in Guernsey, a new adventive to the British Isles, evidently a garden escape; Species of Strathearn Hieracia, 22 are noted. 1898—*Sisymbrium strictissimum* in Lancashire and Cheshire. 1899—*Chenopodium capitatum* in Carnarvonshire. He was a Member and President of the Literary and Philosophical Society of Manchester, and on November 4, 1878, he gave a list of over 300 species noticed on the Breidden Hills, when he thought he had found a new variety of *Arabis hirsuta*. *Potentilla rupestris* was in existence at that time. His best discovery, or rather rediscovery, was one of George Don's plants—*Triticum alpinum* Don MS., the *T. caninum*, var. *biflorum* Syme, E. B., xi., 177. This is in my own herbarium and in that of Borrer's at Kew. The plants were gathered on Ben Lawers. Buchanan White (*Scot. Nat.*, 326, 1886) named the grass *Agropyron repens*, var. *Donianum* F. B. White (as species) in Perth. Soc. Nat. Sc., xli., 1882, under which name it stands as a species in our " List," but I have little doubt that it is *A. violaceum* Hornem. Mr Mitten (Hooker *Lond. Journ. Bot.*, vii., 533, 1845) brought it to notice as *Triticum biflorum*, but Dr Buchanan White (*Scot. Nat.*, 232, 1890) says that the paleae of the two plants differ. In *Donianum* the ribs form short lateral awns, small and rudimentary at an early stage, becoming conspicuous as the fruit matures; in *violaceum* no trace of the lateral awn appears. Mr Melvill found it on rock-ledges of Ben Lawers, c. 3000 feet, in July 1878 (*Journ. Bot.*, 57, 1887), and recognised that it conformed in every particular with *violaceum*. I believe Melvill and Hanbury afterwards found a single plant above Loch-na-Chat, which they divided. I saw specimens growing in Mr Hanbury's

garden and also in Buchanan White's garden in Perth. Dr White also found it in 1888 (see *Trans. Bot. Soc. Edin.*, 260), " as a stout tuft on a rock ledge."

Melvill and I had been correspondents for half a century, but once only had I the pleasure of meeting him in Oxford. At one time he told me he had an idea of writing a new Salop Flora, but that has not matured. It would be a goodly monument to his memory.

PAUL, Rev. DAVID, D.D. 1845-1929. It is with great regret that we hear of the death of the Very Rev. David Paul, D.D., of the Grange Church, Edinburgh. Before being called to that charge, he had been Minister successively at Morebattle and Roxburgh, where, among the border hills, he had every opportunity of indulging his bent for Botany in connection with the Berwickshire Naturalists' Club—the earliest Field Club in England—of which he was in due course President. Somewhat later in life he joined the Edinburgh Botanical Society and became also a member of its offshoot—the Scottish Alpine Botanical Club. While on one of that Club's annual excursions he rediscovered on Ben Lawers *Carex ustulata*, originally reported by Don from the same range. Dr Paul also went, in the interests of the Church, to Guiana and the West Indies, and so was enabled to get a glimpse of the plants of the New World. But it is as a Fungologist that he will always be chiefly remembered, for on Fungi he was one of the very greatest authorities, and the chief expert on them in Scotland, if not in Great Britain. He was a well known Horticulturist and grew many rare plants at Roxburgh where the soil is peculiarly adapted for their cultivation, and where the climate is suitable.—A. H. EVANS.

It may be added that he served for some years as Foreign Secretary of the Botanical Society of Edinburgh, of which he was President, 1899-1901.

ROBERTS, ALEXANDER FOWLER, of Fairnilee. Born 1844; died May 13, 1929. The son of the late Provost of Selkirk, he was educated there and at the Edinburgh Institution and Academy and at Cheltenham. He entered the business of Messrs G. Robertson & Co., Woollen Manufacturers, and became partner and managing director. He became Provost of Selkirk. In his term of office the Victoria Hall was built, and much of its beauty was due to him, and to it he was a liberal contributor. He was a member of the County Council and Chairman of the Selkirk School Board. Endowed with great riches he became a judicious art-collector, and made his home and its surroundings very attractive. In one of the hedges of his estate, Miss Hayward and I found a beautiful yellow rose, of which neither the name nor the history has been quite satisfactorily settled. I also found *Fumaria pallidiflora* in his garden. He was one of our life members.

SALMON, CHARLES EDGAR. 1872-1930. Died suddenly at Reigate on New Year's Day, 1930. By profession he was an architect, a member

of the Royal Institute of British Architects and of the Architectural Association. Formerly he had practised in London, but for the last twenty years had confined himself to domestic architecture in Reigate and neighbourhood. He was keenly interested in local history and antiquities, and possessed a valuable collection of old maps and plans. For many years past he had been Secretary and had taken a leading part in the activities of the Reigate and Redhill Open Spaces and Footpaths Protection Society through which has been secured or saved for the nation some of the best ground in that lovely neighbourhood. His critical work on the British Flora is well known to our members and much of it is recorded in the "Journal of Botany" and in the annual "Reports of the Exchange Clubs." In 1902 he was elected a Fellow of the Linnean Society and served on the Council from 1920 to 1923. From 1911 he had been one of the referees to the Watson Club; and he gave freely of his time and knowledge to the local Holmesdale Natural History Club of which he was President last year, the South London Botanical Institute, of which he had been a fellow since 1913, and the Botanical Section of the South-Eastern Union of Scientific Societies, of which he was President in 1928. The eleventh edition of the London Catalogue, with the exception of certain genera, owes its value to his work, in the course of which he traced to its source almost every name included; and the second Supplement to Topographical Botany now appearing in the "Journal of Botany" he prepared in collaboration with the late Arthur Bennett and Prof. Matthews. But the chief work on which he had expended much of his time for many years past is still unpublished. The Flora of Surrey is already in type for a considerable part, and its completion from his manuscript and notes is eagerly anticipated by all interested in British botany. His large and important herbarium, which includes the herbarium of the late Arthur Bennett, has been bequeathed to the British Museum.

In the course of a friendship extending over many years the present writer learnt to appreciate the charm and guileless simplicity of his personality. His transparent honesty of thought, strong common-sense and equable temperament kept him above any form of meanness or selfishness; personal ambition did not touch him and he desired nothing at the cost of others; his happy disposition was entirely free from bitterness, and I never heard him make a remark which could give pain. He had a keen sense of humour and a ready sympathy that made him a delightful companion whether on a botanical expedition or a short visit or even a meal in common. His enthusiasm for natural beauty ranged equally from enjoyment of a glorious view to intense delight in the perfection of tiny things. Indeed his botanical interests were directed to some extent by his interest in small or minute characters, and he has left his mark on the study of certain genera in which such characters have special diagnostic value. Nothing seemed to escape his notice and his critical opinion was reliable precisely because he took so little for granted. Only his intimate friends knew what a fund of exact and detailed knowledge lay behind his comments; even a short

note or confirmation of a naming was the result of a thorough examination and reference to authorities, supported by comparison with specimens in his own extensive herbarium. His methods were excellent, his judgment clear and unbiassed, and nothing slipshod or insincere ever came from his pen.

A list of his principal botanical papers is given in the "Journal of Botany," February 1930.—W. C. BARTON.

SCOTT, VICTORIA HENDERINA (Mrs D. H. Scott), née Klaassen. Died suddenly at Oakley, Hants, January 18, 1929. She was elected F.L.S. in February 1905, and became a frequent attender at the meetings of the Linnean Society, the British Association, and the South-Eastern Union of Scientific Societies, where her kindly and genial personality made her most welcome. In 1911, at the Linnean Society, she gave a lantern exhibition of a new species of the fossil genus, *Traquaria*. She wrote several papers on fossil botany. Her help is witnessed to by Dr D. H. Scott in the Annals of Botany for 1903 in his Studies of Fossil Botany and in his Introduction to Structural Botany. She also made a detailed study of the movements of the flowers of *Sparmannia africana*. See Trans. Linn. Soc., 147, 1929.

TRABUT, Dr LOUIS. Born 1853; died April 23, 1929. He was Professor of Natural History at the mixed School of Medicine and Pharmacy at Algiers. With his colleague, M. J. A. Battandier, he wrote a very comprehensive Flore de l'Algérie of that interesting area, and published a memorable account of La Tlaia, *Tamarix orbiculata* Vahl, with full details of its history and its insect pests. He showed (*Journ. Roy. Hort. Soc.*, 250, 1900) that the species of Eucalyptus which have been so extensively planted in Algeria and the Mediterranean regions produce natural hybrids.

TROWER, ALICE. Born 1853; died July 1929. Alice, the surviving and elder sister of our member, Miss C. G. Trower, whose memoir appeared in our *Report* for 1928, died without suffering in July last, and thus Stansteadbury, their beautiful old-world home for over 70 years, remains tenantless. As one said in the short memoir of Charlotte (*Rep. B.E.C.*, 851, 1928), they were the daughters of Captain Edward Trower, and of their mother, who was one of the Guernsey Gosselins, a botanical family. Their brother lived with them for many years until his death. Charlotte's paintings of wild flowers were exceptionally good, and won three of the Grenfell Medals at the Royal Horticultural Society, and in her memory the Brambles were reproduced in our last *Report*. They are as good as blocks can be. Alice, in her early days, painted landscapes, but later on confined herself to collecting British plants for her sister to paint, and thus she had a fair acquaintance with them. Her memory for places was tenacious, and she had a quick eye to detect varieties. They divided their more prosaic duties. Alice looked after the house and its details. She was a wonderful needle-woman. Did

not the sisters take out the ink-stained patch from my rose-pink Broussa Prayer-rug, and replace it in tint and texture like the original? Charlotte managed the estate and pedigree cattle, and both did a variety of work outside their domain in the mass of philanthropic Societies which are like the sands of the sea in multitude. Alice acted as organist for the church for over half-a-century. Sometime before her sister's death, Alice suffered much from heart attacks: indeed, on more than one occasion, it was thought she could not recover. Her sister's death was bravely born, and she walked to the service in the church which is close to the Park. On the return I took her home by a short cut, gave her a stimulant, and she went to bed, where I left her, even cheerful. She pulled herself together wonderfully, took up the household keys, and went on in the old way. But the gap left was too wide to be filled with mundane duties. She gradually weakened, and sank to rest, not through the fiery portals of pain, but from sheer weakness. Thus have passed away two most loving and lovable people—lovers of nature in the truest sense. Miss Alice Trower discovered *Lychnis Preslii* at Tantallon and, in her garden, seeds of it produced numerous offspring.

WAGER, Dr HAROLD. Born 1862; died November 17, 1929, buried at Arncliffe. In 1886 he was a student of the Royal College of Science, where he had the advantage of being under Dr D. H. Scott. In 1888 he was appointed demonstrator in biology in the Yorkshire College at Leeds, and with that town and with Yorkshire he has been connected ever since—adding to his associations by marrying Winifred, the daughter of Prof. L. C. Miall. During the war he took over the direction of the Department of Botany in the absence of Prof. J. H. Priestley. He presided over Section K at the South African Meeting of the British Association in 1905. On the occasion of the meeting of the Yorkshire Naturalists' Union in Leeds in 1914, the University of Leeds conferred upon him the D.Sc. He became a Fellow of the Royal Society in 1904, and President of the British Mycological Society in 1910. His publications include "Memoirs on the Cytology and Reproduction of the Lower Organisms," "Physiology of Plants," etc. In later years he severed his connection with academic work, and became a Staff Inspector of H.M. Secondary Schools, Board of Education.

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. Stansfield; *Rep. Marlb.=Report of the Marlborough College Natural History Society; R.I.C.=Journal of the Royal Institute of Cornwall; Rep. Winton.=Report of the Natural History Society of Winchester College;* †=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 Vice-county in *Topographical Botany*; [] enclosing a record mean that confirmatory evidence is needed.

We have to thank the Director of the Royal Botanic Gardens, Kew; Mr J. Fraser, Mr W. O. Howarth, Prof. C. H. Ostenfeld, Prof. O. E. Schulz, Dr Probst, Dr Ronniger, Dr J. Murr, Dr E. Almquist, M. Jaquet, Dr Aellen, Dr Drabble, Mrs Gregory, Mr C. E. Britton, Dr Dahlstedt, M. Patrice de Riencourt de Longpré, Col. A. H. Wolley-Dod, Mr I. A. Williams, Dr Zahn, Mr W. H. Pearsall, Mr H. W. Pugsley, Mr A. R. Horwood, Mr W. Watson, Mr D. Lumb, Mr C. V. Marquand, Rev. H. J. Riddelsdell, and others who have rendered critical assistance.

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†1/1. CLEMATIS VITALBA L. Balquhidder, West Perth, on old Kirk ruin, WEBB.

2/3. THALICTRUM MARINUM Druce. (DUNENSE). North Denes, E. Norfolk, E. A. ELLIS.

3/2. ANEMONE NEMOROSA L., var. CAERULEA DC. Copse on the old canal between Tonbridge and Penshurst, W. Kent, 1881, LITTLE. This corrects an erroneous record.

4/2. ADONIS AESTIVALIS L. Splott, Cardiff, Glamorgan, R. L. SMITH.

6/3. RANUNCULUS ACER L., var. MINUTIFLORUS Druce. Dr Parkin tells me about three per cent. of plants near Wigton, Cumberland, come under this form.

6/6. R. LINGUA L. The usual hairy form in Askham Bog, York, August 1929, DRUCE.

6/7. R. FLAMMULA L., var. ANGUSTIFOLIUS Wallr. Dunsford, S. Devon, Miss LARTER.

6/21. R. CIRCINATUS Sibth. Kenfig Pool, Glamorgan, Miss E. VACHELL.

6/24. R. HETEROPHYLLUS Weber, var. TRIFIDUS Pearsall. Wood Walton, Hunts, with carpels nearly glabrous, DRUCE, teste PEARSALL.

6/31. R. LENORMANDI F. Schultz. A form with peculiar leaves (possibly a hybrid), Burton Mere, S. Lancs, June 1928, HOLDER. Named by PEARSALL.

6/32. R. HEDERACEUS L. This is the *R. Lenormandi* of H. N. Dixon from Hazelbeech, Northants. See *Journ. Northants N.H.S.*

9/2. HELLEBORUS FOETIDUS L. Crawley Butts, Gower, Glamorgan, WEBB.

11/1. AQUILEGIA VULGARIS L., forma CAERULESCENS Dr. Found by Mrs THOMPSON in Stockton Wood, Wilts, June 1929. The plants were two feet high and had large flowers of a pale blue (*Myosotis*) colour.

†12/1. NIGELLA DAMASCENA L. Beaulieu, S. Hants, 1929, GRIERSON.

14/1. ACONITUM ANGLICUM Stapf. Wood near a stream near Burton-on-Trent, Derbyshire, Sir ROGER CURTIS.

†21/1. PAPAVER SOMNIFERUM L., var. LEPTOCAULATUM. Bassett, S. Hants, PACK, ex RAYNER. I know nothing of it.—DRUCE.

21/2. P. RHOEAS L., var. STRIGOSUM Boenn. Wymondley Road, Hitchin, Herts, LITTLE.
Var. TROWERIAE Dr. Walton, E. Suffolk, BEMROSE.

21/4. P. LECOQII Lamotte. Burton-on-Trent, Derby, DRUCE; Stevenage, Herts, stigmatic rays reduced to four, LITTLE.

22/1. MECONOPSIS CAMBRICA (L.) Vig. Woody Bay, N. Devon, October 1929, DRUCE.

†23/1. GLAUCIUM GLAUCIUM (L.) Karst. With varying tints of orange to scarlet, Burton-on-Trent, Staffs, DRUCE and CURTIS.

†28/1. ESCHSCHOLZIA DOUGLASII Walp. Burton-on-Trent, Staffs, 1929, DRUCE and CURTIS.

31/1. CAPNOIDES CLAVICULATA (L.) Dr. Growing over a fallen tree in a wood near Woodbridge, Suffolk, 1929, Miss D. NICHOLLS. Already recorded in the *Flora of Suffolk*.

32/4. FUMARIA PURPUREA Pugsl. Arnside, Westmorland; Fleckburgh, Lancs, MASON.

32/5. F. BORAEI Jord. Eastham, Cheshire, MASON; Hayle, Cornwall, DRUCE.
Var. GRACILIS Pugsl. Thornton Hough, Cheshire, MASON.

*32/6. F. MURALIS Sonder, var. DECIPIENS Pugsl. Boughrood, Radnor, September 1929, DRUCE.

32/9. F. BASTARDI Boreau. Walton, E. Suffolk, BEMROSE; Martin Mere, S. Lancs, HOLDER and WAGSTAFFE.
Var. HIBERNICA Pugsl. West Kirby, Cheshire, MASON.

32/10. F. OFFICINALIS L., var. WIRTGENI Hausskn. Shelford, Cambridge, MASON; Basildon, Berks, DRUCE.
Var. MINOR Koch. Burton-on-Trent, Staffs, DRUCE.

33/1. MATHIOLA INCANA Br. Alderney, 1929, ex Miss E. VACHELL.

†34/1. CHEIRANTHUS CHEIRI L. Clyro, Radnor, WEBB.

35/2. RADICULA SYLVESTRIS Dr. Beaulieu, S. Hants, very rare in the county, DRUCE; Southwick, Sussex, Mrs WEDGWOOD; Hale, S. Lancs, J. D. MASSEY.

35/4. R. ISLANDICA (Oeder) Dr., var. MICROCARPA (Beck) Britton. Thames-side, between Mortlake and Kew, Surrey, BRITTON.

36/4. BARBAREA ARCUATA Reichb. Burton-on-Trent, Staffs, DRUCE, teste Prof. O. E. SCHULZ as var.

†*37/1. ARABIS HIRSUTA Scop. A garden weed at Brough Lodge, Fetlar, JOHNSTON in *Trans. Bot. Soc. Edin.*

†37/12. A. CAUCASICA Willd. Heath sand-pits, Beds, 1929, DRUCE; on a wall, Stromness, Orkney, JOHNSTON.

39/3. CARDAMINE IMPATIENS L. Bramley, Surrey, 1929, F. CLARKE. This is the var. APETALA Moench.—DRUCE.

†42/10. ALYSSUM MARITIMUM Lam. Established at Woodthorpe, near Staveley, Derby, DRABBLE; Ascot, Berks, garden form, DRUCE.

45/7. COCHLEARIA DANICA L. Marsh-side, north of Southport, S. Lancs, always heliotrope or lilac colour, April 1929, HOLDER.

†47/2. HESPERIS MATRONALIS L. In a meadow near Cuxham, Oxon, on rubbish, DRUCE; in great beauty and plenty in copses at Trapp, Llandeilo, Carmarthen, WEBB.

†48/1. WILCKIA MARITIMA Scop. Southport, Lancs, HOLDER; Kennington, Berks, DRUCE.

†49/3. SISYMBRIUM ALTISSIMUM L. Thornton Hough, Cheshire, 1929, MASON; Hassocks, E. Sussex, Lady ALETHEA BUXTON; South Molton, N. Devon, DRUCE.

†49/4. S. ORIENTALE L. Cowling, Grassington, Bamoldswick, etc., Yorks, FRANKLAND; Malham, Yorks, GAMBIER-PARRY; Skipwith, Yorks, DRUCE.

†49/13. S. LOESELII L. Newport, Isle of Wight, LONG; Ascot, DRUCE and Lady DAVY.

†49/15. S. POLYCERATUM L. Burton-on-Trent, Staffs, DRUCE.

50/1. ERYSIMUM CHEIRANTHOIDES L. South Molton, N. Devon, DRUCE.

†51/1. CONRINGIA ORIENTALIS (L.) Dum. Great Wymondley, Hitchin, Herts, LITTLE; Sketty, Glamorgan, C. MARKS.

†54/7. BRASSICA TOURNEFORTII Gouan. Burton-on-Trent, Staffs, DRUCE, teste Prof. O. E. SCHULZ.

†54/16. B. JUNCEA (L.) Czern. & Coss. South Molton, N. Devon, September 1929; Newhaven, E. Sussex, DRUCE, teste Prof. O. E. SCHULZ; Shawford Railway, S. Hants, RAYNER; Tiverton, Devon, Col. WATTS.

(BURSA.—All the plants have been named by Dr E. Almquist.)

59/2. BURSA ABSCISSA (E. At.). Byfleet, Surrey, DRUCE.

59/3. B. ANGLICA (E. At.). Tenby, Pembroke, Miss TODD; Burnham, Somerset; Burton-on-Trent, Derby, DRUCE; Wymondley, Herts, H. PHILIPS.

59/4. B. BATAVORUM (E. At.). Sheepstead, Frilford, Berks; Tewkesbury, Bristol, W. Gloster; Tusmore, Oxon; Mells, N. Somerset; Fawler, Ivinghoe, Bucks; Thorpe, Northants; Penzance, Cornwall; Avoca, Wicklow, DRUCE.

59/5. B. BELGICA (E. At.). Gangsdown, Oxon; Tewkesbury, W. Gloster, DRUCE.

59/6. B. BREMENSIS (E. At.). Bowood, Wilts; Badby, Northants; Kingstown, Dublin, DRUCE.

59/7. B. BRITTONII (E. At.). Trewsbury, Gloster; Kennington, Berks; Skipwith, Yorks; Inchdowrie, Clova, Angus, DRUCE.

59/9. B. DRUCEANA (E. At.). Tenby, Pembroke, Miss TODD; Ascot, Berks; Aynhoe, Northants; Riever, N. Wilts; Bowood, S. Wilts; Aynhoe, Cuxham, Oxon; Avoca, Wicklow, DRUCE; Wymondley, Herts, H. PHILIPS.

59/10. B. GALLICA (E. At.). Highbridge, N. Somerset; Frilford, Berks; Wheatley, Oxon; Burton-on-Trent, Buxton, Derby, DRUCE; Blisworth, Northants, DIXON.

59/20. B. PATAGONICA (E. At.). Coleman's Moor, Kennington, Aldermarston, Berks; Hambleden, Bucks; Burnham, Mells, N. Somerset; Stow Wood, Oxon; Stansteadbury, Herts; Riever Wood, N. Wilts; Bowood, S. Wilts; Skipwith, Yorks; Hayle, Penzance, Cornwall, DRUCE.

59/24. B. ROBUSTA (E. At.). Byfleet, Surrey; Weston-super-Mare, N. Somerset; Burton-on-Trent, Derby, DRUCE.

59/26. B. TREVIRORUM (E. At.). Hitchin, Herts; Bury St Edmunds, W. Suffolk, H. PHILIPS; Weston-super-Mare, N. Somerset; Glasbury, Radnor, DRUCE; Barby, Horton, Barnack, Northants (*Nat. Hist. Herb.*).

59/27. B. TURONIENSIS (E. At.). Burton-on-Trent, Derby; South Molton, N. Devon; Wareham, Dorset; Malvern, Worcester; Gravestone, Yorks; Coleman's Moor, Berks; Riever, N. Wilts; Winterborne Steepleton, Dorset; Glasbury, Radnor, DRUCE; Oxsted, Surrey, June 19, 1927 (as *mediterranea*), in *Rep. B.E.C.*, 725, 1928, J. E. LOUSLEY.

†60/1. CORONOPUS DIDYMUS Sm. On rubbish about Ascot, Berks, a comparatively recent introduction into the county, DRUCE and Lady DAVY.

*60/2. C. CORONOPUS (L.) Karst. Hay, Brecon; Clyro, Radnor, WEBB.

†61/2. LEPIDIUM LATIFOLIUM L. Just before Baldock, on the Royston and Baldock road, Miss MARGARET BROWN, v.sp.

†61/3. L. DRABA L. A pest of arable land, Gobions Farm, Stapleford, Herts, 1929. It has spread over N. Herts in a most remarkable manner during the last 30 years and is now met with everywhere, LITTLE.
Var. SUBINTEGRIFOLIUM Mich. Burton-on-Trent, Staffs, 1929, DRUCE.

†61/4. L. RUDERALE L. Abundant at Malvern Railway Station, Worcester, DRUCE.

61/7. L. SMITHII Hook., var. ALATOSTYLUM (Towns.). Bridford, R. WATERFIELD in *Devon Tr.*, 96, 1929.

†61/8. L. PERFOLIATUM L. "New York," near Boston, Lincs, E. J. HURST.

†61/10. L. CHALEPENSE L. Burton-on-Trent, Staffs, DRUCE and CURTIS.

†61/20. L. VIRGINICUM L. Burton-on-Trent, Derby, July 1929, DRUCE and CURTIS, teste AELLEN.

†61/22. L. DENSIFLORUM Schrad. Ascot, Berks; Burton-on-Trent, Staffs; Hovingham, Yorks, DRUCE, teste SCHULZ.

†61/24. L. NEGLECTUM Thell. Burton-on-Trent, Staffs, July 1929, DRUCE and CURTIS, teste AELLEN.

64/1. THLASPI ARVENSE L. Bosahan, Cornwall; South Molton, N. Devon, DRUCE; new sea wall, Southport, S. Lancs, HOLDER and WAGSTAFFE; Ness, Stromness, Orkney [4127], JOHNSTON.

†65/2. IBERIS UMBELLATA L. Hillside near Southport, S. Lancs, HOLDER and WAGSTAFFE.

†72/1. MYAGRUM PERFOLIATUM L. Burton-on-Trent, Staffs, DRUCE and CURTIS.

†74/2. BUNIAS ORIENTALIS L. Common about Basildon, Berks; North Leach, Andoversford, E. Gloster, DRUCE.

†79/1. ERUCARIA HISPANICA (L.) Dr. Southampton, 1929, Miss TODD; Burton-on-Trent, Staffs, DRUCE and CURTIS.

†85/1. RESEDA ALBA L. Burton-on-Trent, Staffs, DRUCE and CURTIS.

87/1. HELIANTHEMUM HELIANTHEMUM (L.) Karst. Pont Erwyd, Cardigan, WEBB.

*88/3. VIOLA SILVESTRIS Lam. Tarbert, N. Harris, August 1928, DRUCE.
Var. PUNCTATA Dr. Riever, Berks and Wilts, DRUCE.

88/4. V. RIVINIANA × RUPESTRIS. Shefford Woodlands, Berks, DRUCE.
Var. DIVERSA Greg. Shefford, Berks, DRUCE.

*88/5. V. RUPESTRIS Schmidt, var. GLABRESCENS Becker. Arncliffe, Yorks, MASON; Rancliff Wood, Notts, BULLEY; Woody Bay, N. Devon; Shefford, Berks, DRUCE.
Var. SUBPUBESCENS Greg. Shefford, Berks.

88/6. V. CANINA L. × LACTEA = INTERMEDIA (Wats.). Melmerby, Cumberland, May 1915, MASON.

88/8. V. ODORATA L., var. DUMETORUM (Jord.). Common in Glamorgan, Miss VACHELL.

Var. SUBCARNEA (Jord.). St Nicholas, Llantrithyd, Glamorgan, Miss VACHELL.

88/14. V. CONTEMPTA Jord. Coleman's Moor, Berks, July 1929, DRUCE. Distributed this year.

88/15. V. VARIATA Jord., var. SULPHUREA Drabble. High Over Farm, Hitchin, Herts, H. PHILIPS, teste DRABBLE; Bradenham, Bucks, specimens distributed this year; type, Newtimber, Sussex, DRUCE.

88/17. V. MONTICOLA Jord. Sennen, Cornwall, Miss M. THURSTON in Thurston's *Notes on the Cornish Flora*, 2, 1929.

88/22. V. AGRESTIS Jord. High Over Farm, Hitchin; Letchworth; Wilbury Hill, Herts, H. PHILIPS, teste DRABBLE; Aynhoe, Northants and Oxon; Riever, Wilts; Forfar, Angus, DRUCE.

88/24. V. OBTUSIFOLIA Jord. Rushcliffe, Notts; Hinton, Northants, DRUCE.

88/25. V. LATIFOLIA Drabble. Near Saunton, N. Devon, September 1929; garden weed, Oxford Botanic Gardens, DRUCE.

88/26. V. RURALIS Boreau. Chalky fields, Gangsdown Hill, Oxon, 1929, untypical, DRUCE.

88/28. V. DESEGLISEI Jord. High Over Farm, Hitchin; Little Wymondley, Herts, H. PHILIPS, teste DRABBLE; *Symond's Yat, W. Gloster, a long and straggling form, DRUCE.

88/31. V. LEPIDA Jord. Melvich, W. Sutherland, DRUCE.

88/33. V. LUTEA Huds. (The yellow-flowered form). Balnaboth, Angus, August 1929, DRUCE.

88/34. V. CURTISII Forst. The yellow-flowered form, FORSTERI. Thetford, Norfolk, H. PHILIPS.

88/35. V. PESNEAUI Lloyd & Fouc. Links of Tresta, Fetlar, JOHNSTON in *Trans. Bot. Soc. Edin.*, teste DRABBLE.

†93/3. TUNICA SAXIFRAGA Scop. Garden escape, Abbotsbury, Dorset, Sir M. ABBOT ANDERSON.

†95/1. SAPONARIA OFFICINALIS L. Boughrood, Radnor, September 1929, DRUCE.

96/2. SILENE ANGUSTIFOLIA S. & T., var. PUBESCENS (DC.). Marlborough, Wilts, Mrs WEDGWOOD.

96/3. S. CONICA L. In clover, near High Down, Herts, 1875, leg. JAS. POLLARD. By the kindness of Miss Pollard, I have been allowed to examine two sheets in the Herbarium of Joseph Pollard, of High Down. One is *Silene anglica* L. and the other *S. quinquevulnera* L. Dr Drabble concurs. This removes the only record of *S. conica* for Herts, LITTLE.

96/4. S. NOCTIFLORA L. South Molton, N. Devon, DRUCE.

96/10. S. DUBIA Herbich. *The Flora of Hampshire* and *Supplement* record only *S. nutans* L., but *S. dubia* Herbich is recorded for South Hants, v.-c. 11, in the second *Supplement to Topographical Botany*, on the authority of "Reid sp. to Salmon." The Portsea island plant distributed this year is apparently *dubia*, as is also the plant from Browndown, which is adjacent to Stokes Bay, Gosport. The other stations for *nutans* in v.-c. 11 are a doubtful record for Portsdown, in the same district as the above two stations, and Milford in the New Forest district. There would therefore appear to be considerable doubt as to the occurrence of *S. nutans* in v.-c. 11, all being *S. dubia* Herbich, with the exception, possibly, of the Milford station.—P. M. HALL.

†96/20. S. ARMERIA L. Found by Mrs HARDINGE on the edge of a ploughed field among nettles, groundsel and chickweed, near Chapel House, Dumfriesshire, October 1929, ex Hon. Mrs ADEANE.

†96/24. S. MUSCIPULA L. Burton-on-Trent, Staffs, DRUCE and CURTIS.

†98/6. LYCHNIS PRESLII Sekera. A small patch of it growing among bushes near a path and close to ordinary *L. dioica* L. A most interesting discovery made by Miss ANN WYNDHAM of Orchard Wyndham, Somerset, who sent it to the Botanical Section of the Somerset Archæological Society. The specimen was sent to me by the advice of Mr W. D. Miller. This solitary clump of the *Lychnis Preslii* helps to support the theory that it is a mutant, but one awaits further exploration of the neighbourhood.—DRUCE.

*100/2. CERASTIUM ARVENSE L. Oat fields, etc., Sandwick, Orkney, JOHNSTON in *Trans. Bot. Soc. Edin.*

101/6. STELLARIA DILLENIANA Moench. Askham, Yorks, August 1929. This is the wholly green form, *VIRIDIS Fries. DRUCE.

101/7. S. GRAMINEA L., monstrosa. In a damp copse, north of the Hog's Back, Surrey, as a small clump about two feet high, July 1929. This differs from the type in its much wider sepals, the shorter and more rounded points of the petals, and its abundance of flowers from each stalk, C. M. ASH. The sepals are shorter than usual, and the veins are strongly marked. A few of the flowers have 10 petals, others are again apetalous. It appears to be a monstrous condition.—DRUCE.

103/8. SAGINA APETALA Ard., var. PROSTRATA S. Gibs. Welland, Worcester, TOWNDROW.

103/9. S. REUTERI Lange. Gravel walks, Tenby, Pembroke; Tedstone Delamere, Hereford; wall of Cotheridge Court, Worcester, TOWNDROW; Burnham, N. Somerset, MILLER, teste W. H. PEARSALL. It is still growing at Malvern Station, where I was just in time to prevent it being poisoned with weed-killer.

103/11. S. PROCUMBENS L., var. PENTAMERA (R. & F.) Dr. Santon Warren, Norfolk, LITTLE.

105/1. SPERGULARIA RUPICOLA Lebel. Lizard, Cornwall, Miss OVERY.

*105/3. S. SALINA Presl. In garden gravel of Weston Park, Shipston-on-Stour, Warwick, RIDDELSDELL in *Journ. Bot.*, 283, 1929.

†108/1. CLAYTONIA SIBIRICA L. Side of brook, Kendal, Westmorland; streams close to Cartmel Fell, Lancs, 1929, LOUIS BAKER; near Cadby, Leicester, F. SOWTER.

112/1. HYPERICUM ANDROSAEMUM L. Woody Bay, N. Devon, DRUCE.

112/7. H. MONTANUM L. Llansannor, Glamorgan, a glabrescent form, but with very short hairs on under side of leaves, Miss VACHELL.

*112/8. H. HIRSUTUM L. Burn of Geo Firth, Orkney [4074], JOHNSTON in *Trans. Bot. Soc. Edin.*

112/9. H. PULCHRUM L., var. PROCUMBENS Rostr., or near it. Clare Island, Mayo, W. CARRUTHERS and Mrs WEDGWOOD.

112/12. H. QUADRANGULUM L. Sibford, Oxon. A few of the upper leaves have a few pellucid spots but the sepals are not all rounded at the top as they should be in var. *occidentale* Franchet. It needs further study, DRUCE.

*112/13. H. DESETANGSII Lamotte. A weed in Botanic Garden, Cambridge, and in Mr Foggitt's garden at Thirsk, Yorks, DRUCE, teste DRABBLE.

†115/2. ALTHAEA HIRSUTA L. Medina, Isle of Wight, LONG.

117/1. MALVA MOSCHATA L., var. GERANIIFOLIA W. & L. Ascot, Berks, DRUCE.

117/2. M. SYLVESTRIS Brot., var. LASIOCARPA Druce. Burry Port, Carmarthen, Miss TODD.

Var. MICRANTHA Bromf. Burton-on-Trent, Staffs, DRUCE, teste FRASER.

†117/4. M. PUSILLA Sm. Tenby, Pembroke, Miss TODD.

†117/7. M. NICAEENSIS All. Burton-on-Trent, Staffs, DRUCE; Splott, Cardiff, Glamorgan, R. L. SMITH.

124/1. RADIOLA RADIOLA (L.). Roan Island, W. Sutherland, Mr JUSTICE TALBOT.

127/1. GERANIUM SANGUINEUM L., var. ALBIFLORUM. Birkdale, S. Lancs. Flowers one inch across. The plant may be of garden origin, HOLDER.

*127/3. G. SYLVATICUM L. Llangiwg, Glamorgan, C. MARKS, ex WEBB.

127/5. G. PHAEUM L. Near south gate of Knole Park, Sevenoaks, 1879, leg. H. N. LACHLAN, J. E. LITTLE.

127/14. G. ROBERTIANUM L., var. ALBUM. Hedgebank at Roccombe, S. Devon, and cultivated at Torquay without change of colour, Miss C. E. LARTER.

127/15. G. PURPUREUM Vill. Woody Bay, N. Devon, DRUCE.

†127/16. G. MACRORRHIZUM L. Herefordshire, Miss H. BALLARD, ex TOWNDROW.

†127/19. G. NODOSUM L. Skelwith village, Langdale, Westmorland, WEBB.

128/3. ERODIUM CICUTARIUM L'Hér., var. NEGLECTUM B. & S. Ainsdale, Lancs; Wexford, Ireland; Kenfig, Glamorgan, DRUCE.

132/1. OXALIS ACETOSELLA L., var. SUBPURPURASCENS DC. Bishops Tawton, R. TAYLOR; Harpford, Rev. G. HARRIS in *Devon Tr.*

†132/3. O. STRICTA L. Martin's Mere, Southport, S. Lancs, HOLDER and WAGSTAFFE; garden weed, Llandaff, Dyffryn, etc., Glamorgan, Miss VACHELL. It is given for Glamorgan in *English Botany.*

†133/4. IMPATIENS GLANDULIFERA Royle. River bank near Garrowby, E. Yorks, MARCHIONESS OF TITCHFIELD; Dunsfold, Surrey, GRIERSON; Fawley Court, Bucks, DRUCE.

136/1. ILEX AQUIFOLIUM L., var. LAURIFOLIUM Lej. Thursley, Surrey, Mrs WEDGWOOD.

†139/1. STAPHYLEA PINNATA L. Copse at Bowness, Westmorland, WEBB.

142/2. ACER CAMPESTRE L., var. LEIOCARPON Wallroth. Marlborough, N. Wilts, Mrs WEDGWOOD; Ufton, Warwick; Byfield, Northants, DRUCE; Lurgashall Mill, W. Sussex; Wymondley Road, Hitchin, Herts, LITTLE.

149/2. ULEX GALLII Planch., var. HUMILIS Planch. Above Woody Bay, N. Devon, DRUCE.

152/1. TRIGONELLA M. ORNITHOPODIOIDES DC. Growing on the shingly court-yard of Bosahan House, Cornwall, Miss CLARICE VIVIAN and DRUCE.

†152/14. T. ARABICA Delile. Burton-on-Trent, Staffs, DRUCE.

†153/1. MEDICAGO FALCATA L., var. TENUIFOLIOLATA Vuyck. Spital, Derby, DRUCE.

†153/2. M. SYLVESTRIS Fries. Perfectly naturalised near the shore, and near the Penally sub-way, Grangetown, Cardiff, Glamorgan, Miss VACHELL.

†153/6. M. MINIMA Desr., var. ELONGATA Rochel. Wool alien, Wymondley, Herts, LITTLE.

†154/4. MELILOTUS INDICA (L.) All. Sturton, E. Suffolk, H. L. GREEN; Pomona Cottage, Finstown, Orkney, JOHNSTON in *Trans. Bot. Soc. Edin.*

155/2. TRIFOLIUM PRATENSE L., var. PARVIFLORUM Bab. Alburgh, Norfolk, MASON.

155/3. T. OCHROLEUCON Huds. Alburgh, Norfolk, MASON.

†155/4. T. INCARNATUM L., var. STRAMINEUM Presl. Par Moor, Cornwall, MEDLIN, ex THURSTON.

†160/1. LOTUS SILIQUOSUS L. Plantation border on Pangbourne Down, Berks, DRUCE. Distributed this year.

†166/6. ASTRAGALUS BOETICUS L. Burton-on-Trent, Staffs, DRUCE and CURTIS. It still persists at Bath, and was flowering freely when Mr Green showed it us this year.

†170/1. CORONILLA VARIA L. Naturalised on the railway near Newhaven, Sussex, DRUCE and Lady ALETHEA BUXTON; Morn Hill, Winchester, Hants, Miss WHALE, ex RAYNER; Barnby Dun Station, Yorks, J. GOSTELOW, ex DALLMAN in *N.W. Nat.*, 194, 1929.

†171/4. ORNITHOPUS ROSEUS Dufour. Wood Vale, S. Lancs, F. H. GREEN.

176/1. VICIA SYLVATICA L. In some plenty on the steep banks and rocks of Woody Bay, N. Devon, DRUCE.

†176/5. V. VILLOSA Roth. Railway on the N. Denes, E. Norfolk, E. A. ELLIS.

176/36. V. GRACILIS Lois. Littleham, Devon, v.-c. 3, Major ORME. (Not v.-c. 4, teste Miss LARTER, in *Journ. Bot.*, 192, 1929.)

†178/1. LATHYRUS LATIFOLIUS L. Naturalised in the parish of Trewsbury, E. Gloster, Miss DIANA CATOR; on the Lynton railway-banks, N. Devon, DRUCE.

†178/3. L. TUBEROSUS L. In a shrubbery, Owslebury, S. Hants, Mrs PIERCE, ex RAYNER. Said to be spontaneous.

178/8. L. NISSOLIA L. Bramfield, Herts, in immense profusion, on heavy clay, derelict and arable, making great patches of many square yards, LITTLE.

(RUBUS RECORDS.—All determined by Mr W. Watson.)

185/3. RUBUS FISSUS Lindl. Near Norbury, Staffs, August 1920, S. A. BENNETT.

185/6. R. PLICATUS W. & N., the pink-flowered form = R. ROSULENTUS P. J. M. Queen's Mere, Berks, July 1929, DRUCE.

Var. BERTRAMII (G. Braun). Bognor Common, Sussex, July 1914, CUMMING (as *R. nitidus*, var. *albiflorus*).

Var. AMBLYPHYLLUS (Boul.) Sudre. Royal Common, Elstead, Surrey, August 1904, CUMMING (as *plicatus*).

185/8. R. OPACUS Focke. Witley Common, Surrey, August 1908, CUMMING (as *holerythros*).

185/14. R. IMBRICATUS Hort, var. DISCOLOR Sudre. Molland, N. Devon, September 1929, DRUCE.

Var. LONDINENSIS Rogers. Perranarworthal, Cornwall, August 1908, F. H. DAVEY (as *nemoralis* P. J. M., fide ROGERS).

185/18. R. LINDLEIANUS × ? CARDIOPHYLLUS. Limpsfield Common, Surrey, July 1913, FOX (as *R. Colemanni* Bab., teste E. F. LINTON).

185/19. R. ARGENTEUS W. & N., var. LONGICUSPIDATUS Sudre. Watersmeet, near Lynton, N. Devon, September 1929, DRUCE; Durdham Down, Bristol, W. Gloster, July 1910, Miss I. M. ROPER (as type).

185/24. R. OXYANCHUS Sudre. Branksome Park, Dorset, September 1902, ROGERS (as *nemoralis* P. J. M.).

Var. SILURUM (Ley). Hill, near Banbury, Oxon, RIDDELSDELL in *Journ. Bot.*, 283, 1929. Written without brackets, but I do not think Ley ever wrote *R. oxyanchus*, var. *Silurum*.

185/25. R. CARDIOPHYLLUS L. & M. Tadmarton, Oxon, August 1929, DRUCE; Witley Common, Surrey, August 1908, CUMMING (as *argentatus*); Clifton Down, Bristol, W. Gloster, August 1907, WHITE (as *rhamnifolius* W. & N.).—"Yes, the usual British form of this species."—W. M. R.

185/29. R. POLYANTHEMUS Lindeb. Redhill, Northants, August 1927, DRUCE.

185/30. R. MAASSII Focke, var. GLABRATUS (Bab.). Aber, Carnarvon, July 1899, DRUCE (as *R. ammobius* Focke, det. Focke).

185/33. R. MERCICUS Bagn., var. BRACTEATUS Bagn. Market Rasen, Lincs, August 1907, CUMMING (as *R. pallidus*).

185/40. R. RHOMBIFOLIUS Weihe. Colgate, St Leonard's Forest, W. Sussex, July 1906, WHITE (as *R. holerythros* Focke).

185/41. R. SCIAPHILUS Lange. Badby Wood, Northants, August 1921, RIDDELSDELL (as *R. silvaticus* W. & N.).

185/43. R. RAMOSUS Briggs. Wellingtonia Avenue, Berks, July 1929, DRUCE.

185/45. R. WINTERI P. J. M. Blackthorn, Bucks, September 1929, DRUCE.

185/48. R. PUBESCENS Weihe. By Kilsby Station, Northants, July 1913, CUMMING (as *thyrsoideus*).

185/52. R. LENTIGINOSUS Lees. Wellingtonia Avenue, Berks, July 1929, DRUCE.

185/56. R. SCHLECHTENDALII (Weihe). South Newington Hill, Oxon, July 1919, RIDDELSDELL. This Mr Watson refers to *R. Macrophylloides* Genev.

Var. ANGLICUS Sudre. Shotover, Oxon, August 1925, DRUCE (as type, det. RIDDELSDELL).

Var. MACROPHYLLOIDES (Genev.). Badby, Northants, CUMMING (as *sylvaticus*).

185/66. R. PYRAMIDALIS × ? CARDIOPHYLLUS. Bagley Wood, Berks, August 1929, DRUCE.

185/72. R. LASIOCLADOS Focke, var. ANGUSTIFOLIUS Rogers. Bagley Wood, Berks, August 1929, DRUCE.

185/80. R. MUCRONIFER Sudre. Redhill, Northants, August 1927, DRUCE.

185/83. R. ALTERNIFLORUS M. & L. Wimbledon Common, Surrey, July 1921, RIDDELSDELL (as *argenteus* W. & N., f. *glandulosa*).

185/84. R. APICULATUS W. & N. Ross Wood Estate, Ross, Hereford, September 1907, CUMMING (as *R. rosaceus*).

Var. ANGUSTICUSPIS (Sudre) Dr. Redhill, Northants, August 1927, DRUCE; road by south end of Kilsby Tunnel, Warwick, July 1913, CUMMING (as *thyrsoideus*).

185/91. R. ERICETORUM Lef. Redhill, Northants, August 1927, DRUCE.

185/95. R. NEWBOULDII Rogers. Lambridge Wood, Oxon, September 1929; Staffordshire, 1928, DRUCE.

185/98. R. GRIFFITHIANUS Rogers. (R. ERICETORUM Rogers, non L. & M.). Godalming, Surrey, August 1908, CUMMING.

185/103. R. ANDERSONII Lef. Littleworth Common, Surrey, August 1921, BARTON (as *festivus* M. & L.).

185/110. R. FUSCUS W. & N., var. HYPOSERICEUS Sudre. Wellingtonia Avenue, Berks, July 1929, DRUCE. Mr Watson thinks that this should be placed under *insericatus*.

185/112. R. PALLIDUS Weihe, var. LEPTOPETALUS Rogers. Forest near Micheldene, Gloucester, August 1907, CUMMING.

185/122. R. ROSACEUS W. & N., var. SCABRIPES (Genev.) Sudre. Feugh, Banchory, Kincardine, August 1927; Redhill, Northants, August 1927, DRUCE.

185/125. R. RUFESCENS L. & M. Birch Halt, Hereford, August 1907, CUMMING (as *R. hystrix*).

185/137. R. ANGUSTIFRONS Sudre, var. PALLIDISETUS Sudre. Bognor Common, Sussex, July 1914, CUMMING (as *R. serpens*).

185/145. R. TERETICAULIS Rogers. Boars Hill, Oxon, 1925, DRUCE (as *R. scaber*, det. RIDDELSDELL); Lodge Grove, Bishops Wood, Ross, Hereford, CUMMING (as *fuscus*).

185/148. R. INAEQUABILIS Sudre, var. ARISTISEPALUS Sudre. Wood borders, Upper Sapey, Herefordshire, August 1901, AUGUSTIN LEY (as *praeruptorum* Boul., det. Rogers).

185/149. R. DUMETORUM W. & N., var. FEROX (Weihe) Rogers. Twelve O'clock Drive Wood, Warwick, CUMMING (as *pallidus*).

185/151. R. CORYLIFOLIUS × VESTITUS. Sibford Mill, Oxon, August 1929, DRUCE.

187/2. ×GEUM INTERMEDIUM Ehrh. (RIVALE × URBANUM). Abundant in Asham Wood, Mells, Somerset, with Lady HORNER, July 1929, DRUCE.

188/2. FRAGARIA VESCA L., var. ALBESCENS Druce in *Rep. B.E.C.*, 394, 1927. Near Bridgend, Glamorgan, Miss CONSTANCE VERITY, ex Miss VACHELL.

189/2. POTENTILLA RUPESTRIS L. Still exists in Wales, although exterminated on Craig Briedden, DRUCE.

189/7. P. REPTANS L., var. FLORE-PLENO. Tenby, Pembroke, Miss TODD.

†189/11. P. NORVEGICA L. Attenborough, Notts, BULLEY; Guildford, Surrey, CLARKE; Burton-on-Trent, Staffs, DRUCE.

†189/17. P. INTERMEDIA L. Tregornith, Cornwall, TRESIDDER, ex THURSTON.

†189/22. P. ALBA L. Growing in long grass near an old over-grown garden (which was doubtless its origin), near Inchture, Ballinluig, Mid-Perth, F. WILSON.

190/2. ALCHEMILLA PRATENSIS Schmidt. Near Widdy Bank, Teesdale, Durham, with a form less hairy below, DRUCE.

190/3. A. CURTILOBA Buser. Middleton-in-Teesdale, on N.W. Yorkshire side of the Tees, v.-c. 64, DRUCE.

190/4. A. MINOR Huds. (FILICAULIS Buser). Talgarth, Radnor, September 1929, DRUCE.

190/5. A. PASTORALIS Buser. Middleton, N.W. Yorks, and Durham, August 1929, DRUCE.

190/8. A. ALPESTRIS Schmidt. Cave Hill, Antrim; Balnaboth, Angus, as a form *vegeta*; Middleton-in-Teesdale, Durham, as a form "à lobes un peu tronqués," but in other characters typical, DRUCE.

190/13. A. FIRMA Buser. Cauldron Snout, Durham, 1884, H. T. MENNELL. See C. E. SALMON in *Journ. Bot.*, 16, 1929.

190/18. A. ARGENTEA. G. Don. (CONJUNCTA Bab.). Ingleton, M.W. Yorks, 1882, J. WATKINS in *Hb. Brit. Mus.*; Rydal Mount, Westmorland, Rev. STILLINGFLEET in *Hb. C. Bailey*; Ullswater, J. WALTON in *Hb. A. W. Bennett*; Gatesgarth, Cumberland, 1844, BORRER; Mael Gredha, Mid-Perth, Dr HUGHES in *Hb. F. Bossey*; roadside near Thurso Cemetery,

Caithness, adventive, C. E. SALMON in *Journ. Bot.*, 16, 1929. It was discovered in a slightly different part of Glen Doll, Clova, this year by Mr FOGGITT, where I saw it in July. This is very near Don's original locality.

191/1. AGRIMONIA EUPATORIA L., var. UMBROSA Coss. & Germ. (SEPIUM Bréb.). Saccombe Pond, Herts, 1929 [n. 800], LITTLE.

191/2. A. ODORATA Mill. Black Down, W. Sussex. In *A. Eupatoria* the buds are nearly flat-topped, whereas in *odorata* the short mucrones of the sepals unite to form a little point—a character which Drabble thinks works, and which Salmon says works " nine times out of ten and then fails," LITTLE.

193/2. POTERIUM POLYGAMUM W. & K. Hillside, Southport, L. Lancs, HOLDER and WAGSTAFFE.

194/6. ROSA CANINA L., var. SPHAERICA (Gren.) Dum. Marlborough, Wilts, Mrs WEDGWOOD.

194/10. R. DUMETORUM Thuill. Marlborough, Wilts, Mrs WEDGWOOD.

Var. URBICA Leman. Marlborough, Wilts, Mrs WEDGWOOD.

Var. SEMIGLABRA (Rip.). Marlborough, Wilts, Mrs WEDGWOOD.

194/12. R. GLAUCA Vill., var. SUBCRISTATA, f. MYRIODONTA W.-Dod. Rackwick, Hoy, JOHNSTON in *Trans. Bot. Soc. Edin.*

†195/2. PYRUS COMMUNIS L. On an old disused track, Cotgrave, Notts, BULLEY; Wilts, Miss TODD.

*195/13. P. ARIA Ehrh. Cefnllys, Radnor, in plenty, WEBB.

195/14. P. LATIFOLIA Syme, var. DECIPIENS (Bechst.). N. Devon, Rev. H. H. HARVEY.

196/1. CRATAEGUS MONOGYNA Jacq., var. nov. GRACILIPES. Hoveton, Norfolk, Miss TODD. Calyx and tube glabrous; leaves narrow and gracile, with seven narrow segments which are gradually narrowed into a somewhat long recurved apex, DRUCE.

Var. GLABRATA Sonder. Hale, S. Lancs, TRAVIS.

×OXYACANTHOIDES. Ippolyt's Brook, Hitchin, Herts. First observed in May. Styles one or two. Leaves partly with lateral nerves outturned, partly in-turned, dark green and more like *Oxyacanthoides* in the mainly ternate lobing. Early partial glabrescence on peduncle and calyx, but traces of pubescence still remaining. Fruit large, 12 mm. long × 10 mm. broad, LITTLE.

†197/2. COTONEASTER MICROPHYLLUS Wallich. On the limestone cliffs of Cleeve Hill, Cheltenham, E. Gloster, GUY H. HOLLAND; Gwyrch,

Denbigh, DALLMAN in *N.W. Nat.*, 73, 1929. I saw it there over 60 years ago.

*199/3. SAXIFRAGA SPONHEMICA Gmel. Fforest Fawr, Carmarthen; Cwm Taf Fawr, Brecon, MARKS, ex WEBB.

199/19. S. RIVULARIS L. Ben More, Mid-Perth, C. V. MARQUAND.

†200/1. TELLIMA GRANDIFLORA Br. Alien, N.W. America. Wild in Devon, Dr VOELEKER in *Journ. Hort. Soc.*, xxvi., 1928.

†207/1. RIBES UVA-CRISPA L. Fruit glabrous. Side of stream, Hungerford, Berks, Miss TODD.

211/1. SEDUM PURPUREUM Link. Near Trelleck, Monmouth, C. AMHERST.

†211/3. S. REFLEXUM L. Abundant on a wall on a roadside near Cirencester, E. Gloster, DRUCE; *Duhonw Rocks, Brecon, WEBB.

214/1. HIPPURIS VULGARIS L. Tregaron Bog, Cardigan, WEBB. Queried by Dr Salter.

217/5. CALLITRICHE PEDUNCULATA DC. Leckwith Moor, Glamorgan, Miss VACHELL.

220/1. EPILOBIUM ANGUSTIFOLIUM L. Saunton, N. Devon, DRUCE. To remove ? in *Top. Bot.*

220/3. E. HIRSUTUM L. Burn of Geo Firth, Orkney [4111], JOHNSTON.

Var. VILLOSISSIMUM Koch. Braunton, N. Devon, September 1929, DRUCE.

×MONTANUM = ERRONEUM Haussk. Waste ground, Cardiff, Glamorgan, Miss VACHELL. The flowers are large as in *hirsutum*, but the leaves are much like *montanum*.

×PARVIFLORUM = INTERMEDIUM Reichb. Highbridge, N. Somerset, July 1929, DRUCE.

220/6. E. LAMYI F. Schultz. Garden ground, Welwyn, Herts, T. B. BLOW. Agreed to by Dr DRABBLE.

220/8. E. ROSEUM Schreber. A lax form at Glasbury, Radnor, DRUCE.

†220/15. E. NUMMULARIFOLIUM R. Cunn. By the side of a burn just below Allcock Farm, Grasmere, Westmorland, LOUIS BAKER.

†223/7. OENOTHERA SINUATA L. Burton-on-Trent, Staffs, DRUCE.

225/3. CIRCAEA ALPINA L. Side of Wye, Brecon, Miss DIANA CATOR.

*232/1. BRYONIA DIOICA Jacq. Cyro, Radnor, WEBB.

239/1. ERYNGIUM CAMPESTRE L. This has greatly increased on Scotney Down, near Winchester, and it was a remarkable sight last summer. Its discoverer there, Simon Baring, has just started for New Zealand where we hope other discoveries await him.—DRUCE. *Eryngium campestre* L. is recorded as native in the *Supplement of the Hants Flora* from two stations, one in each vice-county. It is also recorded as a native for N. Hants, v.-c. 12, in the second *Supplement to Topographical Botany*, from the Hon. Mrs Guy Baring's station, but in my opinion the plant is certainly not native in the other. It occurs in patches over several acres of a grass field and it is evidently thriving and increasing. The field looks to me like one which was arable and laid down to a sainfoin ley many years ago. The composition of the herbage is quite different to that of the virgin down nearby on which the *Eryngium* does not occur.—P. M. HALL.

†240/1. ASTRANTIA MAJOR L. Hedgerow plant near Stalham, Norfolk, Rev. E. C. CRUTWELL.

*244/1. SMYRNIUM OLUSATRUM L. Sennybridge, Brecon, WEBB.

†245/3. BUPLEURUM ROTUNDIFOLIUM L. Burton-on-Trent, Staffs, DRUCE and CURTIS.

245/5. B. TENUISSIMUM L. River Bure, Yarmouth, Norfolk (though reported extinct), E. A. ELLIS.

†245/6. B. LANCIFOLIUM Hornem. Tiverton, Devon, Col. WATTS; Splott, Cardiff, Glamorgan, R. L. SMITH.

†250/1. CARUM CARVI L. Muir of Ord, E. Ross, J. R. MATHESON in *N.W. Nat.*, 24, 1929.

†252/1. PRIONITIS FALCARIA (L.) Dum. Badsey, Worcestershire, known for the past 70 years, but unidentified, CARLETON REA.

253/2. SIUM ERECTUM Huds. Ditch between Winchelsea and Rye, E. Sussex, E. E. JENNER. A curious monstrosity—a "hen and chicken" variety.

255/2. PIMPINELLA SAXIFRAGA L., var. POTERIIFOLIA (Wallr.) Koch. Lambridge Wood, Oxon, July 1929, Mrs WEDGWOOD.

265/3. OENANTHE CROCATA L., var. TENUIFOLIOLATA Druce. Freshfield, S. Lancs, HOLDER, v.sp.

266/1. AETHUSA CYNAPIUM L., var. AGRESTIS Wallr. Aynhoe, Northants, and Oxon, September 1929, DRUCE. Specimens distributed this year.

*276/3. PEUCEDANUM SATIVUM (L.) B. & H. Abundant between Askham and Furness, v.-c. 69, WEBB.

†276/4. P. (ANETHUM) GRAVEOLENS L. Belford, Northumberland, GAMBIER-PARRY.

†276/5. P. OSTRUTHIUM Koch. Carrston Mill Burn, Stromness, Orkney [3979], JOHNSTON in *Trans. Bot. Soc. Edin.* His No. 3402 was *Heracleum*.

†277/1. HERACLEUM MANTEGAZZIANUM S. & L. Hay, Brecon, WEBB; Mells, Somerset, DRUCE; Wilcot, Oxon, DRUCE.

277/2. H. SPHONDYLIUM L., var. ANGUSTIFOLIUM Huds. Helston, Cornwall, July 1929, DRUCE.

283/5. CAUCALIS NODOSA Scop., var. PEDUNCULATA (R. & F.) Dr. Chalk Hill, near Luton, Beds, 1838, *Hb. Luton*.

†283/8. C. LATIFOLIA L. Lockerly, Hants, Miss SALMON; railway ballast at Eckington, Worcester, CARLETON REA; Burton-on-Trent, beautiful specimens, DRUCE.

284/1. HEDERA HELIX L., var. BOREALIS Druce. Woody Bay, N. Devon, September 1929, DRUCE.

Var. SARNIENSIS Druce. Woody Bay, N. Devon; Bosahan, Cornwall, DRUCE. Forma VARIEGATA. Lynton, N. Devon, DRUCE.

287/3. SAMBUCUS EBULUS L. Llanfairfechan, Carnarvon, BRITTON; Bolton-on-Dearne, S.W. Yorks, H. G. PAYNE, see *N.W. Nat.*, 24, 1929; Godrergraig, Glamorgan; Llandovery, Carmarthen, WEBB. [At Kythraea, new to Cyprus, DRUCE.]

†292/1. LEYCESTERIA FORMOSA Wallich. Quite naturalised about Woody Bay, N. Devon, September 1929, DRUCE.

296/3. GALIUM ERECTUM Huds. Cheddar, N. Somerset; Yarnton, Oxon, DRUCE.

300/1. SHERARDIA ARVENSIS L., var. OVATA Fisch.-Benz. Micheldever, Hants, Col. PAYNE; Lostock, Lancs, MASON.

304/2. VALERIANELLA ERIOCARPA Desv. Budleigh Salterton, S. Devon, Major ORME in *Devon Tr.*, 81-92, 1928; Splott, Cardiff, Glamorgan, R. L. SMITH.

308/4. SCABIOSA SUCCISA L., f. NANA. Bude, Cornwall, MASON.

310/1. EUPATORIUM CANNABINUM L., var. SUBINTEGER Druce. Ditches near Deal, E. Kent, 1921, FOX.

312/1. SOLIDAGO VIRGAUREA L., sub-var. ACUTIFOLIA Dr. Mickle Fea, Hoy, Orkney; Silda Wick, Wick of Tresta, Fetlar, Zetland, JOHNSTON.

Var. LANCEOLATA Dr. Runcat Gill, Hoy, JOHNSTON; Watersmeet, N. Devon, DRUCE.

Var. INTERRUPTA Dr. Hunter's Inn, N. Devon; Boughrood, Radnor, DRUCE.

†312/3. S. LANCEOLATA L. Abbotsbury, Dorset, Sir M. ABBOT ANDERSON.

†312/5. S. SEROTINA Ait. Near Inkpen, Berks, HURST; Brackley, Northants, DRUCE. Distributed this year.

326/1. ANTENNARIA DIOICA (L.) Gaertn., forma ROSEA. Cornwall, Miss CLARICE VIVIAN and DRUCE; Balnaboth, Angus, DRUCE. Deep rose-pink flowers.

333/1. INULA HELENIUM L. By the river-side in Upper Wharfedale, a good bed, with many flowers, J. FRANKLAND.

†339/3. AMBROSIA ARTEMISIFOLIA L. Near St Michael on Wyre, Garstang, Lancs, The Ven. Archdeacon HORNBY.

†341/1. XANTHIUM SPINOSUM L. Wool alien, Great Wymondley, Herts, LITTLE.

†347/13. HELIANTHUS DIFFUSUS Sims. (RIGIDUS). Waste ground, Ascot, Berks, October 1929, DRUCE.

†354/1. GALINSOGA PARVIFLORA Cav. In a yard at Beckenham, Kent, PAYNE.

†355/2. MADIA SATIVA Molina. Garden week, Finstown, Orkney, JOHNSTON in *Trans. Bot. Soc. Edin.*

†356/1. HEMIZONIA PUNGENS T. & G. On ballast, Hythe, Kent, Miss C. M. GIBBINGS.

†362/2. TAGETES MINUTA L. Potato field, Skipwith, Yorks, DRUCE.

365/1. ACHILLEA MILLEFOLIUM L., var. CONSPICUA Druce. Riever, N. Wilts; Boughrood, Radnor; Burton-on-Trent, Derby; Market Harborough, Leicester; Barnstable, N. Devon, DRUCE.

†368/4. ANTHEMIS COTULA L. Alien, Stromness, Orkney [4125], JOHNSTON.

†370/8. CHRYSANTHEMUM MAXIMUM DC. Alien, Pyrenees, etc. Burton-on-Trent, Staffs, DRUCE.

†370/17. C. CORONARIUM L. Purwell Field, Hitchin, Herts, LITTLE; South Molton Railway, N. Devon, DRUCE.

†372/1. COTULA AUREA Loefl. Alien, Mediterranean. Burton-on-Trent, Staffs, DRUCE, teste FRASER.

†380/2. PETASITES ALBUS (L.) Gaertn. Naturalised at Balnaboth, Angus, Lady ELPHINSTONE and DRUCE.

†*380/3. P. FRAGRANS Presl. Hay, Brecon, WEBB.

†383/1. SENECIO SARRACENICUS L. Side of stream, Ashford, Steep, S. Hants, F. R. BROWNING, see *Fl. Hampshire*; by river below Enniskerry, Co. Wicklow, Major ORME, *in litt.*

383/3. S. AQUATICUS Hill, forma. Pixey Mead, Oxon, July 1929, DRUCE. Conspicuous from its sub-simple growth and large flowers. Distributed this year.

*383/4. S. ERRATICUS Bert. Freshwater, Isle of Wight, E. DRABBLE in *Journ. Bot.*, 42, 1929.

383/6. S. ERUCIFOLIUS L., var. DISCOIDEUS Dr. Par Harbour, Cornwall, 1929, MEDLIN.

383/7. S. SQUALIDUS L. Hitchin, Herts, H. PHILIPS.
Var. LEIOCARPUS Dr. Near Diss, Norfolk, Miss DIANA CATOR.

†383/8. S. VISCOSUS L. On railway tip, Hitchin, Herts, LITTLE; Coniston, Furness, WEBB.

383/32. S. INTEGRIFOLIUS (L.) Clairv. (CAMPESTRIS DC.). Galley Hill, Stopsley, Beds, 1929. Saunders' *Field Fl. of Beds* says "apparently limited to the Lower Chalk escarpment." Galley Hill is mainly Middle Chalk, and I believe a small portion rises above the Chalk Rock, *i.e.*, is Upper Chalk, LITTLE.

†385/2. CALENDULA ARVENSIS L. Burton-on-Trent, Staffs, DRUCE and CURTIS; South Molton, N. Devon, DRUCE.

393/1. ARCTIUM LAPPA L. (MAJUS Bernh.). My first record for the Lea basin. I have only one for the Iver basin—Purwell, Hitchin, Herts, 1924-7, and believe it rare for the district, LITTLE.

393/2. A. NEMOROSUM Lej. Braunton, N. Devon, DRUCE.

395/2. CARDUUS ACANTHOIDES L. Tenby, Pembroke [12], Miss TODD.

×NUTANS = NEWBOULDII Wats. Burton-on-Trent, Derby; Long Melford, W. Suffolk, July 1929, DRUCE.

†395/3. C. PYCNOCEPHALUS L., var. TENUIFLORUS (Curt.). Near Wymondley, Herts, in field dressed with shoddy, Mrs MACALISTER HALL; a nearly glabrous form, Burton-on-Trent, Staffs, DRUCE.

396/1. CIRSIUM ERIOPHORUM Scop. A photograph of a specimen, seven feet high, growing in Mr F. J. Hanbury's garden at Brockhurst, is given on p. 401 of the *Gardeners' Chronicle* for November.

396/8. C. ARVENSE × PALUSTRE = MIXTUM Druce. Par, Cornwall, MEDLIN, ex THURSTON.

396/9. C. PALUSTRE Scop. A form with the middle leaf lobe much prolonged (5 inches), Hoveton, Norfolk, Miss TODD.

†397/1. ONOPORDON ACANTHIUM L. Braunton Burrows, N. Devon, DRUCE.

†397/2. O. TAURICUM Willd. Burton-on-Trent, Staffs, DRUCE.

†397/3. O. ILLYRICUM L., var. MACRANTHUM Boiss. Garden, Aberfeldy, Mid-Perth, Miss M. S. CAMPBELL.

*405/7. CENTAUREA PRATENSIS Thuill. Towersey, Bucks, MASON.

405/8. C. OBSCURA Jord. Highbridge, Somerset; Hunter's Inn, N. Devon, DRUCE.

405/11. C. NEMORALIS Jord. High Force, Durham, v.-c., 66; Winch Bridge, N.W. Yorks, v.-c. 64, DRUCE; Geo Firth, Orkney, JOHNSTON in *Trans. Bot. Soc. Edin.*

Forma RADIATA. Trelleck, Monmouth, AMHERST.

†405/31. C. SOLSTITIALIS L. Puttenham, Surrey, CLARKE; near Wilbury Hill, Herts, BRUNT; near Walsworth, Herts, LITTLE; Torquay, Devon, Miss C. E. LARTER; Martin's Mere, Southport, Lancs, HOLDER and WAGSTAFFE.

†405/32. C. MELITENSIS L. Walsworth, Hitchin, Herts, LITTLE.

†405/37. C. SALMANTICA L. Weed, Nottingham, 1929, BULLEY; Burton-on-Trent, Staffs, DRUCE.

†407/1. CARTHAMUS LANATUS L. Hitchin, Herts, HUGH PHILIPS.

†407/3. C. TINCTORIUS L. Swanage, Dorset [41], Miss TODD; Kennington, Berks, DRUCE.

*416/2. CREPIS PALUDOSA Moench. Llanbister, Radnor, WEBB.

416/4. C. NICAEENSIS Balb. Thanks to Mr Flintoff's kindness, Major LAWSON sent me most beautiful specimens last June from Burton

Agnes, York. It grew in great quantity and luxuriance, up to four feet high, and averaging three and a half feet. Many had from 20 to 30 fully expanded large flowers. It grew on a piece of waste land which 40 years ago was consecrated for a cemetery, but this part has never been utilised.—DRUCE.

416/5. C. CAPILLARIS (L.) Wallr., var. ANGLICA Dr. & Thell. Turleton, S. Lancs, HOLDER; Malvern Station, Worcester; Ledbury, Hereford; Market Harborough, Leicester; South Molton, N. Devon, DRUCE; Barlow, Derby, E. DRABBLE.

†419/6. HIERACIUM PRAEALTUM Vill. Hungerford Railway, HURST and DRUCE; Hanslope, Bucks, DRUCE.

Var. BAUHINI Koch. Railway, Great Bedwyn, Wilts, HURST and DRUCE, to note their persistence. On a "Hieracium" standard, *Bauhini* should be kept as a species.

†419/7. H. STOLONIFLORUM W. & K. Railway Bank near Hanslope, Bucks, spreading freely, and known as growing there for over twenty years, DRUCE. Specimens now distributed.

†419/8. H. AURANTIACUM L. (N.P.). Budleigh Salterton, S. Devon, Major ORME, *in litt.*

†419/9. H. CLAROPURPUREUM N. P. Great Orme, Carnarvon, JOHN CRIPPS; in considerable quantity by the railway at South Molton, N. Devon (specimens distributed this year), and in still greater abundance on the railway banks near Barnstable, where it was recorded some years ago, DRUCE; near Southwick, Brighton, Sussex, E. PAYNE.

419/169. H. PORRIGENS Almq. Watersmeet, N. Devon, September 1929, DRUCE.

†419/187. H. PULMONARIOIDES Vill. Completely naturalised, and in great quantity, on many walls in the village of Mells, N. Somerset, and on the Bridge in hundreds, spreading into the Iron valley where it grows on some of the ruined buildings. It makes a splendid show. I notice *H. amplexicaule* is recorded for Mells by Marshall, and the record probably refers to this handsome species: indeed the name was corrected. How it reached this place is a difficult question to answer. I do not remember noticing it when I visited Mells many years ago, but that was not at the flowering period. Specimens are distributed this year, DRUCE.

419/241. H. UMBELLATUM L., ? var. CORONOPIFOLIUM Bernh. In 1924 I gathered it in an old gravel pit at Ickleford, near the Midland Railway, and again on August 5, 1929. It is the only station known to me in N. Herts. The nearest locality is at Maulden, Beds, on greensand. I think it may possibly have arrived along the railway from the north, LITTLE.

422/1. LEONTODON HISPIDUS L., var. SORDIDUS Bab. West Burn of Houbie, Fetlar, JOHNSTON.

Var. SIMPLEX Duby. Moo Wick, Fetlar, JOHNSTON.

With rather more entire leaves, on the magnesian limestone north of Castle Eden Dene, Durham, T. ASHTON LOFTHOUSE.

(TARAXACA all named by Dr H. Dahlstedt.)

423/1. TARAXACUM BRACHYGLOSSUM D. Yardley Gobion, Northants; Burton, Staffs; Dawlish, S. Devon, DRUCE.

423/2. T. DECIPIENS Raunk. A form related to this at Holton Pits, Oxon; Freshwater, Isle of Wight, DRUCE.

423/4. T. FULVUM Raunk. Penzance, Cornwall; Pershore, Worcester, DRUCE; Ganavan, Argyll, Mrs MACALISTER HALL.

Nov. var. vel species, Nisishee, S. Harris, 1928, DRUCE.

423/5. T. GLAUCINUM D. Heath and Reach, Beds, DRUCE.

423/6. T. LACISTOPHYLLUM D. Lizard, Cornwall; Sheepstead, Berks; Bosahan, Cornwall; Byfleet, Surrey; Tusmore, Stanton St John, Oxon; Riever, N. Wilts; Hinksey, Frilford, Berks; Evesham, Worcester, DRUCE.

423/10(2). T. RUBICUNDUM D. Allied to this species, Great Malvern Station, Worcester, DRUCE.

423/17. T. BRITANNICUM D. Steeple Aston, Oxon, (modif.); [a small form, probably this, Majorca], DRUCE.

423/21. T. DEVIANS D. Freshwater, Isle of Wight (modif.); Wytham, Berks, DRUCE. Previously only known from the Orkneys.

423/23. T. FAROENSE D. Ganavan, Argyll, Mrs MACALISTER HALL; Blackdown, W. Sussex, Preb. R. J. BURDON; Winch Bridge, Durham, Mrs WEDGWOOD; Cronkley, N.W. Yorks, DRUCE.

423/25(2). T. LANDMARKII D. Ganavan, Argyll, Mrs MACALISTER HALL; Wytham, Berks; " seems to be this," North Aston, Oxon, DRUCE. Previously only known from Zetland.

423/27. T. NAEVOSIFORME D. High Force, Durham; Killarney, Co. Kerry, DRUCE.

423/28. T. NAEVOSUM D. Bradenham, Bucks; Bracknell, Berks; Roundstone, Co. Galway (modif.), DRUCE.

423/29. T. NORDSTEDTII D. Ganavan, Argyll, Mrs MACALISTER HALL; probably a form of this, Yarnton Meadows, Oxon, DRUCE.

423/36. T. ADIANTIFRONS Ekm., forma. Tarbert, Harris, 1928, DRUCE.

423/37. T. ALATUM Lindb. Ham, Northants, with forma; Shefford Woodlands, Berks; Elsfield, Oxon; Evesham, Worcester, DRUCE.

423/45. T. BIFORME D. A plant resembling this to some degree, Carnsore, Wexford, 1928, DRUCE.

423/46(2). T. CAPHOCENTRUM D. Seems to be this, railway by Notley Abbey, Bucks, DRUCE.

423/51. T. DAHLSTEDTII Lindb. Northleigh, Oxon (probably a form); Tubney Wood, Berks; Ledbury, Hereford; Ivinghoe, Bucks, DRUCE.

423/52. T. DILATATUM Lindb. Tintern, Monmouth (perhaps this), AMHERST.

423/55. T. EXPALLIDIFORME D. North Aston, Oxon (modif.); Ivinghoe, Bucks, seems to be this, DRUCE.

423/61. T. HAMATUM Raunk. Bosahan, Helston, Cornwall (modif.); Ham, Northants; Byfleet, Surrey; Little Bedwyn, N. Wilts; Shefford, Sheepstead, Riever, Berks; Ivinghoe, Bucks; Stansteadbury, Herts; Ledbury, Hereford, DRUCE.

423/64. T. KJELLMANII D. Byfleet, Surrey, DRUCE.

423/72. T. LONGISQUAMEUM Lindb. Railway by Notley, Bucks; Kingsey, Oxon, DRUCE.

423/78. T. PERLACINIATUM D. Byfleet, Surrey; Old Marston, Oxon, as forma; a strict form, Northleigh, Oxon, DRUCE.

423/80. T. POLYODON D. Avonmouth, W. Gloster, a small form, Miss I. M. ROPER; Ivinghoe, Bucks, DRUCE.

423/83. T. SEMIPRIVUM D. Yardley Gobion, Northants, DRUCE.

423/83(2). T. SILESIANUM D. Husinish, Harris (modif.), DRUCE.

423/84(2). T. STENACRUM D. Ventnor, Isle of Wight, DRUCE.

423/84(3). T. STENOGLOSSUM D. Byfleet, Surrey; The Parks, Oxford, DRUCE.

423/84(6). T. SUBLAETICOLOR D. Yarnton, Oxon, DRUCE.

423/88. T. UNGUILOBUM D. Ganavan, Argyll, Mrs MACALISTER HALL.

427/3. SONCHUS ASPER Hill, var. INTEGRIFOLIUS Lej. Trewsbury, Gloster; Barnstable, N. Devon; Burton-on-Trent, Derby, DRUCE; Spital, Derby, E. DRABBLE.

Var. PUNGENS Bisch. Trewsbury, Gloster, DRUCE.

427/4. S. OLERACEUS L., var. TRIANGULARIS Wallr. Spital, Derby, E. DRABBLE; Market Harborough, Leicester; Trewsbury, Gloster, DRUCE.

Var. CILIATUS (Lam.) Dr. Rack Wick, Hoy, 1928 [4032], JOHNSTON.

Var. INTEGRIFOLIUS Wallr. Lant Lane, Tansley, Derby, E. DRABBLE.

428/1. TRAGOPOGON PORRIFOLIUS × PRATENSIS, var. MINOR. Waste ground, Yarmouth, E. Norfolk, with both parents. Some of the hybrids produced seeds, which have been sown, E. A. ELLIS.

†431/4. LOBELIA DEBILIS L. f. Waste place, Beaulieu, S. Hants, GRIERSON.

†431/5. L. NATALENSIS A. DC. Martin Mere, S. Lancs, A. G. LANGDON and HOLDER.

432/1. JASIONE MONTANA L., var. appr. LITTORALIS Fries. South portion of Yell, Zetland, S. R. DOUGLAS.

435/3. CAMPANULA TRACHELIUM L., var. URTICIFOLIA Lej. & Court., teste Fraser. Mells, N. Somerset. The leaves are narrower and more sharply cut than the common plant, DRUCE.

†435/4. C. RAPUNCULOIDES L. In sainfoin near High Down, Herts, LITTLE; Lathkil Dale, Derby, E. DRABBLE.

†435/6. C. PERSICIFOLIA L. From a rough pasture near the Golf Links, Budleigh Salterton, S. Devon, flowering very freely, Major ORME.

436/2. LEGOUSIA SPECULUM-VENERIS (L.) Fisch. Near Brandon, Norfolk, Miss DRUMMOND.

438/2. ×VACCINIUM INTERMEDIUM Ruthe. East Moor, Derby, seen there for more than 15 years, but it does not form fruit, E. DRABBLE.

439/1. OXYCOCCUS OXYCOCCUS (L.). Dunkery Beacon, S. Somerset, Major ORME.

446/7. ERICA VAGANS L., var. KEVERNENSIS Turrill. Lizard Down, Cornwall, 1929, R. KEMPTHORNE.

456/1. HYPOPITYS HYPOPITYS (L.) Dr. Sledmere, E. Yorks, Miss E. M. MOREHOUSE in *N.W. Nat.*, 24, 1929.

†462/1. CYCLAMEN HEDERIFOLIUM Ait. Roadside, Pennington, S. Hants, RAYNER; two plants (adventive) on a wild part of Cerby Moor,

860 feet, A. W. BARTLETT in *Vasculum*, 1928. Another result of the teaching of Mr Hewlett and other weak members of his cult.

463/1. LYSIMACHIA THYRSIFLORA L. Sent by Miss VIOLET WILLAN. who found it in great quantity on the edge of a pond at Burley Ringwood, S. Hants. Although the occupiers of the Manor have lived there many years, they know it has not been planted there in their time. It may be rememberd that it also grows round the ornamental waters at Bulstrode, Bucks, but there we have evidence that it was introduced by the Duchess of Portland. The flowers in the Hants specimens were remarkable fine.—DRUCE.

†463/3. L. PUNCTATA L. Quite naturalised at Court-yr-Ala, Glamorgan, Miss VACHELL.

†467/2. ANAGALLIS ARVENSIS L. Flower-border, Brough Lodge, Fetlar, Zetland, JOHNSTON.

473/2. VINCA MINOR L. Lake Woodford, Wilts; Ammanford, Carmarthen, WEBB.

478/1. CENTAURIUM CENTAURIUM (L.) Dr. Braunton, N. Devon, DRUCE. No personal authority in *Top. Bot.*

Var. ELLIPTICUM Druce. Ainsdale Dunes, S. Lancs, HOLDER.

478/4. C. PULCHELLUM Druce. Braunton Burrows, N. Devon, September 1929, DRUCE.

480/4. GENTIANA AMARELLA L., var. MULTICAULIS (Lange) Druce. On Braunton Burrows, N. Devon, September 1929. Growing in almost globular tufts of dense, dark purple flowers, DRUCE.

480/5. G. SEPTENTRIONALIS Druce. Tresta, Fetlar, Mo Ness, Orkney [4252], JOHNSTON in *Trans. Bot. Soc. Edin.*

480/9. G. CAMPESTRIS L., with var. ALBA. Woody Bay, N. Devon, 1929, DRUCE.

Var. BALTICA (Murb.). Braunton Burrows, N. Devon, DRUCE. It has been reported from about Morthoe, etc., Devon, by Miss C. E. LARTER.

†485/2. GILIA CAPITATA Sims. Aldridge Station, Staffs, CURTIS.

†486/1. POLEMONIUM CAERULEUM L. Alder plantation near Weir, between Tonbridge and Penshurst, Kent, 1879 (? seed, water borne), LITTLE.

†488/4. PHACELIA TANACETIFOLIA Benth. Burton-on-Trent, Staffs, 1929, DRUCE.

†490/2. OMPHALODES OMPHALODES (L.) Druce. In great quantity (acres) in a wood near Treiorwerth, Holyhead, Lady KATHLEEN STANLEY.

†493/3. LAPPULA LAPPULA (L.) Dr. Burton-on-Trent, Staffs; Didcot, Berks; South Molton Railway, N. Devon, DRUCE; Worcester, CARLETON REA.

†494/1. ASPERUGO PROCUMBENS L. Cherry Hinton, Cambs, Hon. Mrs ADEANE; Splott, Cardiff, Glamorgan, R. L. SMITH.

†496/2. BENTHAMIA (AMSINCKIA) LYCOPSIOIDES Lehm. Horsey Mere, Norfolk, A. W. G. ALSTON.

†496/4. B. INTERMEDIA (F. & M.) Dr. Burton-on-Trent, Staffs, DRUCE.

†496/5. B. MENZIESII (Lehm.) Dr. Cornfields near Boston, Lincs, 1929, S. J. HURST.

†497/1. SYMPHYTUM OFFICINALE × PEREGRINUM = CAERULEUM Pitm. Ashbourne, Wilts, Miss TODD.

†500/4. ANCHUSA OCHROLEUCA M. Bieb. With 500/2. A. OFFICINALIS L. and 500/7. A. AZUREA Mill, etc. Hayle, Cornwall. Shown to me by Mr REES.

†504/1. ALKANNA LUTEA A. DC. Burton-on-Trent, Staffs, DRUCE.

506/1. MYOSOTIS PALUSTRIS Hill, var. STRIGULOSA Reichb. Evie, Orkney [B.905], JOHNSTON.

†509/2. ECHIUM PLANTAGINEUM L. Pentewan, THURSTON; Helstone, Cornwall, TRESIDDER.

517/1. SOLANUM DULCAMARA L., var. VILLOSISSIMUM Desv. (TOMENTOSUM Koch). Overmoyne, Dorset, Miss TODD, teste Dr POLGAR.

517/2. S. NIGRUM L., ad var. ATRIPLICIFOLIUM vergens. Iver, Bucks, DRUCE, teste Dr POLGAR.

†517/7. S. ROSTRATUM Dunal. Near Bexhill, E. Sussex, Miss ALICE COLE.

517/9. S. TRIFLORUM Nutt. Par, Cornwall, 1927, MEDLIN, teste Dr POLGAR.

517/17. S. SARRACHOIDES Sendt. Avonmouth, W. Gloster, WHITE, as *atriplicifolium*; Dagenham, Essex, 1927, DRUCE and MELVILLE, teste Dr POLGAR.

†518/2. PHYSALIS ANGULATA L. Wool alien, Wymondley, Herts, LITTLE.

*521/1. ATROPA BELLADONNA L. Canal-side, Abercrave, Brecon, C. MARKS.

†525/1. NICOTIANA RUSTICA L. Tiverton, Devon, Col. WATTS.

†527/1. VERBASCUM PHLOMOIDES L. Purwell-field, Hitchin, Herts, LITTLE, teste FRASER. This has been named *V. longifolia* at Kew.

†527/11. V. SINUATUM L. Waste ground near Hayle, W. Cornwall, DRUCE.

†527/12. V. SPECIOSUM Schrad. Burton-on-Trent, Staffs, DRUCE.

†528/1. CELSIA CRETICA L. Owslebury, S. Hants, RAYNER.

532/1. LINARIA LINARIA (L.) Karst., var. LATIFOLIA (Bab.) Dr. Exmouth, S. Devon, Major ORME, *in litt.*
×REPENS. Tintern, Monmouth, AMHERST.

†532/10. L. DALMATICA Mill. Birkdale Sandhills, S. Lancs, J. D. MASSEY and W. G. TRAVIS.

532/26. L. CYMBALARIA Mill. Notes on Introduction and Distribution in Scotland, H. BOYD WATT in *Trans. Bot. Soc. Edin.*, 124, 1929. The first Scottish record, T. HOPKIRK, *Flora Glottiana*, 1813, from Bothwell Castle, on the Clyde.

†535/1. SCROPHULARIA VERNALIS L. Wollaton Park, Notts, BULLEY.

535/4. S. NODOSA L., var. BRACTEATA Dr. Giants Causeway, Miss ROPER in *Ir. Nat.*, 166, 1929.

†537/1. MIMULUS GUTTATUS DC. Ditch at Tintern, Monmouth, AMHERST.

†537/2. M. MOSCHATUS Dougl. Pond-side, Tintern, Monmouth, AMHERST; Plymbridge, Devon, in secluded creeks, GAMBIER-PARRY.

†541/2. DIGITALIS GRANDIFLORA Mill. (AMBIGUA Murr.). Railway bank, Shawford, S. Hants, RAYNER.

†542/1. ERINUS ALPINUS L. Berkeley Castle, W. Gloster; Windsor Castle, Berks, spreading well (seeds sown by Lord Stamfordham); limestone rocks along the Leet, Flint, and limestone rocks near Gwrych, Denbigh, DALLMAN in *N.W. Nat.*, 73, 1929. Mr J. D. MASSEY (*N.W. Nat.*, 136, 1929) writes that the Leet specimens of *Erinus* owe their origin to seeds sown there by a resident.

543/4. VERONICA CHAMAEDRYS L., var. LAMIIFOLIA (Hayne) Beck. Culeaze, Dorset, DRUCE; Spital, Derby, E. DRABBLE.

543/6. V. SCUTELLATA L., var. VILLOSA Schum. Trelleck, Monmouth, with the type, AMHERST.

(VERONICAS named by C. E. Britton.)

543/8. V. ANAGALLIS-AQUATICA L. Mells, N. Somerset, DRUCE.

Var. DIVARICATA (Kroesche). Wolvercote, Wendlebury, Oxon, DRUCE.

Var. AMBIGUA (Kroesche). Ballyvaughan, Co. Clare; Tenby, Pembroke, Miss TODD; Lechlade, Gloster; Southport, S. Lancs, DRUCE.

Var. (state) ULVACEA Hausm. Isle of Wight, F. STRATTON in *Hb. Druce*.

543/9. V. AQUATICA Bernh. Braunton, N. Devon; Burnham, N. Somerset; Binsey, Oxon, DRUCE.

543/18. V. TOURNEFORTII Gmel. (PERSICA), var. CORRENSIANA (E. Lehm.). Swaythling, S. Hants, RAYNER; Dunbar, Haddington, Miss TODD; Braunton, N. Devon; Highbridge, N. Somerset; Henley, Oxon; Byfleet, Surrey; Riever, N. Wilts; St Anne's, N. Lancs; Helstone, W. Cornwall; Burton-on-Trent, Derby, DRUCE; Hook, Surrey [3463], BRITTON.

543/20. V. DIDYMA Ten. (POLITA Fr.), var. THELLUNGIANA (Lehm.). Towersey, Bucks, MASON.

†543/22. V. LONGIFOLIA L. Waste ground, Grandpont, Oxon, 1929, DRUCE.

545/2. EUPHRASIA BOREALIS Wetts. Specimens labelled *minima* from Northdale, Fetlar, Zetland [321], LUMB suggests are *borealis*, as are others from the same place labelled *scotica* [355] and *minima* [4242] from Runcat Gill, Hoy, Orkney, all gathered by JOHNSTON.

Var. PUBESCENS Towns. Fetlar, Zetland, JOHNSTON.

545/3. E. BREVIPILA B. & G. Co. Clare, P. B. O'KELLY.

545/5. E. NEMOROSA Pers. Braunton, N. Devon, practically glabrous leaf surface, marginal setae few; Binsey, Oxon, DRUCE.

545/16. E. SCOTICA Wettst. Ward Hill, Hoy, Orkney; Corbie Head, Fetlar, Zetland [342], JOHNSTON.

545/19. E. ROSTKOVIANA Hayne was growing abundantly on heathy land of the Sussex Weald at Ebernoe, and in less quantity in a field nearer (W.) Parkhurst House. As I have quite failed to find it in the Iver district of N. Herts, the thought suggests itself that as I have never seen it on chalk, here or elsewhere, the explanation may be that it has a preference for more acid soils. I do not, however, remember to have seen developed anywhere the question of soil-preferences for the microspecies of *Euphrasia*. *E. nemorosa* grows indifferently upon chalk or

weald, basic or acid, LITTLE; Trelleck Bog, Monmouth, AMHERST; Kings Nympton, N. Devon, DRUCE.

545/20. E. VIGURSII Davey, var. PALLENS Buckn. Ventongimps, Cornwall, RILSTONE, ex THURSTON. New to England.

545/21. E. KERNERI Wettst. South Molton, N. Devon, DRUCE; Offley, Herts, HUGH PHILIPS.

548/6. RHINANTHUS MONTICOLA (Stern.) Dr. Tresta, Fetlar, Zetland, 1929, JOHNSTON; probably this at Blackhead, Co. Clare, 1928, DRUCE.

549/4. MELAMPYRUM PRATENSE L., var. HIANS Druce. Woody Bay, N. Devon, DRUCE.

550/4. OROBANCHE MAJOR L., var. CITRINA Druce. Biddesden, S. Wilts, DRUCE.

550/10. O. MINOR Sm. (probably). On Japanese Primula, Cardiff, Glamorgan, Miss VACHELL.

553/1. PINGUICULA GRANDIFLORA × VULGARIS = SCULLYI Druce. Near Muckross, Co. Kerry, W. D. MILLER.

*553/2. P. VULGARIS L., ? var. ALPICOLA Reichb. Miss HILDA SALMON reports that she saw on Macleod's Tables, Skye, a large-flowered *Pinguicula* which at first she thought was *grandiflora*, but the capsule was the same as *vulgaris*. "The flowers were larger and flatter, and had a large white blotch in the throat." Unfortunately no specimen was kept, but the description recalls the plant I got in W. Ross which I identified as above, DRUCE.

†555/1. LIPPIA NODIFLORA Michx. Near Southport, S. Lancs, ex Mrs FOGGITT.

556/1. VERBENA OFFICINALIS L. Side of Wye, Tintern, Monmouth, AMHERST.

558/1. MENTHA ROTUNDIFOLIA Huds. On a "tip," Southport, S. Lancs, HOLDER and WAGSTAFFE.

†558/4. M. SPICATA L. Beaulieu, S. Hants, H. PHILIPS.

558/6. M. PIPERITA L. Fyvie, N. Aberdeen, Rev. F. TURREFF; *Inverary, Argyll, WEBB.

Var. SUBCORDATA Fraser. Glasbury, Radnor, 1929, DRUCE.

558/7. M. AQUATICA L., var. MAJOR Sole. Watford, Northants; Castle Howard, Yorks; Three Cocks, Radnor (f. CANA, teste FRASER), DRUCE; Foxcote, E. Gloster, L. ABELL.

Var. ACUTA Briq. Aberthin, Glamorgan, DRUCE.

558/9. M. VERTICILLATA L., var. RIVALIS Briq. Skipwith, Yorks, DRUCE.
Var. OVALIFOLIA (Opiz) Briq. Glen Prosen, Angus, DRUCE.

558/12. ×M. RUBRA Sm. Ascot, Berks, DRUCE.

558/13. M. ARVENSIS L., f. HIRTIPES, teste FRASER. Thrupp, Oxon; Beauly, S. Hants, DRUCE.
Var. NUMMULARIA (Schreb.). Byfield, Northants, DRUCE.

559/1. LYCOPUS EUROPAEUS L., var. GLABRESCENS Schmideley. Boughrood, Radnor, DRUCE.

(THYMUS.—Determined by Dr K. Ronniger.)

561/1. THYMUS PULEGIOIDES L. Stow Wood, Oxon; Harleston, Northants, DRUCE.

561/2. T. GLABER Mill. (CHAMAEDRYS Fr.). Stow Wood, Oxon, DRUCE.
Forma GRACILICAULIS Ronniger. Frilford Golf Course, Berks; Pool Bottom, Oxon, DRUCE.

561/4. T. SERPYLLUM L., f. ERICOIDES W. & G. High Force, Durham, DRUCE.

561/8. T. DRUCEI Ronn. Inchdowrie, Angus, DRUCE.

561/10. T. NEGLECTUS Ronn. Newtimber, Sussex, DRUCE.

561/11. T. BRITANNICUS Ronn. Braunton, N. Devon; Porne, Cheddar, N. Somerset; Blackland, N. Wilts; Scotney, N. Hants; Pool Bottom, Oxon; Sapperton, E. Gloster, DRUCE; Portrush, Antrim, Miss I. M. ROPER in *Ir. Nat.*, 167, 1929.

†562/2. SATUREIA MONTANA L. Medina, Isle of Wight, LONG.

†565/1. MELISSA OFFICINALIS L. Between Tonbridge and Yalding, near the River Medway, Kent, 1879, recorded as *Melittis*, LITTLE.

†566/7. SALVIA AETHIOPIS L. St Agnes, Cornwall, THURSTON.

†566/15. S. HORMINUM L. Hightown, S. Lancs, J. D. MASSEY.

569/1. NEPETA CATARIA L. Braunton, N. Devon, DRUCE. Personal authority needed in *Top. Bot.*

†570/3. DRACOCEPHALUM PARVIFLORUM Nuttall. Burton-on-Trent, Staffs, July 1929, DRUCE; Clitheroe, Lancs, J. FRANKLAND.

†571/2. LALLEMANTIA IBERICA F. & M. Burton-on-Trent, Staffs, DRUCE and CURTIS.

†575/1. SIDERITIS MONTANA L. Burton-on-Trent, Staffs, DRUCE.

576/1. MARRUBIUM VULGARE L. Rhosilly, Glamorgan, Hon. Mrs A. LEITH.

577/4. STACHYS AMBIGUA Sm. Field near Parkhurst House, W. Sussex, 1929, LITTLE, confirmed by DRABBLE.

577/13. S. OFFICINALIS (L.) Trevis. I wish to report the occurrence of an abnormal strain which has obtained a fairly firm hold on a bank for 100 yards or more. The fundamental tendency is towards a three-symmetric form. Three leaves at each node, hexagonal stem, leaf system decussate.

The following forms intermediate between the symmetrical form and the type occur as well:—(1) Two of the leaves at a node smaller than the third. (2) One of the leaves at a two-node deeply bifid. (3) Above a normal two-node occurs a pseudonode, with a single leaf and a flower in the axis. The stem is bent at the pseudonode. It is not an artefact due to the other leaf being torn off. Specimens could be sent to anyone interested.—R. KEMPTHORNE.

578/1. GALEOPSIS SPECIOSA Mill. Castle Sheriff, York, with Mr and Mrs FOGGITT, August 1929, DRUCE; Nant Einion, Llanwrddyn, Montgomery, Major ORME.

578/4. G. LADANUM L., var. CANESCENS auct. = SERICEA Dr. Barry, Glamorgan, Miss VACHELL.

†581/2. LAMIUM MACULATUM L. On a grassy bank near the Three Cocks, Radnor, DRUCE. This is the plant from Goodleigh, N. Devon, recorded in *Journ. Bot.*, 150, 1929, as *molluccellifolium*. That *maculatum* and not *amplexicaule* or *hybridum* was the plant observed shows what glaring mistakes can be made.

581/3. L. PURPUREUM L., near var. LUMBII Dr. Isle of Wight, LONG.

581/4. L. HYBRIDUM Vill., var. DECIPIENS Sonder. Newcastle, Co. Down, Miss I. M. ROPER in *Ir. Nat.*, 168, 1929.

583/1. BALLOTA NIGRA L. Near Clapham, Yorks. First record from this part of Yorks, J. FRANKLAND.

Var. MOLLISSIMA Druce. Burton-on-Trent, Staffs, 1929, DRUCE.

†587/3. AJUGA GENEVENSIS L. Hayle, W. Cornwall, pointed out by Mr REES. It was in beautiful flower in the grassy dune. The flowering spikes were erect.—DRUCE.

†588/1. PLANTAGO INDICA L. Swanage Gas Works [40], Miss TODD; sea wall, Hook, S. Hants, P. M. HALL.

588/8. P. LANCEOLATA L., var. ELLIPTICA Dr. Sea front, Walton, Penzance, Cornwall, 1929, DRUCE.

Var. ALTISSIMA L. Ascot, Berks, DRUCE.

588/9. P. MEDIA L., var. LANCEOLATIFORMIS Dr. Near Andoversford, E. Gloster, July 1929, DRUCE.

593/4. HERNIARIA CINEREA L. Splott, Cardiff, Glamorgan, R. L. SMITH.

†596/6. AMARANTUS RETROFLEXUS L. Hull, Yorks, WATERFALL, teste AELLEN; Ware, Herts, DRUCE.

†596/11. A. ANGUSTIFOLIUS L. Dagenham, Essex [2712], MELVILLE, teste AELLEN.

600/1. CHENOPODIUM RUBRUM L. Braunton, South Molton, N. Devon, DRUCE.

Var. BLITOIDES Wallr. Disused canal, Derby, A. R. S. PROCTOR; Byfield Reservoir, Northants; Clattercut, Oxon, DRUCE.

Var. SPATHULATUM Rouy. Byfield, Northants; Clattercut, Oxon, DRUCE.

600/4. C. HYBRIDUM L. Croughton, Northants, Hon. Mrs G. BARING and DRUCE.

600/6. C. MURALE L. Beaulieu, S. Hants, GRIERSON.

†600/7. C. OPULIFOLIUM Schrad. Avonmouth, W. Gloster [7], C. SANDWITH and J. GIBBONS.

600/8. C. ALBUM L., var. SUBFICIFOLIUM Murr. Galashiels, Selkirk; Hovingham, N. Yorks; Kennington, Berks; Didcot, Berks (forma FARINOSA); Skipwith, N. Yorks, teste MURR, with var. SERRATIFRONS Murr, DRUCE.

Var. LANCEOLATIFORME Murr. Wellingborough, Northants; Walsall, Staffs; Selkirk; Oxford [7654]; Bradford, Yorks, DRUCE; Acton, Middlesex, *Hb. Druce*, teste AELLEN; Avonmouth, W. Gloster [34], C. SANDWITH and J. GIBBONS.

Var. VIRIDE L. Wrentham, E. Suffolk; Bristol [34], W. Gloster; Dundee, Angus; Oxford; Sark, DRUCE.

Var. PEDUNCULARE Bertol. Hovingham, N. Yorks, August 1929, DRUCE.

Var. PAUCIDENS Murr. Towersey, Bucks, MASON.

Var. BORBASIFORME Murr. Avonmouth, W. Gloster, C. SANDWITH.

Var. PSEUDO-BORBASII Murr. Marston, Oxon; St Neots, Hunts, 1913, DRUCE, teste AELLEN.

Var. SERRATO-SINUATUM Murr. Hovingham, N. Yorks; Highbridge, N. Somerset; Marston, Oxon, DRUCE.

×OPULIFOLIUM, b. PLATANOIDES (Scholz). Burton-on-Trent, Staffs; Hovingham, N. Yorks, DRUCE.

×ZSCHACKEI = SUBCUNEATUM Murr. Par, Cornwall; Billingshurst, Sussex; Pyrford, Surrey; Rugeley, Staffs; Dingley, Northants; Colchester, N. Essex; North Berwick, Haddington; Botley, Oxon, DRUCE, teste AELLEN.

†600/9. C. BORBASII Murr. Colchester, N. Essex, BROWN; Burton-on-Trent, Staffs; Galashiels, Selkirk, DRUCE.

†600/11. C. LEPTOPHYLLUM (Nutt.) Brit. Spital, Derby, DRABBLE.

600/12. C. FICIFOLIUM Sm. Avonmouth, W. Gloster [21], C. SANDWITH.

Var. MICROPHYLLUM Murr. Farmyard, Clapton Court, N. Somerset, WHITE.

†600/13. C. GLAUCUM L. Cresswell, Northumberland, 1887, H. E. FOX, as *Pseudo-Botryodes*.

†600/19. C. BOTRYS L. Calow, Derby, DRABBLE.

†600/21. C. HIRCINUM Schrad., var. DIMINUTUM Ludwg. Avonmouth, W. Gloster, C. SANDWITH and J. GIBBONS; Byfleet, Surrey, August 1918, DRUCE, teste AELLEN.

†600/23. C. BERLANDIERI Moq., var. PLATYPHYLLUM Issler. Symonds Yat, W. Gloster, September 1929, DRUCE, teste MURR.

†600/24. C. ZSCHACKEI Murr, sub-sp. BERLANDIERI Murr. Southport, S. Lancs, J. D. MASSEY; Avonmouth, W. Gloster [8], C. SANDWITH; Skipwith, N. Yorks; Ware, Herts; Billingshurst, Sussex; Par, Cornwall, 1909; Southport, S. Lancs; Botley, Oxon, DRUCE.

†600/30. C. QUINOA Willd. Selkirk [1175] and Galashields, DRUCE and Miss I. M. HAYWARD, teste AELLEN.

606/3. ATRIPLEX PATULA L., var. BRACTEATA Westerl. Reservoir, Clattercut, Oxon; Byfield, Northants, DRUCE; Launcells, N. Cornwall, MASON; Witley, Surrey, GERALD ASH.

606/6. A. DELTOIDEA Bab. Bagshot, Wilts, Miss TODD.

†607/1. AXYRIS AMARANTOIDES L. Hovingham, N. Yorks, DRUCE.

†613/1. SALSOLA KALI L. Near Raynes Park, Surrey, BRITTON.

Var. TRAGUS (L.). Ascot, Berks, October 1929, DRUCE and Lady DAVY.

615/2. POLYGONUM CONVOLVULUS L., var. SUBALATUM Lej. & Court. Kings Nympton, N. Devon, DRUCE.

615/3. P. BISTORTA L. Not native, Millfield, Newburgh, Stromness, Orkney [394], JOHNSTON.

615/7. P. PERSICARIA L., var. MACULIS-INSIGNIS Danser. Clattercut, Oxon; Byfield, Northants, DRUCE.

Var. ELATUM Gren. & Godr. Clattercut, Oxon; Byfield, Northants, DRUCE.

615/10. P. MITE Schrank. Canal near Chesterfield, Derby, DRABBLE.

†615/31. P. POLYSTACHYUM Wallich. In great abundance near Woody Bay, and in many places along the railway from Barnstable to Lynton, N. Devon, thoroughly established and spreading, DRUCE.

†615/32. P. CUSPIDATUM Sieb. & Zucc. Near Pimlico, Clitheroe, Lancs, J. FRANKLAND; Barnstable, N. Devon, DRUCE.

†615/33. P. SACHALINENSE Schmidt. Countess Wear, D'URBAN in *Devon Tr.*, 93, 1929.

618/6. RUMEX OBTUSIFOLIUS × PULCHER = OGULINENSIS Borbas. West Tofts, Norfolk, LITTLE. Sp. non vidi.

618/13. R. MARITIMUS L. In immense quantity in its old habitat at Binsey, Oxon, from which it had almost disappeared. It was also plentiful at Skipwith, Yorks, and at Boarstall, Bucks, DRUCE.

†618/17. R. SCUTATUS L. Limestone walls at Allithwaite Lake, Lancs, WEBB.

†618/19. R. SALICIFOLIUS Weinm. Didcot, Berks; Burton-on-Trent, Staffs, 1929, DRUCE.

†618/20. R. PATIENTIA L. Burton-on-Trent, Staffs, DRUCE and CURTIS.

†618/24. R. CUNEIFOLIUS Campd. Braunton Burrows, N. Devon, Dr WRIGHT, ex W. D. MILLER.

†618/29. R. OBOVATUS Danser. Sandpits, Ham, Surrey, 1929, Mrs WEDGWOOD.

†618/29(2). R. PARAGUAYENSIS Parodi. Alien, Brackenbridge, near Glasgow, Lanark, GRIERSON. "More like *paraguayensis* than *obovatus*." —DANSER.

*621/1. ASARUM EUROPAEUM L. Merrilands Farm, Corscombe, near Evershot, Dorset, C. J. TROYLE-BULLOCK, *in litt.* Found by a schoolgirl.

†622/2. ARISTOLOCHIA ROTUNDA L. Still flowering in Surrey, H. J. BURKILL.

623/2. DAPHNE MEZEREUM L. Bramdean Common, Hants, Hon. Mrs CHAPMAN, ex RAYNER.

626/1. VISCUM ALBUM L., on *Morus alba*. In a garden near Ross, Hereford, Miss ARMITAGE in *Journ. Bot.*, 283, 1929. On *Populus* at Cranborne, Dorset, and Wilts.

†628/9. EUPHORBIA VIRGATA W. & K. Morn Hill, Winchester, Hants, Miss WHALE, ex RAYNER; Sacombe, Herts, LITTLE.

633/4. ULMUS PLOTII Druce. There is at Albury, E. Herts, and again at Furneux Pelham and Little Hormead, a good deal of what I believe is *U. Plotii*. The region is poor boulder clay. On boulder clay at Ettisley, Cambs, in the spring, I saw trees with neither flower nor leaf which, by their fine branching, I suspect were the same. As they were in a wood, the latter might be a natural station.—LITTLE.

†634/1. HUMULUS LUPULUS L. Barren specimen in grassy ditch-side, Firth, Orkney, JOHNSTON in *Trans. Bot. Soc. Edin.*

†635/1. CANNABIS SATIVA L. St Peter's Port, Guernsey, 1929, Mrs HICHENS.

637/1. URTICA DIOICA L., var. HOLOSERICEA Fries, or near it. Tarbert, Harris, 1928, DRUCE.

†639/1. HELXINE SOLEIROLII Req. Haslemere, Surrey, growing under a holly hedge, Miss M. DRUMMOND.

644/1. CARPINUS BETULUS L. Alburgh, Norfolk, MASON.

646/2. QUERCUS SESSILIFLORA Salisb. Tintern, Monmouth, AMHERST; Woody Bay, N. Devon, DRUCE.

†650/2. SALIX FRAGILIS L. Planted specimens at Redland Burn, Firth, Orkney, JOHNSTON in *Trans. Bot. Soc. Edin.*

(SALICES named by J. Fraser.)

650/3. S. ALBA L., var. STENOPHYLLA Fraser. Weston-super-Mare, N. Somerset, DRUCE.

Var. CAERULEA (Sm.). Andoversford, E. Gloster, L. ABELL; Trewsbury, E. Gloster, DRUCE.

×FRAGILIS = VIRIDIS Fries. Kidlington, Oxon, DRUCE.

650/5. S. PURPUREA L., f. HELIX (Sm.). Bulwell, Notts, BULLEY.

650/8. S. CAPREA × CINEREA = REICHARDTII A. Kern. Pegal Burn, Orkney, JOHNSTON in *Trans. Bot. Soc. Edin.*

×VIMINALIS = MOLLISSIMA Sm. (non Willd.). Oxford Parks, DRUCE; Redland, Orkney, planted, JOHNSTON in *Trans. Bot. Soc. Edin.*

650/9. S. AURITA × CINEREA = S. LUTESCENS A. Kern. Weston-super-Mare, N. Somerset, DRUCE.

×CAPREA = CAPREOLA J. Kern. Weston-super-Mare, N. Somerset, DRUCE.

×PHYLICIFOLIA = LUDIFICANS F. B. W. Burn of Dullant, Fetlar, Zetland, a planted shrub, JOHNSTON.

×REPENS=AMBIGUA (Ehrh). Hoy, Orkney [3958 and 3808], JOHNSTON.

×REPENS, f. INCUBACEA (L.). Cava, Orkney [3948], JOHNSTON.

×VIMINALIS = FRUTICOSA Döll. Peakirk, Northants, DRUCE; †Layland, Orkney, a single plant, not native, JOHNSTON.

650/10. S. CINEREA L., var. OLEIFOLIA (Sm.). Tyndrum, Mid-Perth, DRUCE; Redland Burn, Firth, Orkney, JOHNSTON.

650/11. S. REPENS L., var. INCUBACEA (L.). Bank of Quoys, Hoy, Orkney, 1928 [3821], JOHNSTON.

Forma LEIOCARPA. Cava, Orkney, JOHNSTON.

650/13. S. PHYLICIFOLIA × REPENS = SCHRADERIANA Willd. Birsay, Orkney [4217], JOHNSTON.

651/3. POPULUS NIGRA L. Castle Howard, Yorks, DRUCE.

663/2. LISTERA CORDATA (L.) Br. Brockenhurst, S. Hants, R. FINDLAY. See *Gard. Chron.*, 164, 1929.

664/1. SPIRANTHES AESTIVALIS (Lam.) Rich. Six plants, five of which were flowering, were seen in the "old" station on July 28. These were actually in a part of the bog in which I had not previously seen the plant. On August 6, thirty-five plants, all in flower but two, were seen in the "new" station. A total of 41 plants leads one to hope that this plant is in better care than Mr Rayner's *Supplement to the Hampshire Flora* might suggest. The plants in the "new" station were particularly luxuriant and more healthy in appearance than those in the "old" station, P. M. HALL.

667/3. CEPHALANTHERA LONGIFOLIA (Huds.) Fritsch. Glenasmae, Co. Dublin, A. W. STELFOX in *Ir. Nat.*, 247, 1929.

668/4. HELLEBORINE PURPURATA (Sm.) Dr. Near Folkestone, Kent, H. WALKER.

669/7. ORCHIS INCARNATA L., var. PULCHRIOR Druce. Sapcote, Leicester, BEMROSE.

×PURPURELLA. Hewing Firth, Pomona, Orkney, JOHNSTON.

669/8. O. PRAETERMISSA Druce. The droughty year was very inimicable to this orchid which was either very small or non-existent in its

accustomed habitats. Walworth, Herts, 1838, *Hb. Luton*; Weston-super-Mare, N. Somerset, DRUCE; Rammey Marsh, Middlesex [3475], BRITTON.

Var. PULCHELLA Druce. On a hill above Barmouth, Merioneth, 400 ft. alt., CHESTER, growing with *O. maculata* and *Habenaria virescens*; Giant's Causeway, Antrim, J. LAMB.

669/10. O. MACULATA L. Barmouth, Merioneth, CHESTER; Ballyvaughan, Co. Clare, O'KELLY; Bodmin Moor, Cornwall, THURSTON.

669/11. O. FUCHSII Druce, forma PURPUREA. Ballyvaughan, Co. Clare, O'KELLY; Hitchin, Herts, 1838, *Hb. Luton*.

*669/18. O. HIRCINA Crantz. One plant near Salmonby, N. Lincoln, found by Miss JOAN GIBBONS in June 1929. A welcome New County Record. I saw it in N. Somerset this year, DRUCE.

672/4. OPHRYS TROLLII Heg. & Heer. Caesar's Camp, near Folkestone, E. Kent, H. WALKER, but not a good example as the second and third flowers were almost devoid of a lip.

672/5. O. MUSCIFERA Huds. A plant of this was found by Sir ARTHUR HORT and his son in the Hanger Wood, Hurstbourne Tarrant, Hants. It measured 26½ inches high, had ten flowers, eight of which were out, and two in bud.

674/1. HABENARIA GYMNADENIA Druce, var. ALBIFLORA. Caesar's Camp, near Folkestone, E. Kent, H. WALKER.

674/4. H. VIRIDIS (L.) Br., var. VAILLANTII (Ten.) Fernald. Goathland, Yorks, FLINTOFF; Limbury, Beds, 1833, *Hb. Luton*.

674/6. H. VIRESCENS Druce. A specimen, with 50 flowers, found in a wood near Broadway, Gloster, Miss MILVAIN in *Wild Fl. Mag.*

674/7. H. BIFOLIA (L.) Br. Asham Wood, Mells, N. Somerset, DRUCE.

678/1. CROCUS NUDIFLORUS Sm. Still exists in the classic locality near Warwick where Mr BOLTON KING showed it me. Two specimens were found by Mr E. PAYNE in †Sussex in October 1929.

678/2. C. VERNUS (L.) All. In a meadow at Ash, Kent, C. BAKER.

†683/1. TRITONIA CROCOSMIFLORA Nich. Woody Bay, etc., naturalised in several places about Lynmouth, N. Devon, DRUCE; Newcastle, Co. Down, J. LAMB.

†684/1. NARCISSUS LOBULARIS Haworth. Plentiful, Whitland, Carmarthen, WEBB.

†684/3. N. BIFLORUS Curtis. Heath, Beds, 1929, DRUCE; hundreds of plants near Red Wharf Bay, Anglesey, Hon. Mrs GUY BARING; Copeland Islands, at Donaghadee, Co. Down, F. STOREY.

684/4. N. POETICUS L. In the dunes near Hayle, Cornwall, DRUCE.

684/8. N. BARRII Hort. (N. INCOMPARABILIS × POETICUS). Field near Marston, Berks, a relic of cultivation, DRUCE.

691/2. POLYGONATUM MULTIFLORUM (L.) All. Penniwinkle Thaw, near Leigh, Kent, 1879, LITTLE, and specimen in Herb.

†698/2. ASPHODELUS TENUIFOLIUS Cav. Saltney, Flint, J. P. D. THOMAS; by the railway, South Molton, N. Devon; Didcot, Berks; Burton-on-Trent, Staffs, DRUCE. Mr DALLMAN (*N.W. Nat.*, 194, 1929) records *A. fistulosus* from a garden at Adwick-on-Dearne, S.W. Yorks, found by Miss E. CRAMPHORN, introduced with fowl corn. Is it certain that the plant is not *tenuifolius*?

702/3. ALLIUM SCORODOPRASUM L. Grange-over-Sands, Lancs, A. TURNER.

702/4. A. VINEALE L., var. BULBIFERUM Syme. Falmouth, Cornwall, TRESIDDER, ex THURSTON.

†704/1. HYACINTHUS COMOSUS L. Langton Matravers, Dorset, ex Hon. Mrs G. BARING; Ainsdale Dunes, S. Lancs, HOLDER and WAGSTAFFE; near Derby, A. R. S. PROCTOR.

†708/2. LILIUM PYRENAICUM Gouan. Fruiting freely in its classic habitat, N. Devon, in September last. A fasciated example was also seen, DRUCE.

709/1. FRITILLARIA MELEAGRIS L. Alburgh, Norfolk; Homersfield, Suffolk, MASON.

†718/16. JUNCUS TENUIS Willd. Plymbridge, S. Devon, GAMBIER-PARRY.

718/23. J. TRIFIDUS L. Cul Beag, W. Ross, alt. 2523 feet, Hon. Mrs CAMPBELL.

719/1. JUNCOIDES SYLVATICUM (Huds.) Dr., var. GRACILE (Rostr.) Groves. Tintern, Monmouth, AMHERST.

*†719/9. J. NEMOROSUM Morong, var. RUBELLUM (Hoppe) Dr. Balnaboth, Angus, in considerable quantity about the Lodge, DRUCE. Specimens are distributed.

721/1. TYPHA LATIFOLIA L. Braunton, N. Devon, DRUCE.

721/2. T. ANGUSTIFOLIA L. Abundant and fruiting freely by the canal, Market Harborough, Leicester, DRUCE.

722/1. SPARGANIUM NEGLECTUM Beeby [813] and fruits. "I send you specimens which represent our common plant. I cannot find *polyedrum* in this [Hertfordshire] district. You will see that the bases of the leaves are white—those in running water. In Purwell old mill lead, now silted up with 6 feet of mud, I got specimens with pink base to leaves, but they do not appear to be separable on that difference. I think Towndrow's note (*Rep. B.E.C.* 319, 1927) does not work. Drabble thought some of the pink-based ones might be *microcarpum* (with smaller fruits). The leaves of 813 are not conspicuously broad. Towndrow's remark that they are broader in *microcarpum* does not agree with Ascherson & Graebner who say that *microcarpum* is ' smaller in all its parts ' than *neglectum*. And they add—" *S. neglectum* not infrequently bears fruiting heads (especially late blooms) whose fruits in no way differ from *microcarpum*.' "—J. E. LITTLE.

722/1. S. NEGLECTUM Beeby. Ippolyts Brook, Hitchin, Herts, LITTLE; Canal, Market Harborough, Leicester, DRUCE.

†724/1. ACORUS CALAMUS L. Flowering at Castle Howard, N. Yorks, August 1929, DRUCE.

727/3. LEMNA TRISULCA L. Holy Island, N. Northumberland, J. E. HULL in *Vasculum*, 99, 1928.

737/5. POTAMOGETON ALPINUS Balb., var. PALMERI Druce. Canal, Odiham, N. Hants, DRUCE. Mr ARTHUR BENNETT agreed to its varietal value.

737/11. ×P. NITENS Weber, var. ANGUSTIFOLIUS Ferber. Papil Water, Fetlar, Zetland, JOHNSTON. These leaf-forms of Pondweeds seem scarcely worth naming.

737/14. ×P. DECIPIENS Nolte. Canal, Market Harborough, Leicester, September 1929, DRUCE.

737/16. P. PERFOLIATUS L., var. OBLONGIFOLIUS M. & K. Loch of Une, Fetlar, Zetland, JOHNSTON.

737/28. P. PECTINATUS L. Pulborough, Sussex, Miss COTTES; Braunton, N. Devon, DRUCE.

737/30. P. FILIFORMIS Pers. Papil Water, Fetlar, Zetland, JOHNSTON.

*744/1. CYPERUS LONGUS L. Discovered in a marsh at Ascot, Berks, by the Rev. D. M. HEATH, 1929. I am pretty confident it was not there in the nineties, but since that date the area has been greatly altered by

building operations. This plant grows for a short distance by and about a small stream and is completely naturalised, but I think it is not an indigenous species. It is new to Berkshire.—DRUCE; gully near Red Lodge Nursery, Bassett, S. Hants, PACK, ex RAYNER.

744/2. C. FUSCUS L. This was very plentiful on Dorney Common, Bucks, in 1929, DRUCE.

745/4. ELEOCHARIS ACICULARIS (L.) Br. Moon Green Reservoir, Notts, R. BULLEY.

746/2. SCIRPUS MARITIMUS L., var. CONGLOBATUS S. F. Gray. Braunton, N. Devon, DRUCE.

746/6. S. AMERICANUS Pers. Mr W. G. TRAVIS (*N.W. Nat.*, 175, 1929) says he found this in 1909 but he did not recognise it as that species and mislabelled it.

747/2. ERIOPHORUM ANGUSTIFOLIUM L., var. LONGIFOLIUM Hoppe. Birkdale, S. Lancs, HOLDER and WAGSTAFFE.

*747/3. E. GRACILE Roth. Hornstock, Northants, 1878. I think correctly named, DRUCE.

753/3. CAREX ACUTIFORMIS Ehrh., var. SPADICEA Roth. Between Elstead and Tilford, Surrey, 1899, E. S. MARSHALL, ex C. E. SALMON in *Journ. Bot.*, 336, 1929.

753/4. C. VESICARIA L. Caneston Bridge, Pembroke, Miss TODD.

753/5. C. GRAHAMI Boott. To this Dr Kükenthal assigns the plant sent by P. EWING to the *Wats. B.E.C.*, as *vesicaria*, var. *alpigena* Ewing, non Fries, ex C. E. SALMON in *Journ. Bot.*, 336, 1929.

753/6. C. SAXATILIS L. Ben More, Mid-Perth, 1910 [3481], E. S. MARSHALL. This is Mr Marshall's *Grahami* × *saxatilis*, but Dr Kükenthal fails to find its hybrid origin. That was my idea, and I have queried it in our List. C. E. SALMON, *l.c.*, 336, 1929.

753/7. C. INFLATA Huds. Burn of Funzie, Fetlar, Zetland [305], JOHNSTON.

Var. UTRICULATA (Boott) Dr. Moidart, Argyll, v.-c. 97, 1895, S. MACVICAR. See C. E. SALMON in *Journ. Bot.*, 336, 1929.

×VESICARIA = PANNEWITZIANA Fig. Marsh near River Derwent, N. of Keswick, Cumberland, C. E. SALMON, *l.c.*

753/10. C. PENDULA Huds. Tintern, Monmouth, AMHERST; Churchtown, S. Lancs, HOLDER and WAGSTAFFE.

753/12. C. STRIGOSA Huds. Woodbury, S. Devon, Major ORME; already recorded from Bickington in that vice-county by Miss C. E. LARTER.

753/16. C. SADLERI Linton. Loch Wharral, Clova, Forfar. Referred by Dr Kükenthal to *C. binervis*, var. *alpina* Drejer. C. E. SALMON in *Journ. Bot.*, 335, 1929.

*753/18. C. PUNCTATA Gaud. Aldeburgh, E. Suffolk, K. D. LITTLE; det. J. E. LITTLE.

753/19. C. FULVA × OEDERI. Loch Tummel Side, Mid-Perth, with ×*oedocarpa*, DRUCE; between Herston and Godlingston Farm, Dorset; Flegg Burgh Fen, etc., E. Norfolk, SALMON; Goathland, N.E. Yorks, Miss MENNELL; Aysgarth, N.W. Yorks, 1916, FOGGITT; Newton Regny, Cumberland, WALLIS.

×OEDERI. Bassenthwaite Lake, Cumberland, C. E. SALMON, *l.c.*, 335, 1929.

753/23. C. EXTENSA Good. Southport, S. Lancs, HOLDER and WAGSTAFFE.

*753/31. C. TOMENTOSA L. On the Middlesex side of the River Thames, nearly opposite the Surrey station, I. A. WILLIAMS in *Journ. Bot.*, 59, 1929.

753/33. C. DIVERSICOLOR Cr., var. BULBOSA Drejer. Thorpe Green, Surrey, C. E. SALMON in *Journ. Bot.*, 334, 1929.

753/36. C. PANICEA L. Dr Kükenthal (see *Journ. Bot.*, 335, 1929) says that the plant collected by Marshall near Fort William, 1888, is not *intermedia* Miég. I was of the same opinion, and it is queried in our List. He thinks it is forma HUMILIS Meinsh.

*753/38. C. LIMOSA L. Burn of Funzie, Fetlar, Zetland, JOHNSTON.

753/45. C. ELATA All. St Leonards, E. Sussex, FOX WILSON, ex SALMON in *Journ. Bot.*, 333, 1929.

×GRACILIS = × C. CURTISII Druce in *Rep. B.E.C.*, 887, 1929. Near Thurne, E. Norfolk, 1902; Lizard Down, W. Cornwall, C. E. SALMON, *l.c.*

753/46. C. GRACILIS Curt., var. PROLIXA Fries. Muckhatch Farm, Thorpe, Surrey, C. E. SALMON, *l.c.*

Var. ANGUSTIFOLIA Kük. Marshy wood near the River Wharfe, Ilkley, M.W. Yorks, A. WILSON in *Rep. B.E.C.*, 402, 1908, as *gracilescens*. This name was introduced by Arthur Bennett. In *Rep. B.E.C.*, 426, 1892, he says of certain specimens labelled *gracilis*, var. *gracilescens*, that they closely agree with specimens so named by Almquist. Kükenthal (*l.c.*) refers C. WATERFALL'S specimen sent to *Wats. B.E.C.* from edge of Avon, Tewkesbury, E. Gloster, as *gracilis* towards *prolixa*. The

referees, A. Bennett and E. S. Marshall, said it showed excellent evidence of *acutiformis* × *inflata*. Kükenthal says "certe *non* planta hybrida, sed *C. gracilis*.

753/47. C. AQUATICUS Wahl., var. VIRESCENS Anderss. Derwentwater, Cumberland, 1919, C. E. SALMON, *l.c.*, 334, 1929.

Var. SPHAGNOPHILA Fries. Above Glen Callater, S. Aberdeen, E. S. MARSHALL, 1892. Collected by me from that area in the eighties.

×RIGIDA ? [CONCOLOR]. Athol Forest, E. Perth, 2600 feet, E. S. MARSHALL [3575], who queried it as var. *epigeios*; Meall Odhar, Glas Maol, E. Perth, 2700 ft., SALMON, *l.c.* This is the var. *stans* Boott of my List.

753/49. C. GOODENOWII Gay. Mr C. E. SALMON (*Journ. Bot.*, 334, 1929) cites several formae under this species, and a queried hybrid with *C. gracilis* from marsh, Derwentwater, Cumberland, 1919, and from Llyn Padarn, Carnarvonshire, named by KUKENTHAL. Kükenthal so named several of my sedges from Scotland, etc., where *C. gracilis* is absent. I am inclined to think they come under var. STRICTIFORMIS Bailey. Var. RECTA is cited by C. E. SALMON (*l.c.*) from marsh near Lodore, Cumberland; Hawes Water, Westmorland; near Lewes, E. Sussex, and Loch Wharral, Angus.

753/53. C. LEPORINA L., var. ARGYROLOCHIN Koch. Portadown, Co. Armagh, Miss JEANNE W. WHITE.

753/55. ×C. HELVOLA Blytt. Ben Lawers, Mid-Perth, DRUCE, attested by Dr KUKENTHAL. So far *Lachenalii* has not been recorded for the Breadalbanes.

753/57. ×C. AXILLARIS Good. Between Buckman Corner and Bucks Green, Sussex, with its parents, Lady DAVY.

*753/58. C. CANESCENS L. Portadown, Co. Armagh, Miss JEANNE W. WHITE; Den of Dunkadale, Birsay, Orkney, rare [4219], JOHNSTON, as *echinata*.

Var. ROBUSTIOR Blytt. Mickle Fell, N.W. Yorks, 2400 feet, SALMON in *Journ. Bot.*, 333, 1929.

753/61. C. PAIRAEI F. Schultz. Santon Warren, Norfolk; Tiddenham and Cavenham, Suffolk, LITTLE.

753/62. C. DIVULSA Stokes. Wimbolsham, W. Norfolk, LITTLE, as *divulsa* × *contigua* (?); North Wootton, King's Lynn, Norfolk, C. P. VETCH, ex J. S. GILMOUR.

×REMOTA. Near Mayfield, E. Sussex, C. E. SALMON in *Journ. Bot.*, 140, 1925. Passed by KUKENTHAL, *l.c.*, 333, 1929. This is ×C. EMMAE Gross.

*753/63. C. PANICULATA L. Burn of Funzie, Fetlar, Zetland, JOHNSTON in *Trans. Bot. Soc. Edin.*

†754/6. PANICUM COLONUM L. Bassett, S. Hants, PACK, ex RAYNER.

†754/8. P. CRUS-GALLI L. Yateley, N. Hants, MONCKTON.

758/3. SPARTINA TOWNSENDII Groves. A thousand roots have been planted on the foreshore of Canvey Island, Essex, in order to preserve the shore from erosion, *Gard. Chron.*, 236, 1929.

764/1. ORYZA ORYZOIDES (L.) Brand. Plentiful in a barren state by a stream near Brockenhurst, S. Hants, DRUCE and P. M. HALL.

†766/2. ANTHOXANTHUM ARISTATUM Boiss. Burton-on-Trent, Staffs, DRUCE. Distributed this year.

770/3. ALOPECURUS MYOSUROIDES Huds. South Molton, N. Devon; Aber, Carnarvon; Leith, Midlothian, DRUCE.

770/6. A. AEQUALIS Sobol. In immense quantity on the exposed mud of the reservoirs at Byfield, Northants, and Clattercut, Oxon, DRUCE. Specimens distributed this year.

777/1. PHLEUM PRATENSE L., var. INTERMEDIUM (Jord.). Near Leake, Notts, R. BULLEY.

780/2. AGROSTIS ALBA L., var. MARITIMA Meyer. Burnham, N. Somerset, July 1929, DRUCE.
Var. CONDENSATA Hackel. Balnaboth, Angus, DRUCE.

783/1. CALAMAGROSTIS EPIGEIOS (L.) Roth. By the Tyne near Hexham, Northumberland, Lady ALETHEA BUXTON.

785/1. APERA SPICA-VENTI (L.) Beauv. Burton-on-Trent, Staffs; Skipwith, Yorks, DRUCE; Newport, Isle of Wight, LONG.

790/1. WEINGAERTNERIA CANESCENS (L.) Bernh. See *B.E.C.*, 765, 1928, where it is added to the Lancashire Flora by Mr JUSTICE TALBOT. My friend, Mr F. W. Holder, who knows the country round Southport intimately, and who was for many years engaged in ornithological observations on the dunes, writes to me about the record as follows:— "I had not read the description [of the grass] with care until last week, and I felt sure that the grass was one I had described in my journal years ago, on May 4, 1919. 'On the slopes of one of these [high dunes] I came across a colony of hummocky grass covering a limited area. The grass had the hues of satin, and I cannot recollect another such colony on the dunes. In fact, the grass is of such a nature that the most casual of observers cannot pass without remarking on its unique situation on sandy ground.'" On September 11, 1929, Mr

Holder went straight to the locality and found the *Weingaertneria* just as he had described it ten years before. He found more on the adjacent sandhills. Mr Holder adds:—"I have mentioned this merely to afford evidence that the plant has been established at Formby for years—my note in no way deprives Mr Justice Talbot of a capital first record."

794/1. AVENA FATUA L., var. PILOSISSIMA S. F. Gray. South Molton, N. Devon, DRUCE.

794/2. A. PUBESCENS Huds. Wick of Gruting, Fetlar, Zetland, JOHNSTON.

795/1. ARRHENATHERUM ELATIUS (L.) Mert. & Koch, var. BIARISTATUM (Peterm.) Dr. Lizard, Cornwall, L. B. HALL.

795/2. A. TUBEROSUM (Gilib.) Dr. Tintern, Monmouth, AMHERST.

†808/1. CYNOSURUS ECHINATUS L. Settle, Yorks, J. FRANKLAND.

809/1. KOELERIA GRACILIS Pers. W. Leake, Notts, R. BULLEY.

809/3. K. BRITANNICA (Domin). Budleigh Salterton, S. Devon, Major ORME; Blackland, Wilts, DRUCE.

819/1. DACTYLIS GLOMERATA L., forma VIVIPARA. A curious form is commented on (*Gard. Chron.*, 164) by W. B. TURRILL. It was found by Mr TRESIDDER at Pentewan, Cornwall.

†*824/1. POA CHAIXII Vill. Balnaboth, Angus, 1929, DRUCE.

824/2. P. PRATENSIS L., var. ANGUSTIFOLIA (L.). Railway bank, Winchester, S. Hants, DRUCE.

824/3. P. SUBCAERULEA Sm. Byfleet, Surrey, DRUCE.

†824/5. P. PALUSTRIS L. Southampton, Hants, Miss TODD; Didcot, Berks, DRUCE.

825/3. GLYCERIA PLICATA Fries, var. DECLINATA (Bréb.). Withyham, E. Sussex, Mr JUSTICE TALBOT.

825/4. GLYCERIA DISTANS Wahl. Under *Puccinellia distans*, Mr C. E. SALMON (*Journ. Bot.*, 243, 1929) says that some English specimens from Avonmouth Docks, J. W. WHITE, June 19, 1911, are the true *G. distans*, the Norge botanists keeping the *Poa retroflexa* of Curtis Fl. Lond. vi., t. 1, distinct. *G. distans* has a shorter lower glume, 1.5 mm.; upper, 2 mm. long; whereas in *retroflexa* both glumes are up to 3 mm. long, and they are more acute. He has *retroflexa* from near Ridge, Dorset; Lewes, Frog Firle, Litlington, E. Sussex, C. E. SALMON, and from Hull, S.E. Yorks, C. WATERFALL. Curtis's plate in *Fl. Lond.* lxi., was published before 1791 (not 1797 as given by Mr Salmon), and in the

accompanying text it says he gathered it in 1786, among the grassy herbage on the right-hand side of the horse-road leading up to Hampstead in tolerable plenty. He holds it is a distinct species from *distans*. His drawing of the glume is more like *distans* than *retroflexa*. He says:— "The calyx A glume of two valves, the valves ovate, obtuse, hollow, unequal, one of them not more than half the length of the other.

*825/8. G. PROCUMBENS Dum. By the river about two miles from Stafford (brine baths are near), Mr JUSTICE TALBOT.

826/15. FESTUCA MEMBRANACEA (L.) Dr. Exmouth, S. Devon, Major ORME in *Devon Tr.*

†826/16. F. DANTHONII A. & G. Still at Burton-on-Trent, Staffs, 1929, DRUCE.

826/18. F. MYURUS L. Wareham, Winterborne Steepleton, Dorset; Highbridge, N. Somerset, DRUCE.

827/5. BROMUS MADRITENSIS L. Tenby, Pembroke, Miss TODD.

†827/10. B. MARGINATUS Nees. Dagenham, E. Essex, MELVILLE.

827/16. B. SECALINUS L. Kirby-le-Soken, N. Essex, DRUCE.

*827/19. B. BRITANNICUS I. A. Williams. (B. HORDEACEUS L., var. PSEUDO-RACEMOSUS Dr.). Fyvie, N. Aberdeen, Rev. F. TURREFF, as *pratensis*; Melmerby, Cumberland, MASON, too young for certainty; Killin, Mid-Perth, 1920 FRASER,; Glasgow, 1922, GRIERSON; Basildon, Riever, Berks; near Riever, Wilts; Middleton Park, Oxon; Louth, Lincoln; Culeaze, Dorset, too young for certainty; Erith, Kent; Chalfont, Bucks, 1905, as *leptostachys* Pers.; Wilsford, S. Wilts; Aberdeen, S. Aberdeen, DRUCE.

828/1. BRACHYPODIUM SYLVATICUM (Huds.) R. & S. Hoy, Orkney [4257], JOHNSTON.

828/2. B. PINNATUM (L.) Beauv., var. CORNICULATUM Bréb. Near Ampleforth, Yorks, 1929, DRUCE.

†829/2. LOLIUM TEMULENTUM L. Burton-on-Trent, Staffs, 1929, DRUCE.

830/1. AGROPYRON JUNCEUM Beauv. Burnham, N. Somerset, DRUCE.
Var. MEGASTACHYUM (Fr.) Dr. Coast at Pembroke [17], Miss TODD; Redcar, Yorks, DRUCE.

830/4. A. REPENS L., var. LEERSIANUM S. F. Gray. Wiseman's Bridge, Pembroke, Miss TODD; Woody Bay, N. Devon; Burton-on-Trent, Derby, DRUCE.

†832/8. TRITICUM TRIUNCIALE (L.) Rasp. Burton-on-Trent, Staffs, DRUCE.

840/1. TAXUS BACCATA L. Woody Bay, N. Devon, DRUCE.

*844/1. EQUISETUM MAXIMUM Lam. Ilyon Valley, Radnor, WEBB.

844/2. ×E. LITORALE Kühl. Ballymena, Co. Antrim; Woodstock Demesne, Kilkenny; Friars Island, Limerick; Kilgoblin Castle, Co. Dublin, PRAEGER in *Ir. Nat.*, 191, 1929.

844/5. E. LIMOSUM L. Braunton, N. Devon, DRUCE.

857/4. CYSTOPTERIS FILIX-FRAGILIS (L.) Bernh. On masonry near Goathland, N. Yorks, F. DRUCE, ex R. J. FLINTOFF, who remarks that it is not recorded in District No. 4, the Esk area by J. G. Baker, so that this is the only known station in the Esk area. Probably it owes its origin to wind-blown spores.

858/1. POLYPODIUM VULGARE L., var. SERRATUM Milde. Castle Martyr, Co. Cork, 1928, DRUCE.

862/1. TRICHOMANES RADICANS Sw. Ox Mountain, Sligo, Miss R. L. PRAEGER in *Ir. Nat.*, 417, 1929.

†868/1. AZOLLA FILICULOIDES Lam. Pulborough, Sussex, Miss COTTES.

NOTES ON POTAMOGETON.

WILLIAM HARRISON PEARSALL.

I. THE BRITISH GRASS-LEAVED SPECIES.

The plants usually included for convenience under this title are those given in *L.C.*, ed. 11, Nos. 1961 to 1969, and are merely an artificial group. All of them belong to the subgenus *Eupotamogeton* of Raunkiær (*De danske Blomsterplanters Naturhistorie* I., 1, 1896, 34, 108), but to different groups of it. The first two species—*P. zosterifolius* and *P. acutifolius*—belong to Hagström's *Compressi* (*Crit. Res.*, 1916, 64), and all the remaining species are included in Graebner's *Pusilli* (*Potamog.* in A. Engler, *Das Pflanzenreich*, 1907, 106). Hagström (*l.c.*, 74) considers *P. trichoides* to be more closely allied to the *Compressi* and therefore places it in the group next to that, the *Monogyni*, as the sole species. Most authorities, however, agree with Graebner's classification.

The *Pusilli* are divided by Hagström into two sections:—

I. *Pusilli connati* having sheathing stipules connate and ochreate—*P. Friesii*, *P. rutilus* and *P. panormitanus*.

II. *Pusilli convoluti* having sheathing stipules open and convolute—*P. obtusifolius*, *P. pusillus*, *P. Sturrockii* and the hybrid *P. franconicus* (*pusillus*×*trichoides*). We should also include here *P. trichoides*.

The *Pusilli connati* must not be confused with the same author's *Connati* (*P. filiformis* and its vars.), which is an entirely different group. The study of the stipules of the linear-leaved *Potamogeton* species has been much neglected in this country and the literature on the subject affords little assistance and is, indeed, in some instances quite misleading. On the other hand much has been written of the fruits, although the distinction afforded by them is usually of little use to the average collector even if he is fortunate enough to find them present.

In the *Pusilli* the stipules are of paramount diagnostic importance and they should always be carefully examined directly the plant is taken from the water and their character noted. They are normally boat-shaped scarious sheaths, very thin, transparent, whitish or brownish-white in colour and usually soon deciduous—decaying and falling after fulfilling their function of protecting the young shoots and leaves. Some are more persistent than others, but in most species it is generally possible to find well-formed stipules for study, if the bases of the young leaves and shoots are examined.

In the majority of the linear-leaved species of *Potamogeton* the stipules are very similar in shape to those of the larger species of the genus but much smaller in size. Normally they are split from top to bottom and although their margins often overlap at the base, they form a narrow V-shaped opening at the apex. The following species possess

these open and convolute stipules:—*P. zosterifolius*, *P. acutifolius*, *P. obtusifolius*, *P. pusillus*, its sub-sp. *lacustris* and varieties, *P. Sturrockii*, *P. trichoides* and ×*P. franconicus*.

On the other hand 3 species—*P. Friesii*, *P. rutilus* and *P. panormitanus*—have stipules which are closed tubes for the greater part of their length, the margins having grown together and coalesced. There is usually a similar V-shaped opening at the apex, but it is comparable to that of a "woollen pullover" and is closed at the base. These tubular stipules are slightly wider above and, of course, ultimately split on one side with the increased growth of the leaves they contain (*P. Friesii* splits both back and front). They are then apt to be mistaken for the open convolute stipules previously described and hence the necessity for their examination while young. In the *Graminæ* a similar distinction between an open and a closed ligule is often of great service in distinguishing genera—cf. the entire ligule of *Bromus*.

P. zosterifolius Schumacher, *Enumer. pl. Sœll* I., 1801, 50. *P. compressus* L. ap. Fries, *Nov. Fl. Suec.*, 1828, 44-46.

Stem broad, 3-6 mm., flattened, nearly winged and branched. Leaves similar, sessile, linear and grass-like, 10-20 cm. long × 2-4 mm. wide, very variable, usually abruptly pointed (rounded and cuspidate), occasionally somewhat acuminate and then resembling those of the next species. Commonly with 3 larger principal veins—5 in much branched robust plants—and very many fine parallel longitudinal intermediate ones. Stipules oblong, lower very obtuse and cuspidate, upper acuminate. Spikes many flowered, cylindric (1.5-3 cm. long), on stout peduncles usually 3-6 cm. in length but sometimes more. Fruit large (3.5-5 mm. long), obliquely obovoid, somewhat bluntly tricarinate, often with slight teeth on the back and a central beak. Often propagated by winter-buds which are larger and thicker than those of *P. acutifolius* and have "the inner leaves always ± (up to 10 mm.) surpassing the others, with free tips." In *P. acutifolius* the inner leaves do not usually protrude.

P. acutifolius Link, in Roemer and Schultes *Syst. Veget.*, III., 1818, 513. *P. cuspidatus* Schrader ap. Smith *Eng. Fl.* I., 1824, 234.

Stem narrower than in the preceding species and more flattened than that of any other species in the genus. Leaves linear, 5-13 cm. × 4 mm., very acute and finely acuminate with 3 principal veins and many fine parallel longitudinal intermediate ones. "At times the midrib is composed of many compacted ribs and translucent." Stipules nearly an inch long, persistent, acute and narrower than in the preceding species. Spikes ovate or globose, few-flowered (4-8), very short on short peduncles usually about 10 mm. but occasionally up to 36 mm. In this species the peduncle and spike are normally subequal. In *P. zosterifolius* the ped. is usually 2 or 3 times as long as the spike. Fruit large, 3-4 mm. long, compressed, semi-obovate, with ventral margin nearly straight, having a tooth near its base and a recurved beak near the apex. A

much rarer species than the preceding. Hagström (*l.c.*, 69) states that the stem epidermis cells of *P. zosterifolius* are constantly short—1.5-3 times as long as broad—while those of *P. acutifolius* are constantly long —4-6 times (or more) longer than broad. The var. *major* Fieber, is a tall and robust plant with longer and wider leaves—often 15 cm. × 5 mm. —occasionally met with in this country.

P. obtusifolius Mertens and Koch, *Deutsch. Fl.*, 1823, 855. *P. gramineus* Smith, *Eng. Fl.*, 1828, 235.

Stem slender, slightly compressed, with rounded edges, longitudinal axis about twice the shorter one. Normally much branched even in deep water forms. Leaves linear, sessile, narrowed below, very slightly tapering at the apex, obtuse or rarely subacute, mucronate. Usually 3-nerved, often with 5, and Fieber (*Pot. Böhm.*, 1838) figures 7. Examples of the last have been seen from Arctic America. Hagström (*l.c.*, 116) says " The midrib and lateral nerves finally grow very faint and join in the very apex." This is misleading, as the lateral nerves commonly join the midrib well below the actual leaf-tip and make a strong curve before doing so. The leaves of this species lack the many fine parallel longitudinal veins of the 2 preceding species. Stipules small (13-20 mm.), unequal in length, open, very obtuse. Spike small, ovoid, continuous, dense-flowered, normally about as long as the rather slender peduncles which are very short as a rule (± 8 mm.) but in Hawes Water, N. Lancs, 36 mm. Fruits usually larger (3-3.5 mm.) than those of *P. pusillus* or *P. Friesii*, but occasionally smaller and then very similar to large fruits of *P. pusillus*, obliquely obovate, slightly compressed, convex ventrally, ± semicircular dorsally, not keeled when fresh but often 3-keeled when dry, with short beak. This species fruits more freely than any other linear-leaved species, producing 8-25 carpels, most of which mature. In the English lakes—as elsewhere—it frequently produces fertile fruits under water and it freely propagates by means of these.

P. Friesii Ruprecht, *Beitr. Pfl. d. Russ. Reiches*, 1845, 43. *P. mucronatus* Schrad. Asch. et Graeb. *Syn. Fl. Mitteleurop.*, 1893, 523. *P. compressus* Smith, *Eng. Fl.*, 1824, 234.

Stem slightly compressed (3 : 1) with rounded edges, slender, little branched. Leaves often fascicled, linear, usually 4-6.5 cm. long × 2-3 mm. wide—Swedish specimens often 7.5-10 cm. × 4 mm.—commonly subacute but may be obtuse and suddenly apiculate; light green in colour often becoming yellowish when dry as is the case with *P. rutilus* and *P. panormitanus*, the 2 other species of the *Pusilli connati* section. The normal leaf possesses 5 veins and the space between the midrib and the nearer of the 2 lateral veins is always much wider than that between the 2 lateral veins—usually it is nearly or quite twice as wide, both the lateral veins being nearer the margin. Thus the relative widths of the spaces from margin to margin are roughly 1 : 1 : 2 : : 2 : 1 : 1. The separate figure of the venation given on Pl. 53 of *Pots. Br. Isles* is

therefore quite incorrect. Occasionally the leaves possess either 3 or 7 veins. Babington (*Man.*, 1922, 442) gives " no intermediate veins," which is correct, but refers to the fine parallel longitudinal veins seen in the leaves of *P. zosterifolius* and *P. acutifolius*. Unfortunately, however, students wrongly assume that there are " no other veins " between the 5 given. There are, of course, the usual short transverse connecting veins. Stipules conspicuous, white or greenish, hyaline connate ochreate but soon splitting both back and front. Spikes short (10-20 mm.), interrupted, with few flowers. Peduncles ± thickened upward but flattened like the stem, 2.5-5 cm. in length—in Scandinavian examples longer. Fruits small (2.2-2.5 mm. × 1.5 mm.), slightly larger than those of *P. panormitanus* which they much resemble in shape, and approximately the same size as those of *P. pusillus* but narrower at the base; olive green in colour, bluntly keeled, with a short beak. This species is still commonly confused with *P. obtusifolius* by both British and foreign botanists, but it may be readily distinguished by its habit, the lighter colour and different venation of its leaves, its much longer peduncles and smaller fruits.

P. pusillus L., *Sp. Pl.*, 1753, 127.

Although this species is very generally distributed and usually more easily obtainable than any other in the genus, it is still imperfectly known. This is largely due to its extreme variability and also to the fact that collectors rarely examine the young stipules while fresh. Stem slender, subterete, usually broadly elliptical in section and very little compressed. In small plants often nearly simple, in large ones (24 in. or more) copiously branched. Leaves very variable in size, measured British examples vary from 20-55 mm. in length and from 0.5 mm. (var. *tenuissimus*) to 2 mm. (sub-sp. *lacustris*) in width. The most general width is 1 mm. or less and the colour dark green. The leaf-apex also shows considerable variation. Typically the apex is more or less rounded and with a subacute tip, but it may be quite obtuse (sub-sp. *lacustris*), mucronate or even tapering and finely acute. Specimens sent by me from Poaka Beck reservoir, N. Lancs, to the late Dr J. O. Hagström were considered by him to possess more acute apices than any he had previously seen (f. *acutissimus* Hagstr.)—see *Rep. B.E.C.*, 1919, 841. The leaves of this species are invariably 3-nerved—even in var. *tenuissimus*. The 2 lateral veins meet the midrib about 1 mm. from the tip, and curve sharply inward before doing so. Transverse connecting veins are usually present in the broader leaves but may be scarce or absent in the narrower ones. The stipules are a most valuable character. They are always open and convolute, small, hyaline, cymbiform, obtuse, 6-8 nerved, and soon deciduous but usually present in the axils of the leaves beneath the branches or peduncles. Spikes very rarely interrupted, usually short and close, 2-12 flowered. Peduncles slender not thickened above, very variable in length, from 0.5-3 cm. most often but in very robust specimens up to 10 cm. They are always at least 2-4 times the length of the spike. Fruits small (2-2.5 mm. long), ± ellip-

tical, scarcely compressed and acuminately pointed above. The back is rounded when fresh but with well-marked blunt keel when dried—sometimes tricarinate. The beak is short normally and only occasionally long. The base often develops tubercles. For a more detailed account of this species see *Journ. Bot.* (*l.c.*).

Sub-sp. *lacustris* Pearsall, *Journ. Bot.*, June 1921, 163-4. See also *Rep. B.E.C.*, 1919, 841.

This deep-water form of *P. pusillus* occurs in all the larger English lakes, and most probably elsewhere under similar habitat conditions—finer and richer soils than *P. pusillus* and under a light-intensity of 10-2 per cent. of full sunlight. Although first distributed as *P. Sturrockii*, we are of opinion that the plants from the English lakes are quite distinct from that species or from any named variety of *P. pusillus*. Both Mr Ar. Bennett and Dr Hagström subsequently confirmed our opinion. The sub-sp. *lacustris* differs from all other forms of *P. pusillus* in its broader leaves of uniformly lighter colour, with apices more obtuse (*f. obtusissimus* Hagstr.) than in any other form of the species—usually nearly semicircular—and in the fact that it propagates itself mainly, if not entirely, by winter-buds. Stem terete, thread-like, branched, with internodes and anatomy as in *P. pusillus*. Leaves of thin texture, soft, light-green in colour—reddish or brown in older leaves—pellucid, 27-55 mm. long × 1.5-2 mm. broad, 3-nerved with lacunæ on either side of the midrib and lateral nerves nearer the margin. Transverse connecting veins are prominent. The leaves are slightly narrowed below, not tapering above, with apex very rounded-obtuse, usually more so than in *P. obtusifolius*. Ligules open and convolute. Peduncles slender, short (± 24 mm.) with small (2-3 mm.) few-flowered spikes. In the original paper (*Journ. Bot.*, *l.c.*) we stated that mature fruit was not produced. In 1921, Esthwaite was abnormally low during the hottest summer and longest drought for 25 years. The sub-sp. *lacustris* fruited freely both in this lake and in Windermere. The fruits are identical with those of *P. pusillus* in size, colour, texture and shape. They vary in size—as do those of the type—but are usually 2 mm. long when well-grown, olive-green in colour with slightly rough (tuberculated) surface and broad false keel. The average length of 13 peduncles from Esthwaite plants in 1921 was 26.5 mm.

Var. *Berchtoldi* (Fieb.) Asch. et Graeb., *Syn. Mitteleurop. Fl.*, 1897, 345.

Fieber's *P. Berchtoldi* (*Pot. Böhm.*, 1838, 40-41) includes forms of *P. pusillus* and also hybrids of that species with *P. Friesii*. French authors give the name to hybrids of *P. obtusifolius* × *trichoides*. The *pusillus* forms have been separated by Ascherson and Graebner as above. They possess broader and rather acute leaves and fruits slightly larger or thicker than in the type. All the " Lake Lancashire " examples mentioned in *Pots. Brit. Isles*, 84, are not this variety but come under var. *major* M. & K.

Var. *tenuissimus* Mert. et Koch, *Deut. Fl.*, 1823, 1.

Stems filiform, much branched. Leaves very narrow—0.5 mm. or less —linear-subulate, acute and 3-veined. Most authors give the leaves of this variety as 1-nerved. The 2 lateral nerves are so faint as to be barely discernible at times, but they are undoubtedly present. (Has any British *Potamogeton* leaves possessing only 1 nerve?) Much of the material so labelled in British herbaria is *P. panormitanus*.

P. Sturrockii Ar. Benn., *Scot. Nat.*, 1883, 28, and *Pots. Brit. Isles*, 1915, 84. *P. pusillus*, sub-sp. *Sturrockii* Hooker, *Stud. Fl.*, 1884, 435. Non *P. Sturrockii* Ar. Benn., *Rep. B.E.C.*, 1919, 841. *P. obtusifolius* × *panormitanus* Hagström, *Crit. Res.*, 1916, 117.

It is unfortunate that there should have been such considerable divergence of opinion as to the true status of this beautiful plant. By various authors it has been described as a species, a sub-species, a variety and a hybrid, respectively. To add to the confusion an entirely different species has been distributed under this name—see *Rep. B.E.C.*, 1919, 841. It may be well for members to remember that all plants from the English Lake District labelled *P. Sturrockii* are *P. pusillus*, sub-sp. *lacustris*. *P. Sturrockii* Ar. Benn. in our judgment has no relation with *P. pusillus* from which it differs in habit, much longer stem internodes, leaves of generally lighter colour, higher L/B ratio and uniformly subacute acuminate tips; longer peduncles and smaller fruits.

We cannot agree with Dr Hagström's contention that it is a hybrid of *P. obtusifolius* × *panormitanus* for many reasons, the chief of which are as follows. Measuring the lengths of the peduncles of a number of normal examples of each species involved, we obtained the following results:—

P. Sturrockii, 38-51 mm.—average 44.5 mm.
P. obtusifolius, 13-38 mm.—average 25.5 mm.
P. panormitanus, 15-30 mm.—average 22.5 mm.

It is impossible to imagine a hybrid whose average peduncles are 44.5 mm. long, having putative parents whose average peduncles are 25.5 mm. and 22.5 mm. long, respectively. If we consider the habitats we find that in Marlee Loch, Perth (whence Sturrock first sent it), *P. obtusifolius* abounds and *P. pusillus* occurs, but no *P. panormitanus*. In Rae Loch the same two species occur but there is no *P. Sturrockii*. On the other hand in Esthwaite Water, N. Lancs, where both putative parents are found—*P. obtusifolius* is abundant and *P. panormitanus* frequent—there is no *P. Sturrockii*!

We therefore conclude that *P. Sturrockii* is entitled to the specific rank Mr Arthur Bennett originally gave it. This opinion is based upon specimens sent to us by the late Mr Arth. Bennett from Marlee Loch, E. Perth, v.-c. 89, leg. A. Sturrock, 8/8/82 (Hbm. A. B., Nos. 607, 608), and many other examples, both dried and fresh, from the same loch, and does not include material from any other sources. This reservation appears to be necessary in view of the fact that in our opinion many

sheets still labelled *P. Sturrockii* are varying forms of *P. pusillus*. Among such examples we should place those from Mugdock Loch, Stirling, R. Kidston, 19/7/1893 (Ex. Hb. A. B., No. 1562). These appear to be *P. pusillus*, var. *Berchtoldi* (Fieb.) Asch. et Graeb.

The authentic *P. Sturrockii* possesses the habit of *P. obtusifolius* rather than that of *P. pusillus*, a filiform stem slightly compressed and branching from the base. Leaves normally similar, long (25-75 mm.), narrow (1-2 mm.), subacute, light green in colour, translucent, with 3-5 nerves, the lateral rather feeble. Internodes very long; Marlee Loch examples 70-140 mm. Peduncles very slender, and usually very long when mature—occasionally 57 mm. in length. Spike from 2-6 mm. long, often dense, few-flowered only in small plants. Fruits smaller than in *pusillus*, both margins regularly rounded, obscurely keeled, with short beak.

P. rutilus Wolfgang in Roem. et Schult. *Sys. Veg. Mant.* iii., 1827, 362.

Stem very slender, ± compressed (2.5-3.1), simple with long internodes above, slightly branched below. Leaves bright green drying yellowish, erect, very narrow linear (0.5 mm. or less), 25-75 mm. in length, numerous below. Normally there are 3 prominent veins dividing the leaf-surface into 4 subequal parts. Occasionally there are 5 veins in the lower half only. The lateral veins join the midrib some distance below the apex—3 or more leaf-widths—but occasionally they peter out in the substance of the leaf without doing so. The leaves are narrower, much stiffer and much more acute than those of *P. pusillus*. They very gradually taper to a sharply acuminate apex and are often reddish at the base. Stipules connate ochreate, 10-20 mm. long, often with a tapering acuminate point, strongly veined and subpersistent. Spikes long (6 mm. or more) and few flowered (6-8). Peduncles 35-50 mm. long, slightly thickened above. Fruit 1-2 mm. long, nearly straight at the back, slightly rounded dorsally, the beak nearly in line with the ventral margin. Winter buds long and narrow but often wanting. Apparently at present only seen from Anglesey, the Orkneys and the Shetlands.

P. panormitanus Bivona Bernardi, Palermo, 1838. (See Hagström *Crit. Res.*, 1916, 98.) *P. gracilis* Fries, *Novit. Fl. Suec.*, 1828, 50.

Stem very slightly compressed, upper internodes long, 6-10 cm. Much branched at the base, little above. Branches long but spike-bearing branches short. Plant not "bush-like" as in *P. pusillus*, and much lighter in colour. Leaves stiffer and narrower than in *pusillus*, with longer and more gradually acute apex. Midrib strong, raised below, lacking the bordering pale stripes (large-celled lacunæ) of that species. The leaves are 3-nerved, the 2 lateral joining the midrib more gradually at a distance of 2-3 times the leaf's width from the apex; light green in colour becoming yellowish when dried. Stipules light-brown, connate ochreate, more persistent than in *pusillus* and the uppermost longer and broader. Spikes cylindrical, ± interrupted, only 2-6 flowered as a rule, on very short branches. Pedun-

cles terete, slender, 15-30 mm. in length. Fruit olive-coloured and smooth, "lacking the basal broadness of *pusillus*" and rarely showing false keels when dry. Winter buds *axillary*—always produced first at the base of the branches and later upwards; slender, relatively narrow, 12-15 mm. long × ½ mm. (or less) thick. In *P. pusillus* the winter buds are *apical*, produced first in the branch tops and later downwards, are much thicker and fusiform in shape. We have seen specimens of this species from the following vice-counties:—12, 13, 14, 16, 17, 22, 24, 27, 29, 30, 32, 40, 44, 46, 47, 49, 52, 53, 73, 85, 88, 89, 96, 98, 109, 111, 112.

P. trichoides Cham. et Schlecht. in *Linnœa*. ii., 1827, 175. *P. tuberculatus* Tenore, ap. Gussone *Fl. Neap.* app. v., 1842, 4. *P. monogynus* Gay ap. Coss. et Germ. *Fl. Paris*, supp., 1843, 89. *P. Phialae* Post, *Bull. Herb. Boiss.* i., 1893, 409.

Habit much like that of *P. pusillus*, which it also resembles in having open and convolute stipules, but its fruiting organs more nearly resemble those of *P. acutifolius*. Stem almost terete, capillary and repeatedly branched, most of the branches bearing spikes. This abundant ramification and richness in spiciferous branches is a marked character of this species. The leaves are very narrow (0.5 mm.—often less and occasionally more), subsetaceous, tapering to a fine point and also tapering to the base, often curled at the apex, semi-amplexicaul, spreading, rigid, deep dull green drying much darker, 25-65 mm. in length and always with 3 nerves. The midrib is relatively thick and wide but the 2 lateral veins are very faint (cf. *P. pusillus*, var. *tenuissimus*) joining some distance (2-3 times the leaf's width) from the apex. Stipules small, slender, open and convolute, acute or subacute and subscarious. Floral stipules larger. Peduncles extremely slender, filiform, not thickened, often curved (especially near the top), 5-11.5 cm. in length, very much longer than the very minute and few-flowered (3-6) spikes, which are oval-oblong or subglobose in form, and usually interrupted. The fruit varies considerably even on the same plant; small, 2-2.5 mm. long, ventral margin nearly straight with a tendency to produce a projection or tooth near its base, dorsal margin nearly semicircular and usually ± tubercled, obscurely keeled with short straight beak. Distribution mainly confined to the Eastern and Southern counties of England and a few places in Scotland.

Collection.—These plants are relatively easy to gather but collectors frequently experience some difficulty before getting them into the press. A vasculum which does not leak is essential, and if this contains a little water to keep the plants from becoming dry, they will withstand many hours' transit without injury. Their journey being ended they should be immersed in an ample supply of water and may be left for the night. This renders their leaves softer and more easy to manipulate when the plants are subsequently floated out. When on holiday, collectors will find the usual wire press very useful but in our own practice we prefer to use 2 drawing boards (18¾ in. × 13⅜ in.) made of several layers of 3-

ply wood and pressed together by 3 bands of thick window-blind cord with a running noose at one end. If 2 in. of the cord are left beyond the knot the pressure can be released in an instant with the greatest ease by pulling on these. Two such boards have been in use by us for 12 years and are still perfectly straight despite damp and pressure. They are somewhat heavier than a wire press but will accommodate any desired thickness of paper and will stand the roughest usage in transport. When collecting from a lake a boat is usually necessary and a word as to the most likely places in which to cast the dredger may not be out of place. No vegetation of any kind will be found below 33 ft., therefore all the rooted plants are found in the relatively narrow and shallow littoral zone. If a knot is tied in the cord 20 ft. above the dredger it will indicate when the depth is too great for *Potamogeton* to be expected. In exceptionally clear water they sometimes occur at this depth but if the water be at all peaty or discoloured half the depth will probably be the limit. Long and unbroken stretches of shore are normally barren, but the bays and smaller inlets should be diligently searched. Prevalent winds cause wave action and set up a decided littoral current which carries the finely eroded material along the shores. Upon entering a bay this current widens, becomes shallower, slows down and deposits its suspended silt upon the lake floor—here one may expect vegetation. Similarly, round the mouths of tributary streams, and on the lee side of a long spit projecting from the shore—either above or below the water-surface—plants may be found. The dredger will often reveal sudden holes or depressions in the lake floor; these are most likely to be silted and therefore to contain plants. As the floors of neither the Scottish nor Welsh lakes have been systematically investigated and mapped, we are of opinion that they should yield a rich harvest to any botanist willing to devote his holidays to their survey.

Elf Hall, Broughton-in-Furness.

MYOSOTIS PALUSTRIS AND ITS VARIETIES.

A. E. WADE, F.L.S.

The following is a preliminary survey and arrangement of the numerous described varieties and forms of MYOSOTIS PALUSTRIS which have come under my notice. The meagre descriptions and absence of type specimens make it, in many cases, difficult to decide what particular forms their authors had in mind, and this has led in the past to names being wrongly applied.

MYOSOTIS PALUSTRIS was first described by Linneaus in his *Species Plantarum*, ed. 1 (1753), as var. b. of his M. SCORPIOIDES, var. a. being ARVENSIS. In 1764 Hill (*Vegetable System*) elevated them to the rank of species, restricting the name SCORPIOIDES to Linneaus' var. b. He, afterwards, in his *Herbarium Britannicum* (1769) changed the name to MYOSOTIS PALUSTRIS. In 1822 Reichenbach in Sturm's *Deutschlands Flora*, heft 42, described two new species, namely, M. LAXIFLORA and M. STRIGULOSA. In the same year Besser (*Enum. pl. Volhyn.*, p. 52) described another species under the name M. NEMOROSA. Reichenbach's two species were reduced to varietal rank under M. PALUSTRIS by Mertens and Koch (*Deutschlands Fl.*, ii., p. 40, 1826). M. NEMOROSA Besser was similarly reduced by Godet (*Fl. du Jura*, p. 478, 1853). Opiz (Berchtold *Ok. techn. Fl. Böhm.*, ii., pt. 2, 1839) described two new species—M. ELATIOR and M. RADICANS. M. ELATIOR was reduced to varietal rank by Schinz and Keller (*Fl. Schweiz*, ed. 3, ii., p. 279, 1914). Du Mortier (*Bouquet du Littoral Belge*, pp. 32-38, 1868) separated from M. PALUSTRIS the forms having short, non-leafy rhizomes and erect stems under the name M. CORONARIA. This he further segregated as follows:—α. GLABRATA, caule glabriusculo strigulis destituto. β. ROSULATA, foliis radicalibus congestis, caule brevissimo. γ. REICHENBACHIANA, caule piloso. δ STRIGULOSA, caule strigulis vestito. The latter is equivalent to Reichenbach's M. STRIGULOSA. The variety GLABRATA is probably identical with M. NEMOROSA Besser which is such a trifling form of M. PALUSTRIS, var. STRIGULOSA that I have here reduced it to the rank of forma of that variety. M. CORONARIA Dum. is so closely related to typical M. PALUSTRIS that I do not feel justified in maintaining it even as a sub-species. Lamotte (*Prodromus fl. plat. central*, p. 538, 1881) described another form of PALUSTRIS with erect stems and non-leafy rhizomes under the name of M. ASPERA. It is given varietal rank in this paper. Rouy in *Flore de France*, x., p. 320, 1908, gives under M. PALUSTRIS, var. a. RADICANS and var. b. LAXIFLORA DC., and segregates the forms with short, leafless rhizomes as a race under the name M. COMMUTATA R. and S., quoting M. NEMOROSA Bess., M. CORONARIA Dum. and M. ASPERA Lamt. as synonyms. The plant of Roemer and Schultes was a form of M. CAESPITOSA Schultz, and the name COMMUTATA is here wrongly applied. Rouy also gives the following varieties under his race:—GLABRESCENS, STRIGULOSA and ROSULATA. The first includes the varieties GLABRATA and

REICHENBACHIANA of M. CORONARIA Dum. The second is equivalent to M. STRIGULOSA Rchb., and the third to M. CORONARIA, var. ROSULATA Dum. Hülphers in 1927 (*Svensk Tidskrift*) described two new segregates under the names M. PRAECOX and M. SEROTINA. M. SEROTINA I have here reduced to varietal rank. M. PRAECOX is probably a good species, but I have not seen a specimen.

From the foregoing it would appear that the earliest name to be given to our water-side forget-me-not as a distinct species is M. SCORPIOIDES, the name adopted by Hill in 1764, and it would thus be the valid one. But it seems that the question of its valid name is not so easily settled. It might be maintained that since Linneaus gave ARVENSIS as the var. a. of his M. SCORPIOIDES, he intended that plant to be taken as the typical form of the species. M. SCORPIOIDES L. would, therefore, be the correct name for M. ARVENSIS Hill as generally understood, and M. SCORPIOIDES Hill would in consequence be invalid as the name for our water-side forget-me-not. In view of the uncertainty as to the correct application of the name M. SCORPIOIDES L., and the very wide use of the name M. PALUSTRIS, I have retained the latter.

MYOSOTIS PALUSTRIS differs from M. CAESPITOSA Schultz chiefly in its larger flowers, in the calyx teeth being shorter and broader, about $\frac{1}{4}$-$\frac{1}{3}$ of the length of the calyx, and in being rather more acute. After flowering the calyx teeth tend to lengthen slightly. The cymes are ebracteate, whereas in CAESPITOSA there are often two or three bracts present at the base. The style is as long as the calyx tube or exceeding the calyx teeth; in CAESPITOSA it is much shorter, rarely becoming as long as the calyx tube. The nutlets are less truncate at the base as compared with those of CAESPITOSA.

The British localities given in this paper are those of specimens in the following Herbaria:—The Herbarium of Dr G. C. Druce (Herb. Druce), the Welsh National Herbarium, National Museum of Wales (Herb. N.M.W.) and the Herbarium of the Manchester Museum (Herb. Manchester).

Acknowledgments are due to the following for the loan of specimens:—Dr G. C. Druce,, F.R.S., Mr G. C. Brown, Dr Carpenter, Dr K. Rechinger of Vienna, Dr E. de Wildeman (Jardin Botanique de l'Etat, Brussels), Dr R. Wettstein (Botanischen Gartens und Institutes der Universität, Vienna), and Dr A. Zahlbruckner (Naturhistorisches Museum, Vienna), and to the following for their assistance in various ways:—The late Mr C. E. Salmon, Mr R. Melville, M.P.S., and Mr A. J. Wilmott, B.A., F.L.S.

MYOSOTIS PALUSTRIS Hill *Herb. Brit.*, p. 170, 1769. M. SCORPIOIDES, var. PALUSTRIS L. *Spec. Pl.*, ed. 1, p. 131, 1753. M. SCORPIOIDES Hill *Veg. Syst.*, vii., 1764. ECHIOIDES PALUSTRIS Moench *Meth.*, p. 416, 1794. M. PERENNIS, var. PALUSTRIS DC. *Fl. France*, iii., p. 629, 1805.

Rhizome long, stoloniferous or short and non-stoloniferous. Stem usually branched, decumbent, rampant or erect, angular, with patent or

adpressed hairs, sometimes almost glabrous. Leaves usually with adpressed hairs, sometimes subglabrous, lower leaves oblong-lanceolate to obovate-lanceolate, obtuse, attenuated into the petiole, the upper leaves narrower, obtuse or subacute and usually apiculate, sessile. Cymes leafless. Calyx campanulate, with adpressed hairs, calyx teeth triangular and about $\frac{1}{4}$-$\frac{1}{3}$ of the calyx. Fruiting pedicels one to two times as long as the calyx, rarely longer, patent or reflexed. Corolla usually 4-10 mm. diam., rarely only 3 mm. diam., sky-blue, rarely white, limb flat, lobes emarginate. Style equalling the calyx tube or longer than the calyx. Nutlets ovoid, black, shining, rounded at the apex, slightly bordered.

Var. MEMOR Kittel *Tasch. Fl. Deutschl.*, ed. 2, p. 421, 1844. M. PALUSTRIS, var. VULGARIS Coss. et Germ. *Fl. de Paris*, ed. 1, p. 266, 1845. M. PALUSTRIS, var. GENUINA Godron *Fl. Lorraine*, ii., p. 40, 1861. M. PALUSTRIS, var. TYPICA Halacsy *Consp. Fl. Graec.*, ii., p. 351, 1902. M. PALUSTRIS, var. RADICANS Rouy *Fl. de France*, x., p. 320, 1908, non Opiz.

Rhizome long, stoloniferous. Stem robust, decumbent, elongated, hairs patent or erect-patent below, adpressed above, but sometimes the plant is almost glabrous. Leaves with adpressed hairs, lower leaves broadly oblong-lanceolate, upper leaves slightly narrower, obtuse or subacute, apiculate. Cymes not long. Lower fruiting pedicels about twice as long as the calyx. Corolla large, 3-8 mm. diam. This is the common form in Britain. It is characterised by its very robust habit and stoloniferous rhizome and by the stem usually emitting numerous barren shoots. The figure in Sowerby's *English Botany*, ed. 3, represents the variety admirably. Kittel's description is very slight. I have not seen a type specimen, but have followed continental botanists, applying Kittel's name to our common form.

Forma ALBIFLORA Desportes (pro var.) *Fl. de la Sarthe*, p. 169, 1838.
Flowers white.

Forma MACRANTHA Beck von Mann. *Fl. Nied.-Oest.*, p. 969, 1893.
A form with flowers from 5-10 mm. diam.

Forma PARVIFLORA Ledeb. (pro var.) *Fl. Alt.*, i., p. 189, 1829.
A form with the flowers about 3 mm. diam. and the flowers rather closer in the cyme.

Localities:—Gilwern, Breconshire; Llangorse Lake, Breconshire, A. E. Wade (Herb. N.M.W.). Earn Shingle, M. Perth, G. C. Druce (Herb. Druce).

G. Klebs (*Einige Ergebnisse der Fortpflanzungsphysiologie* in *Berichte der deutschen botanischen Gessellschaft*, xvii. (Generalversammlungs—Heft (1900), p. 201) found that the size of the corolla of M. PALUSTRIS was changed by feeble light, too moist air or by too strong nutrition.

Var. HIRSUTA Braun in Asch. *Fl. Brandenb.*, p. 448, 1864.

Rhizome stoloniferous. Stems 7-20 cm. high, erect or decumbent, very hairy below with patent hairs, hairs adpressed above. Barren shoots

with patent or erect-patent hairs. Upper leaves ovate-lanceolate, obtuse, apiculate, lower leaves obovate-lanceolate, obtuse. Cymes rather short. Fruiting pedicels as long as the calyx, patent, lower becoming recurved. Calyx as in type. Style longer than the calyx. Corolla 8 mm. diam. The description in Ascherson's *Flora von Brandenberg*, which reads "Niedrig; stengel dicht-rauhha" is too meagre to enable one to be sure of the plant represented by this name. The above description has been drawn up from the Caithness specimens, which I believe to be the form intended by Braun. F. N. Williams in his *Prodromus Fl. Brit.* gives under M. PALUSTRIS the var. CAESPITITIA DC. quoting var. HIRSUTA Braun as a synonym. The former is, however, quite distinct, being a dwarf plant some 3-5 cm. high, with a few adpressed hairs. It was raised to specific rank by Wartmann who named it M. REHSTEINERI.

Localities:—Near Ayton Law, banks of the Eye Water; near Victoria Jubilee Bridge, along the banks of the Eye Water, N.E. Berwickshire; edge of Loch Kinellan, E. Ross, C. Bailey (Herb. Manchester). Sand-dunes, Reay, Caithness, W. A. Shoolbred, G. C. Druce (Herb. Druce, Herb. N.M.W.).

Var. RADICANS Opiz (pro sp.) in *Bercht. Ok. techn. Fl. Böhm.*, ii., 2, p. 113. 1839.

Rootstock stoloniferous. Stem decumbent, rooting, with long patent hairs. Stem-leaves longish-lanceolate, obtuse, apiculate. Fruiting pedicels patent, as long as the calyx. Style longer than the calyx. Corolla smaller than in typical PALUSTRIS. This appears to be little more than a form of PALUSTRIS with small flowers and very hairy stems.

Var. ORBELICA Velen. *Fl. Bulg.*, p. 401, 1891.

Rhizome with long, slender stolons, plant small, 7-15 cm. Stem little branched. Radical leaves obovate-spathulate, attenuated into the petiole, with soft, patent hairs, the rest oblong, acute, sessile, with adpressed hairs. Corolla small. The above is a translation of Velenovsky's description. The writer has not seen a specimen, but the description suggests some affinity to M. REPENS Don. It is found in alpine bogs in Bulgaria.

Var. ALPICOLA Schur *Enum. Plant. Transs.*, p. 474, 1866.

This is described as being subcaespitose ascending and having the stems and leaves setulose-strigose, leaves elliptical-oblong, cymes lax and flowers about half the size of typical PALUSTRIS, and the calyx with white, adpressed hairs. In the Herbarium of Schur in the Natural History Museum of Vienna are two specimens labelled MYOSOTIS PALUSTRIS, var ALPINA, which appear to be the same as the plant described above. In addition to the characters given above the specimens are about 20 cm. high, with a horizontal rhizome. The stems are, however, glabrous below. The cymes are about a third to one-half of the total length of the plant and the fruiting pedicels as long as the calyx, the teeth of which are rather short and broadly triangular, even when in

the fruiting stage. The style is a little shorter than the calyx. On the whole it suggests a somewhat stunted form of the type. Its habitat is given as by rivulets in alpine pastures.

Forma ALBIFLORA Schur (pro var.) *Enum. Plant. Transs.*, p. 474, 1866. Flowers white and a little larger.

Var. SEROTINA Hülphers (pro sp.) *Svensk Bot. Tidskr.*, 21, p. 69, 1927. Stem 30-75 cm. high, more or less patently hairy below, emitting numerous sterile shoots. Leaves numerous, dark green; upper, lanceolate; lower, lingulate and shortly petioled. Fruiting pedicels 1½ times as long as the calyx, patent or a little reflexed. Calyx short, rotundate-campanulate; teeth broad, short, about ¼ length of calyx. Styles a little longer than the calyx. Corolla about 10 mm. diam. Nutlets broadly ovate 1.3-1.6 mm. long, 1-1.2 mm. broad. A specimen in the Welsh National Herbarium, collected and named by Hülphers, has the calyx teeth nearly ⅓ the length of the calyx and the lower fruiting pedicels at least twice as long as the calyx. The Bladon Wood specimens agree with the description in these respects.

Locality:—Bladon Wood, Oxon, G. C. Druce (Herb. Druce and N.M.W.). Hülphers includes England and Scotland in the distribution.

Var. MARTINI Sennen (pro sp.) *Plantes d'Espagne*, 1926, No. 5804.

This plant was issued in the exsiccata with the above title, a description in French appearing on the label. The following is a translation:—Rhizome black, slender, radicant. Stems glabrous, shining, brown, long-leaved, with a very few hooked or adpressed hairs above. Leaves sessile, oblong-lanceolate, hairy, densely ciliate, apiculate, hairs patent. Cymes short, dense-flowered or lax-elongated. Pedicels becoming long, about 1 cm. Calyx teeth short, deltoid. Corolla about 8 mm. diam. Sennen suggests that this is a form intermediate between the species with adpressed hairs and those with hooked hairs. An examination of specimens seen by the writer failed to show the presence of hooked hairs. The specimens were collected in meadows in the Vallée de St Martin, Angoustrine, Cerdagne, at 1500 m. Sennen believes it to be probably endemic.

Var. LAXIFLORA (Reichb.) Mert. u. Koch *Deutschl. Fl.*, ii., p. 40, 1826. M. LAXIFLORA Reichb. in Sturm *Deutschl. Fl.*, Heft 42, 1822.

Rhizome fibrous, creeping a little in water. Stem erect, tall and slender, up to 2 feet high, simple, decumbent when growing in water, hairs adpressed, those of the sterile shoots spreading. Leaves lanceolate, usually narrow, seldom broad, lower leaves obtuse, the upper acute. Cymes lax, single or bifid, 20 or more flowered. Fruiting pedicels 3-4 times as long as the calyx, patent or reflexed. Calyx short, almost hemispherical. Corolla large, 8-10 mm. diam., lobes emarginate. Style slightly longer than the calyx. This is a form of wet shady places, characterised by its tall slender habit, long pedicels, and its style exceeding the calyx. Judging from Reichenbach's rather unsatisfactory speci-

mens in the Natural History Museum of Vienna it approaches var. MEMOR very closely.

Localities:—River Wye, near Chee Tor, Miller's Dale, and near Ashford, Bakewell, Derbyshire, C. Bailey (Herb. Manchester).

Forma GLABRA Schur (pro var.) *Enum. Pl. Transs.*, p. 473, 1866.

Whole plant glabrous.

Forma PARVIFLORA Reichb. in Sturm *Deutschl. Fl.*, Heft 42, 1822.

A form with flowers about half the size of the variety and shorter styles.

Var. STRIGULOSA (Reichb.) Mert. u. Koch *Deutschl. Fl.*, ii., p. 40, 1826. M. STRIGULOSA Reichb. in Sturm *Deutschl. Fl.*, Heft 42, 1822. M. CAESPITOSA, var. STRIGULOSA Boenn. *Prodr. Monast.*, p. 55, 1824. M. CORONARIA, var. STRIGULOSA Dum. *Bouq. litt. belge*, p. 37, 1868. M. SCORPIOIDES, var. STRIGULOSA Schinz u. Keller *Fl. der Schweiz*, ed. 3, ii., p. 279, 1914. M. COMMUTATA, var. STRIGULOSA Rouy *Fl. de France*, x., p. 320, 1908.

Rhizome horizontal, non stoloniferous. Stems erect or decumbent, 30 cm. or more high, with adpressed hairs throughout, seldom with barren shoots. Leaves oblong-lanceolate, strigose, lower leaves lanceolate, obtuse. Cymes fairly long, 20-40 flowered. Fruiting pedicels 1-2 times as long as the calyx, patent or slightly reflexed. Calyx as in typical M. PALUSTRIS. Corolla large, lobes emarginate. Style as long as the calyx tube. This variety has been very much misunderstood by British botanists owing to the very meagre and inadequate descriptions found in British Floras, sometimes "hairs adpressed" being the only character given. Its distinguishing characters are its non stoloniferous rhizome, slender, erect habit, and the stem clothed with adpressed hairs.

Localities:—Coleman Moor, Berks; Harlech, Merioneth, G. C. Druce (Herb. Druce). Criccieth, Carnarvonshire, C. Bailey. Buxton, Derbyshire, W. H. Painter (Herb. Manchester). Near Bakewell, Derbyshire, W. H. Purchas (Herb. N.M.W.). Throxenby Mere, N.E. Yorks, R. Plummer (Herb. Manchester). Inverurie, Aberdeen, F. C. King (Herb. N.M.W.). Gairloch, W. Ross, G. C. Druce (Herb. Druce). Wick, Caithness, W. A. Shoolbred (Herb. N.M.W.). Scarmlett, Caithness; Uyea, Unst; Spiggie, Shetland; Huisbreck Loch-side, Shetland, G. C. Druce. Drayton Fields, T. Beesley. Cashell, Co. Galway, G. C. Druce (Herb. Druce).

Forma VULGATA Beck von Mann. *Fl. von Nied.-Oest.*, p. 969, 1893.

Upper leaves lanceolate, 10-15 mm. broad, shortly apiculate.

Forma LANCIFOLIA Beck von Mann., *l.c.*

Upper leaves linear-lanceolate, sub-acute, apiculate, scarcely 10 mm. broad, usually narrower.

Forma GRACILIS Boenn. (pro var.) *Prodr. Monast.*, p. 54, 1824. Forma MICRANTHA Opiz in Bercht. *Ok. techn. Fl. Böhm.*, ii., 2, p. 114, 1839.

Corolla 4-5 mm. diam.

Forma NEMOROSA Bess. (pro sp.) *Enum. pl. Volhyn.*, p. 52, 1822. M. PALUSTRIS, var. VIRGINIA Kittel *Fl. Deutsch.*, ed. 2, i., p. 421, 1844. M. PALUSTRIS, var. NEMOROSA Godet *Fl. Jura*, p. 478, 1853. M. CORONARIA, var. GLABRATA Dum., *l.c.* M. COMMUTATA, var. GLABRESCENS Rouy, *l.c.*, p.p.

Stem glabrous with a few adpressed hairs above.

Localities:—Cothill, Berks; Wytham, Berks, G. C. Druce (Herb. Druce). Dunham Massey, Cheshire, C. Bailey (Herb. Manchester).

Var. REICHENBACHIANA comb. nov. M. PALUSTRIS, var. GENUINA Gren. et Godr. *Fl. de France*, ii., p. 529, 1852, non Bouvier *Fl. des Alpes*, p. 457, 1878. M. CORONARIA, var. REICHENBACHIANA Dum., *l.c.* M. COMMUTATA, var. GLABRESCENS Rouy, *l.c.*, p.p.

This variety differs from var. STRIGULOSA in having the stem clothed with patent hairs. Gradations between this and var. STRIGULOSA, f. NEMOROSA, are frequent.

Nyman in his *Conspectus* and Gandoger in his *Nuovo Conspectus Florae Europae* give a M. LITHUANICA as a var. or sub-sp. of M. PALUSTRIS. I have been unable to trace a published description of this but I have seen Besser's specimens which are in the Herbarium of the University and the Herbarium of the Natural History Museum of Vienna. Although the specimens are unsatisfactory they evidently belong here. It is not uncommon in Britain and is probably more widely distributed than the var. STRIGULOSA which is, judging from the material I have seen, more Northern in its range.

Localities:—Bransbury, Northants, C. B. Clarke (Herb. N.M.W.). Bullingdon, Oxon; Wytham, Berks, G. C. Druce (Herb. Druce). Marshfield, Monmouth, A. E. Wade (Herb. N.M.W.). Lymm, Cheshire, C. Bailey; Banks of the R. Alt, Hightown, S. Lancs, J. H. Lewis; Formby, S. Lancs, J. & S. Fisher (Herb. Manchester). Ince Blundell, S. Lancs, Rev. W. Wright Mason. Croxdale, Durham, H. E. Fox (Herb. Druce). Jenkin Stells, N.E. Yorks, J. A. Wheldon (Herb. N.M.W.). Garslock, N. Ross, G. C. Druce (Herb. Druce). Cashendum, Co. Antrim, W. A. Shoolbred (Herb. N.M.W.). Castle Taylor, Co. Galway, A. G. More (Herb. Manchester).

Var. ROSULATA comb. nov. M. CORONARIA, var. ROSULATA Dum., *l.c.* M. COMMUTATA, var. ROSULATA Rouy, *l.c.*, p. 321.

Rhizome short non-stoloniferous. Stem erect and short. Lower leaves forming a rosette.

Var. ELATIOR Schinz u. Keller *Fl. der Schweiz*, ed. 3, ii., p. 279, 1914. M. ELATIOR Opiz in Bercht. *Ok. techn. Fl. Böhm.*, ii., 2, p. 115, 1839.

Rhizome short, non-stoloniferous. Stem erect, up to 90 cm. high, glabrous or with a few scattered, adpressed hairs. Cauline leaves large, lingulate, obtuse (the apiculus gives the leaves the appearance of being acute), rather longer in proportion to their breadth than in typical M.

PALUSTRIS, almost glabrous, with a few scattered hairs. Fruiting pedicels patent, about as long as the calyx. Style shorter than the calyx. This well marked variety is, judging by the large gatherings I have seen, the common form in Central Europe.

Var. PSEUDO-CAESPITOSA Fiori in Fiori e Paol. *Fl. An. d'Italia*, Appendix, p. 166, 1907. M. PALUSTRIS, var. STRIGULOSA, forma PSEUDO-CAESPITOSA Beg. in *Ann. di bot.*, del Prof. R. Pirotta, i., p. 277, 1904. M. PALUSTRIS, var. CAESPITOSA. b. MACRANTHA Fiori in Fiori e Paol. *Fl. An. d'Italia*, ii., p. 369, 1902.

Rhizome short, non-stoloniferous or wanting. Plant caespitose. Stems erect. Leaves oblong-lanceolate. Fruiting pedicels 1½-2 times as long as the calyx, patent or reflexed. Calyx rather more deeply cut than in typical PALUSTRIS. Style as long as the calyx tube. Flowers 5-6 mm. diam. This variety is near to the var. STRIGULOSA but is characterised by its caespitose habit and rather more deeply cut calyx, which is, however, not so deeply cut as in M. CAESPITOSA. It differs from CAESPITOSA chiefly in its long style and large flowers. It seems to be confined to Italy and Lower Austria.

Forma APENNINA Fiori in Fiori e Paol. *Fl. An. d'Italia*, Appendix, p. 166, 1907. M. SICULA, var. APENNINA Beg. in *Ann. di bot.* del Prof. R. Pirotta, p. 279, 1904.

A form of var. PSEUDO-CAESPITOSA with flowers only 2-3 mm. diam. and the lobes of the calyx non-emarginate. It occurs growing with the variety in Italy.

Var. ASPERA Lamt. (pro sp.) *Prodr. Fl. Plat. central*, p. 538, 1881, non Schur.

Rhizome oblique, non-stoloniferous. Stem erect, angled, simple or shortly branched above, more or less hairy below with short, stiff, patent hairs, sometimes almost glabrous and shining. Leaves close, the lower covering about ¾ of those immediately above, broadly oblong, rough with adpressed hairs above and with almost adpressed hairs below, apiculate. Radical leaves broad, attenuated into the petiole. Cymes lax. Fruiting pedicels 1-2 times as long as the calyx, becoming patent or reflexed. Style a little shorter than the calyx. This variety forms large tufts in marshy places; when growing in drier places it becomes much stiffer in habit and the hairs more abundant. Central France and Austria.

EXCLUDED VARIETIES.

Var. CAESPITITIA DC. *Prodr.*, x., p. 105, 1846, = M. REHSTEINERI Wartm.

Var. BAETICA Per. Lara. *Fl. Gaditana*, p. 301, 1886-93.

A well marked plant, which I believe to be specifically distinct from M. PALUSTRIS.

Var. SCABRA Simk. *Enum. Fl. Transs.*, p. 408, 1886.

The description is too slight to enable the plant to be identified.

PANSY NOTES.

Dr Eric Drabble.

Notes on the List of Pansies in "The British Plant List," ed. 2, 1928.

It will be evident from Dr Druce's note on p. viii.—"Dr E. Drabble . . . has seen specimens of all the plants [pansies] enumerated, and has supplied the comital numbers"—that the list printed is not exactly as it left my hands.

The claim for *V. Kitaibeliana* R. & S. as a British plant rests on certain specimens collected by Mr W. C. Barton in Jersey (*Rep. B.E.C.*, 1923, p. 30). These were merely large plants of *V. nana*—the f. *major* (sub-var. *major* Rouy and Foucaud), of which Bro. Louis Arsène has sent me excellent material. I have some recollection of naming a plant many years ago for Mr Barton as one of the *Kitaibeliana* Section, but certainly I never called it *Kitaibeliana* R. & S., *sensu stricto*. It has been shown in *Journ. Bot.*, May 1928, pp. 129-132, that we are not in a position to state definitely what Roemer and Schultes meant by *Kitaibeliana*. That there is a *Kitaibeliana* Section seems clear, but no British member of this Section other than *nana* and its forma *major* has come to my notice. Indeed, a consideration of their distribution seems to show that it is improbable that others should occur in this country (*Journ. Bot., loc. cit.*).*

V. nana f. *major* is close to *V. olonensis* Genev. Mem. Soc. Acad. Angers, but I am not able to follow Rouy and Foucaud in making these names synonymous. *V. olonensis* from Gaston Genevier himself in Herb. Kew is distinct from the large specimens of *nana* which are sub-var. *major* R. & F. *V. nana* also occurs on the Sables d'Olonne and with it probably f. *major*, which is merely a growth-form. That Genevier did not confuse these plants is made quite clear by his specimens in Herb. Kew.

As the note on p. 30 in *Rep. B.E.C.*, 1923, calls attention to the fact that Rouy and Foucaud place *derelicta* Jord. under *Kitaibeliana*, it may be useful to point out that they were mistaken. *V. derelicta* Jord. is an *Arvensis* pansy. This is rendered perfectly clear by a consideration of the following specimens:—*V. derelicta* Jord. Haute Savoie, Août 1857 (legit ipse), in Herb. Mus. Brit. and *V. derelicta* Jord. Billot Fl. Gall. et Germ., 2022, in Herb. Mus. Brit. and in Herb. Imp. College of Science.

* My deletion of the brackets from *Viola Kitaibeliana*, which were put in the first edition of the *List*, was due to the statement of Mr W. C. Barton in *Rep. B.E.C.*, 30, 1923, where he says that the type, as well as the var. *nana* DC., occur in Jersey. I there say his larger specimens are what my *nana* grew to in my garden.—G. C. Druce. I cannot imagine what Mr Barton meant by *the type*. We do not know what type *Kitaibeliana* was; certainly it was not a maritime plant of Western Europe.—E. Drabble.

V. lutea Hudson, d. *polychroma* (Kerner). Dr Clausen (*in litt.*) tells me that he thinks *polychroma* Kerner should be placed in the *Saxatilis* series and suggests that in Derbyshire we may have a form of *lutea* parallel to Kerner's *polychroma*. At present I can only say that our *polychroma* is a *lutea* pansy, grading into ordinary *lutea*, and that it seems to me to be identical with *polychroma* Kerner. Formerly (*Journ. Bot. Suppl.*, 1909, p. 10) I had placed it in the *Saxatilis* series.

There remain for consideration the " Names omitted as uncertain or synonymous " (*List*, p. 14) and the additions in *Rep. B.E.C.*, 1928, p. 878.

The omissions from *List*, ed. 1, are as follows:—

V. banatica Kit. This name seems to have got into our Flora when Borbás so named a plant from Stayne Wood, Bembridge, Isle of Wight, collected by C. E. Palmer in 1900. As I have pointed out fully in *Journ. Bot.*, February 1927, p. 47, Borbás was entirely mistaken. F. N. Williams rightly recognised that the plant was unnamed and called it *V. tricolor* var. *vectensis* (F. N. Williams Prod. 10, 1912). It is the *V. variata* c. *vectensis* of the *List*. The name *banatica* is rightly omitted in ed. 2.

V. confinis Jord. The undermentioned sheets are forms of *lepida*.

V. confinis Jord.! Billot, No. 1825, in Herb. Mus. Brit.

V. confinis Jord. Fl. Sequaniae exsicc. 17, in Herb. Mus. Brit. and the corresponding sheet in Herb. Imp. College of Science, S. Kensington.

Indeed the only properly based name of general application to the British forms of the *Saxatilis* series is *lepida*.

V. gracilescens Jord. The specimen in Herb. Kew from Seringe's herbarium, labelled *gracilescens* DC., is not Jordan's plant, while *V. gracilescens* Jord. of Schultz's Herb. Norm. is quite unlike Jordan's figure of *gracilescens*. This name ought never to have appeared in British Lists and is rightly omitted.

V. mentita Jord. ap. Billot Fl. Gall. et Germ., 2021, in Herb. Brit. Mus. seems to be indistinguishable from *ruralis*. Jordan's specimen of *ruralis* in Herb. Imp. College makes this name secure, while *mentita* Jord. is somewhat doubtful.

V. Paillouxi Jord. and *V. Sagoti* Jord.—Jordan himself (*Obs.*, ii., p. 36) expresses some doubt as to the distinctness of these plants. *V. Sagoti* Jord. in Herb. Déséglise, 17 Mai 1862, Haute Savoie, in Herb. Imp. College, is a stout, large-flowered *contempta*, while *V. Paillouxi* Jord., in the same herbarium, resembles a yellow-flowered *Lloydii*. Both names may be ignored as unsatisfactorily based, while both *contempta* and *Lloydii* are beyond dispute.

V. Provostii Boreau (cited as of R. & F. in the *List*) is described by Boreau Fl. du Centre, ed. 3, ii., 82, is an *annual*. His own specimen in Herb. Imp. College is yellow-flowered *lepida*, as is also Gaston Genevier's plant, so labelled, from Vendée in Herb. Mus. Brit. That the plant is *perennial* seems to be shown clearly, at least in the second specimen mentioned, and the question arises whether Boreau wrongly described

Provostii as annual, or whether he confused two plants under this name. The matter was referred to in *Journ. Bot.*, February 1927, p. 44. *Annual* plants of this kind apparently would come under *Lloydii*; *perennial* ones under *lepida*.

V. Timbali Jord. seems not to be satisfactorily distinguishable from *Deseglisei*, but I have not been able to determine exactly what Jordan and Boreau meant by *Timbali*. On the other hand we are left in no doubt about *Deseglisei*, and I have adopted this name in preference to the earlier but unsatisfactory *Timbali*. It is possible, however, that an upright plant with the habit of *Deseglisei* and the texture and hairiness of *agrestis* may be distinct. If so the name *Timbali* may have to be revived for this.

V. meduanensis Boreau seems to be based on plants of *lepida* flowering in their first year. (See *Journ. Bot.*, June 1927, pp. 169-170.)

V. vivariensis Jord. I have not seen any British specimens that agree with Jordan's figure of this plant (*Obs.*, i., plate 2).

V. sabulosa Boreau. F. N. Williams (*Prod.*, iv., 591) rightly pointed out that the plant so named by Jordan from New Brighton and Wallasay Sandhills (now extinct) did not agree with *sabulosa* from Ostend. I have already stated (*Journ. Bot.*, August 1927, p. 218) that a plant from Northumberland with long, narrow leaves approaches true *sabulosa* and I hope to obtain more material this year.

In Dr Druce's "Additions and Corrections to the *List*" in *Rep. B.E.C.*, 1928, vol. viii., part v., p. 878, are given *V. declinata* W. & K. and *V. subincisa* Jord. The name *V. declinata* Waldst. and Kitaib. was quite incorrectly given by A. O. Hume to certain plants collected by P. Hilton at Chailey, Sussex, in 1906 and 1907. I have already pointed out his error in *Journ. Bot.*, June 1927, pp. 170, 171. *V. declinata* has not been found in this country.

V. subincisa Jord. In *Journ. Bot.*, October 1926, pp. 265-6, it was mentioned that two specimens in my herbarium from Nottinghamshire and Lancashire respectively, with the general habit and characters of *segetalis*, possessed very deeply toothed, almost incised leaves. Not having been able to find a specimen of *subincisa* named by Jordan or Boreau I cannot state definitely that these are *subincisa*, though Boreau's description (*Fl. du Centre*, ed. 3, ii., 83) seems to fit them. If so, *subincisa* can only be regarded as a form of *segetalis*.

BRAMBLE NOTES, 1929.

WM. WATSON.

RUBUS CRUENTATUS P. J. M.

In the southern part of Epping Forest, at various spots between High Beech and Fairmead Bottom, I have noticed a bramble which must belong to the *R. obscurus* group, and which I identify as above. I have not seen an authentic specimen of *R. cruentatus* as yet, nor found any description by Müller. The foregoing determination is therefore provisional.

The stem is green, spotted with fuscous red, blunt-angled with flat sides, densely hairy at first and bearing short-stalked glands. The prickles are short and weak, much compressed, patent, declining or falcate; and pricklets with enlarged bases occur. The leaves are 3-5-nate, pedate, light green and thin; rough above, and velvety beneath; the margins with rather uneven blunt teeth; the leaflets becoming convex and plicate. Petiole and petiolules with slender, weak, deflexed or subfalcate prickles; the intermediate petiolules very short. Terminal leaflet broadly elliptical-obovate, tapering into a long and fine point, which is very conspicuous in the young leaves; the base rounded, subentire to subcordate.

The panicle is broadly pyramidal, leafy below, the leaves all green beneath; the lower and middle branches are long and spreading, the pedicels short and the flowers therefore closely congregated together. Rachis flexuous, villous, with many slender yellowish declining prickles, many acicles and many short dark-stalked glands. Calyx segments grey felted and villous externally, glandular and very aculeolate; very white within; patent after flowering, loosely reflexed from the ripe fruit. Petals deep pink, narrowly obovate, tapered below, not clawed, entire at the apex. Stamens pink, equalling or slightly exceeding the magenta styles. Anthers glabrous. Young carpels very pilose. Fruit a deep crimson before turning black.

R. FESTIVUS M. & W.

I have met with this in Epping Forest also, and have had it frequently under my eye in the past two summers. The plant is a good deal hairy, the leaves soft beneath, the stem and panicle rachis purple and bearing unequal prickles, unequal acicles and unequal stalked glands, which last are more numerous on the panicle than on the stem. The stem is densely hairy, blunt-angled with flat sides and bears strongly declining prickles and many subsessile glands. The leaves are 3-5-nate, subdigitate, a fresh green, smooth, glabrescent and subpruinose above; green and silkily pubescent (in the sun subdiscolorous) beneath. The terminal leaflet on 3-nate leaves is broadly ovate-obovate

or roundish, tapered to a short broad point; the base broad, truncate or subcordate. On 5-nate leaves the terminal leaflet is narrower and more oblong.

The flowering branch is densely felted and villous, and has a few long, slender deflexed prickles under the panicle. The panicle in large examples is much branched, broad at the top, the branches short or moderately long, patent and equal; the lower panicles are tapered, lax and leafy; small panicles are simply racemose. The stalked glands and fine prickle-bristles exceed the felt of the panicle branches; the pedicels are very prickly. Flowers rather large, rose pink; calyx segments ending in long leafy tips which stand erect on the bud in the manner of *R. rosaceus*. Stamens red, exceeding the styles. Young carpels glabrous.

R. MACROPHYLLUS, var. BOULAYI Sud.

On Bostal Heath, N.W. Kent, I have collected a striking variety of *R. macrophyllus*, which I identify as above. The stem is greyish green and very glaucous. The leaves are 5-nate, subdigitate, and the leaflets depart altogether from the shape of those in the type. The terminal leaflets are obovate-oblong, with a cuspidate point and rounded base, and are about four times as long as their stalk. Beneath they are slightly discolorous, becoming pale green, and have soft shining hairs and prominent pectinate veins. Stalks of the basal leaflets 3 mm. long. The margins are unevenly and unequally dentate-serrate, the principal teeth patent or repand. The prickles in the panicle are small, numerous and curved. There are a few stalked glands on the stem and in the panicle. Fruit normally produced.

The bramble issued in the *Set of British Rubi* to represent *R. macrophyllus* is this var. *Boulayi* also. It is stated in the *Handbook* to be "not typical."

R. GLABRATUS Bab.

In the preface to the *Handbook* it is stated that Dr Focke has suggested the name *R. ammobius* for a bramble colleced by Mr Druce in North Wales in 1899. By the kindness of Dr Druce I have seen the very specimen that Dr Focke named; and it is, in my opinion, certainly Babington's *R. macrophyllus*, var. *glabratus*.

Babington stated that his knowledge of this form was derived almost entirely from specimens collected by Watson near Long Ditton, Surrey. These can hardly have been *R. glabratus*, which is not met with in Surrey; but were most likely, I think, *R. Bakeri*, which grows at Long Ditton.

I saw *R. glabratus* last summer in several spots around Llanberis—a locality which Babington gives for it—and I give my notes here to supplement the meagre descriptions hitherto available.

Stem purple, furrowed, moderately pubescent, bearing minute stellate hairs and sessile and subsessile glands. Prickles slender, narrow-based, moderate to weak. Leaves yellowish green, 5-nate and incompletely 5-nate, rather plicate, strigose above, rather thickly pubescent beneath at first but not discolorous; finely irregularly denticulate-ser-

rate. Terminal leaflet obovate to suborbicular, subcuspidate, base emarginate or subcordate; twice as long as its stalk. Basal leaflets large and broad, imbricate, their stalks 2 mm. long. Petiole widely grooved below, bearing hooked prickles and many sessile glands; stipules linear-lanceolate.

Flowering branch blunt-angled, glabrous below. Panicle cylindrical, upper branches 2-3 flowered, divided about half-way, pubescent, prickles weak, declining or falciform. Pedicels with many short and nearly straight prickles. Petals fully pink when they unclose, slightly incurved, broadly obovate, notched and clawed. Stamens white (reddening), equalling the greenish styles; at first erect then recurved, not conniving apparently. Anthers cream-coloured, glabrous. Calyx and bracts with stalked glands. Calyx white-felted, segments glandular near their tips, aciculate, loosely reflexed after flowering, then patent; at length completely reflexed.

R. BAKERI F. A. Lees.

Sudre erroneously attributes to this a glabrous stem and round-based leaflets. A good description is given in *E.B. Supp.*; the panicle is, however, broader and more compound than there described. The following notes will enable it to be distinguished from *R. glabratus*.

Stem rather considerably hairy and much branched. Leaves digitate, thickly pubescent and slightly discolorous beneath; unevenly closely dentate with rather deep ovate teeth; petiole bearing strong and rather large curved prickles. Terminal and intermediate leaflets with long falcate and cuspidate points, and cordate or subcordate bases.

Panicle with ascending, cymose, 7-flowered middle branches, broad bracts and bracteoles and subdiscolorous leaves. Rachis felted and villose, with long and strong, declining and falcate prickles, and many sessile glands. Peduncles as a rule unarmed or nearly unarmed. Petals distinctly paler outside, and with a short broad claw. Stamens white, at first not much longer than the green styles but usually lengthening a good deal and conniving over the styles. Calyx segments greenish grey with a white edge, mucronate, broader than in *R. glabratus*. Fruit small, subglobose.

R. MERCICUS Bagnall.

Sudre says that *R. glabratus* appears to him to be simply a variation of *R. mercicus*. The differences are, I think, rather considerable, and quite warrant the two species being maintained. The following description of *R. mercicus* should be compared with that given above of *R. glabratus*.

Stem green to brown and purple, furrowed only towards the apex, with simple or clustered hairs and occasional short scattered acicles and short-stalked glands. Prickles broad-based, numerous, rather unequal, declining or falcate. Leaves rather large, 5-nate, pedate, leaflets contiguous, green and shortly hairy beneath, teeth ovate, somewhat double towards the apex of the leaflets. Petiole with occasional short acicles and short-stalked glands near the base; stipules linear-lanceolate, with

scattered short-stalked glands. Petiole and petiolules with numerous curved prickles. Terminal leaflet broadly oval-obovate, gradually diminished to a short broad point, base entire. Basal leaflets with stalk 3 mm.

Flowering branch angled, slightly furrowed above. Panicle pyramidal, with ascending, cymose, 5-flowered middle branches, and 1-2 simple ovate leaves. Terminal flower long-stalked. Rachis felted and pubescent, with straight, slightly deflexed, moderately strong prickles, very short acicles and short-stalked and subsessile glands. Bracts broad, simple or trifid. Petals obovate, short-clawed, white or nearly white from the first. Stamens much exceeding the styles; anthers glabrous. Calyx segments with attenuate points, pilose and prickly, and with subsessile glands; loosely reflexed. Fruit subglobose, small.

Reduced panicles are racemose, with slender pedicels armed with short acicular prickles.

R. OXYANCHUS Sud.

Two different plants were issued in the *Set of British Rubi* to represent the *R. nemoralis* of the *Handbook* (not of P. J. Müller). That from Branksome Park, Dorset, was named and described by Sudre as *R. oxyanchus*. I have studied this as a living plant in Barnet Wood, Hayes, Kent, and have also seen specimens collected by Mr Britton on Wimbledon Common, Surrey, on the 28th July 1904, as well as specimens from Branksome Park.

The stem is slightly furrowed, conspicuously hairy at first, and is furnished with an occasional stalked gland and pricklet. Leaves pedate, green and glabrescent on both sides, the veins impressed; margin slightly undulate, sharply dentate-serrate, the principal teeth prominent. Petiole short, bearing many small and fine falciform or hooked prickles and broad glandular stipules. Terminal leaflet oval, acuminate, base emarginate, four times as long as its stalk. Intermediate leaflets large, cuneate below, imbricate. Basal leaflets often doubly dentate across their broad apex.

Flowering branch angled throughout. Panicle felted and hairy, with many pale fine declining prickles and subsessile glands. Leaves green beneath, terminal leaflets large, obovate. Panicle often greatly developed and compound; in moderate examples the lowest branches nearly erect, the middle branches deeply divided, sometimes to the base. Pedicels long, ascending. Calyx felted and hairy, green to greyish with a distinct white margin, often aciculate; segments loosely reflexed, very white within. Petals flesh pink, oval-obovate, truncate or retuse, often apiculate, remote, ultimately spreading. Stamens white, connivent, far longer than the greenish or pinkish styles. Anthers and young carpels glabrous.

R. VIRIDICATUS Sud.

The plant from Iford Bridge, S. Hants, also issued in the *Set of British Rubi* to represent *R. nemoralis*, was named and described by

Sudre as *R. viridicatus*. I have not seen this as a living plant, but I have seen specimens from Iford Bridge, and also in Hb. Druce specimens from Barton Common, S. Hants, collected by L. Cumming in 1917, and from Norden Common.

The stem is nearly glabrous and furrowed. Leaves digitate or pedate, glabrous above: at first pubescent, then green and glabrescent beneath; shallowly, subequally denticulate. Leaflets broad and imbricate. Petiole with hooked or falcate prickles and eglandular stipules. Terminal leaflet suborbicular, cuspidate, base emarginate, twice as long as its stalk. Basal leaflets oval, subsessile, small.

Panicle pubescent, eglandular, with rather many falcate prickles. Pedicels short. Upper panicle leaves simple, grey beneath. Calyx segments greyish felted, reflexed in fruit at first, at length clasping. Young carpels glabrous.

This is a smaller plant than *R. oxyanchus*, and has smaller leaves and a more condensed panicle. It has been confused with *R. mercicus* and *R. leucandrus*, as well as with "*R. nemoralis*," *R. plicatus* and *R. dumnoniensis*.

THE STATUS OF ANDROMEDA POLIFOLIA IN NORTH YORKSHIRE.

R. J. Flintoff, F.C.S.

In the *Report of the Botanical Society and Exchange Club* for 1928, vol. viii., part v., p. 630, I drew attention to the discovery, on the 9th June 1924, of one plant of *Andromeda* near Goathland by Miss H. V. Medlicott, and promised that further search would be made. I stated also that Baker in his "Flora of North Yorkshire" gives two stations only for this plant—one on Strensall Common in No. 1 District, the Ouse and Foss area, and the other in or near Balderdale in No. 9 District, the West Tees area. Since 1924 many attempts have been made to find more growths of this plant but without success until 1929. In the light of further experience the reason of these failures is easy to understand, and in this respect it is not necessary to offer any explanation.

On the 22nd May 1929 I received a letter from Captain W. S. Medlicott, of Partridge Hill, Goathland, in which he wrote: "To-day I have had a walk with Jack Rowland (Mr J. Rowland of Goathland) looking for birds. We ate our lunch where *Andromeda* had been found. I told him of my frequent hunts for the Marsh *Andromeda*. Five minutes later he spotted a plant. On looking round we found at least a dozen plants, but rather poor specimens.

A few days afterwards, May 27, Mr W. Raw and I visited this station for *Andromeda*, and after making careful investigation I have no hesitation in stating quite definitely that here it is well established and widely distributed. We counted twenty plants in a limited area, and then did not trouble to count any more, but we saw more plants further away. Therefore the station near Goathland for *Andromeda* has now been well determined, and it is an important one in North Yorkshire. It seemed desirable to obtain reliable data relative to the two stations recorded by Baker, and after no small trouble and many careful enquiries I feel I have learned all the information I can obtain.

THE STRENSALL COMMON STATION.

I am much indebted to my friend, H. J. Wilkinson, of York, the well-known botanist, for the facts which he has given to me. On the 31st of May 1929, Mr Wilkinson wrote:—"*Andromeda polifolia* still grows on Strensall Common, but I am sorry to say it is, in my opinion, on the verge of extinction. In 1881 and 1906, when the members of the British Association visited York, I took some of the Botanists to Strensall. In 1881 five stations were noted, and in 1906 three stations. In 1881 the Government acquired Strensall Common and Towthorpe Common for military purposes. In 1914-18 thousands of troops occupied the Common, cutting trenches, making earthworks, altering the surface

in other ways and the character of the land by drainage. In 1879 I could have counted scores of plants of *Andromeda*. Now I might search all day and not get a plant from the only station I know there. I could say the same of Terrington Carr, only more so. I should not expect to find it there." In another letter, dated 7th of June, Mr Wilkinson made this statement:—"But I must come to the conclusion that *Andromeda polifolia* on Strensall Common is practically extinct." In a conversation I had with Mr Wilkinson a few weeks later at Goathland, he told me he would not go so far as to say an odd plant or even a few specimens could not be found at Strensall, but he would be very surprised to learn it was in any sense established there, and knowing how plentiful it used to be he could only confirm his opinion that it was now practically extinct. On the 23rd September 1929, Mr Wilkinson, after learning that four specimens had been found on Strensall Common wrote me a long letter, from which I take the following remarks:—"To say that *Andromeda* on Strensall is extinct when four specimens have been reported in ten years will be considered by some a misrepresentation. But I still consider it a dying or extinct species on Strensall. Forty years ago I could have counted two or three hundred vigorous plants. Now I should think myself very fortunate to find a single dwarfed specimen."

Dr John S. Gayner, of York, has very kindly supplied me with information. On the 28th September 1929 he writes:—"Personally, I have never found the plant, but I have been shown the plant apparently referred to in the first edition of Baker's 'North Yorkshire,' and generally visit the station every two or three years to note the condition of the plant. I saw it last year, perhaps covering an area of six square feet, and am of the opinion that this represented a large relative increase on the amount of the plant to be seen in that station four years ago. Further, I have been recently informed by an excellent field botanist, perfectly familiar with *Andromeda*, that he has found four small plants of it in another part of Strensall Common." And subsequently, on 2nd October 1929, he gave me a definite expression of opinion. "On Strensall Common I should certainly judge *Andromeda* to be a vanishing species. Baker's plant on the Stockton side of Strensall was going, but revived under the influence of the cold summers from 1922-1927. And I expect these are responsible for the appearance of the new plants. Whether they will endure after the heat and drought of this summer is very doubtful."

In the summer of 1929 Mr H. Britten, of York, found four small plants of *Andromeda* on Strensall Common. Mr Britten has been very kind in writing to me several long and very interesting letters, and I regret very much that limitations of space prevent my including them in their entirety in this note. I shall therefore content myself by quoting the following pertinent extracts:—4th October 1929—"I know nothing of Baker's locality, but I learn from Dr Gayner that the plant still occurs there. I have looked for it frequently on Strensall, but I did not find it until this year when I discovered several plants in one

locality. I did not think any further about this because I did not know of the rarity of the plant until I saw your note in the Report of the Botanical Society. On mentioning the matter to Dr Gayner I found that my locality was a considerable distance from Baker's, and in a totally different part of the Common." And again, on the 25th of October 1929, Mr Britten stated:—"As regards the status of *Andromeda* on Strensall I am not in a position to judge whether it is decreasing, because my knowledge of the district is limited to the last four years. I learn the plant still persists and is slowly increasing in Baker's station. Where I found the plant I noted several specimens in an area of 20-30 square yards, and from my previous experience of *Andromeda* I should say that it is truly at home."

The information I have been able to glean relative to *Andromeda polifolia* on Strensall Common is not quite so definite as I could desire. So far as I have been able to ascertain the facts the truth appears to be that a few small specimens are still to be found there. I have been unable to obtain any data which reflect doubt on the accuracy of Mr Wilkinson's view to the effect that *Andromeda* is nearly, or practically, extinct on Strensall Common. It must be remembered that this opinion is based on a life-time's experience and expresses the great difference between the frequency of the plants many years ago and its rarity at the present time.

THE BALDERDALE STATION.

I have not been able to get such precise information relative to the plant here. But my thanks are due to Mr Thos. J. Foggitt, of Thirsk; Mr John E. Nowers, of Darlington, and Mr J. P. Robson, of Barnard Castle, for the trouble they have taken in helping me.

On the 23rd of June 1929, Mr Foggitt wrote:—"My father, W. Foggitt, found *Andromeda* on the moorhead of Balderdale to the West of Goldesborough, about 1½ miles south of the Junction of the Black Beck and the Balder." And on the 25th of June he wrote a further note to me:—"Since my father's discovery of *Andromeda* in Balderdale in July 1885 I have not seen it there, nor heard of its being found in that locality."

Mr Nowers has been unable to learn anything of this plant after making many enquiries from local botanists. In his last letter to me, dated the 26th of June 1929, he states:—"I am very sorry I cannot get any information re *Andromeda* at Balderdale from any of our members." And in a previous letter he stated:—"I have been making enquiries among some likely members of the Field Club, but none of them knows it there."

Mr J. P. Robson knows nothing concerning this plant at Balderdale. From a consideration of this evidence I feel justified in concluding that the two stations given by Baker are very doubtful now, and probably bad records for the year of grace 1929. Therefore our Goathland station is the only one in North Yorkshire where *Andromeda polifolia* grows as an established plant at the present time. I have taken care and trouble

in trying to collect reliable data, yet it is quite possible my information is far from complete. I shall, therefore, be extremely obliged if anyone, who is acquainted with the plant in the North Riding, will either confirm or correct my statements. I make this request because it would appear this procedure is the only likely method whereby further particulars can be ascertained. From a botanical standpoint the subject is important, and I should like to add that because of the rarity of this plant in North Yorkshire those of us who know where it grows will not give to anyone more detailed particulars than are contained in this note. We desire to protect the plant.

THE BRITISH EROPHILA.

G. Claridge Druce.

Mr J. Gilbert Baker, our one time Secretary, in the *Report of the Thirsk Botanical Exchange Club* (see *Phytologist*, 501, 1858), gave brief diagnoses of *E. brachycarpa*, *E. glabrescens*, *E. hirtella*, *E. stenocarpa* and *E. majuscula*, the last two being named by M. Alex. Jordan himself, who was a most careful and intensive student of the micro-forms of this and of other critical genera. In the *Diagnoses D'Espèces Nouvelles ou Inconnues*, pp. 207-244, 1864, he describes 53 species. These he cultivated for many years, and found that they bred true. In 1866-8, Mm. Jordan and Fourreau produced the magnificent volume of *Icones ad Floram Europae*, with 200 coloured figures, at 300 francs, which contained 5 plates of 20 figures of Erophilas. These are cited in the forthcoming account.

Rouy and Foucaud (*Flore de France*) group all the 56 Jordanian species from France under eight names in the genus *Draba*. 1—Majuscula, under which are *occidentalis*, *brevifolia* and *curtipes*. 2—Lanceolata (Krockeri Andrz. and stenocarpa Jord.), with the Jordanian *tenuis*, *subtilis*, *psilocarpa* as varieties, and *macrocarpa* B. & H. as a form. 3—Leptophylla, with *sparsipila*, *vestita*, *affinis*, *cinerea*, *propinqua* as varieties, and two forms, *dentata* and *furcipila*, including *serrata*. 4—Vulgaris, including *brevipila* and *rigidula* as varieties, and *claviformis*, *cuneifolia* and *Ozanonis* as forms. 5—Spathulata Hoppe (obovata Jord.), with varieties *confinis*, *Andegavensis*, *Lugdunensis*, *fallacina*, *Bardini*, *breviscapa*, *Cabillonensis*, *lucida*, *subintegra*, and three forms, *muricola*, *pyrenaica* and *rurivaga*. 6—Praecox, with varieties, *brachycarpa* and *decipiens*, and forms, *subrotunda* and *Revelieri*. 7—Glabrescens, with varieties *medioxima*, *micrantha*, *glabrescens* = *oblongata*, *rubella*, *procerula*, *campestris*, *ambigens*, *spathulifolia*, *Vivariensis*, *chlorotica*, *lepida*, *patula* and *iodophylla* Briquet, and 2 forms, *virescens* and *subnitens*. 8—Hirtella, with var. *corsica*.

In the *Bulletin de la Société Botanique de France*, xiii., n. 5, 1913, M. Isidore Maranne enumerated 68 species (see *Rep. B.E.C.*, 88, 1914), where a summary and clavis are given, from which we reprint a part. He grouped them under 8 sections, following Rouy and Foucaud:—1, Glabrescens; 2, Hirtella; 3, Praecox; 4, Spathulata; 5, Vulgaris; 6, Leptophylla; 7, Lanceolata; 8, Majuscula.

CLAVIS IN THE FLORE DE FRANCE.

1	H. all or nearly all simple (rarely mixed with bifid); sil. ellipt. or obl.; loc. 14-24 seeded	2.
	H. all or nearly all bifid, some trifid, rarely with a few simple h.	3.
2	Ls. broadish, ov. or obl.-lanc., spreading (flat to the ground); sil. ellip. or obl., slightly atten. or not at base	1 *glabrescens.*
	Ls. lanc., erect or ascending; sil. obl., much atten. at base	2 *hirtella.*
3	Sil. ov.-sub-orb. or obov.-rotund., very obt.; loc. 8-24	4.
	Sil. of a different shape	5.
4	Fl. sm. (3); lobes of pet. nearly or quite contig.; sil. ov.-sub-orb., 3 long×2.5 broad, rounded at top	3 *praecox.*
	Fl. large (3.5-4); lobes of pet. divaricate or divergent; sil. ellip.-obov., 4-7 long×2.5-3 broad	4 *spathulata.*
5	Pl. ± robust, with short bi- or trifid h.; fl. large; sep. ov.-rotund.; sil. elongate, large, ob. or obl.-lanc.; loc. 30-40	8 *majuscula.*
	Pl. ± slend., mostly bifid, a few simp. h.; sep. ov. or obl.; loc. 16-24	6.
6	Ls. lanc. or lin.-lanc.; sil. obl.	6 *leptophylla.*
	Ls. ov.-lanc. or lanc.; sil. narrow, lanc. or lin.-obl.	7 *lanceolata.*
	Ls. broader, ov. or ellip.; h. fairly long; sil. obl. or sub-lanc.	5 *vulgaris.*

Division I.

Hairs all or nearly all simple, rarely a few bifid hairs.

Section I.—GLABRESCENS—St. slend., short, 6-10 cm.; Ls. ± narrow, lanc., obl., or ov.-lanc., with spr. lamina, often recurved at apex; sil. medium size, ellip. or ov.-obl.; loc. 20-24 seeded. 1, *Erophila virescens* Jord. Diagn., 207; 2, *E. nana* Sudre Bull. Ass. Pyren., 5, 1897-8; 3, *E. subnitens* Jord., *l.c.*, 208; 4, *E. spathulifolia* Jord., *l.c.*; 5, *E. vivariensis* Jord., *l.c.*, 210; 6, *E. campestris* Jord., *l.c.*; 7, *E. ambigens* Jord., *l.c.*, 211; 8, *E. medioxima* Jord. in Billot Fl. Gall. et Germ. Exsicc., 1818 (*E. glabrescens* Jord. p.p. Pug. 10, 1852); 9, *E. micrantha* Jord. Diagn. 213; 10, *E. roseola* Sudre Le Monde des Pl., 17, 1912; 11, *E. oblongata* Jord., *l.c.*, 214 (*E. glabrescens* Jord. p.p., var. *erratica* (R. & F.)); 12, *E. rubella* Jord., *l.c.*, 215; 13, *E. procerula* Jord., *l.c.*; 14, *E. chlorotica* Jord., 216; 15, *E. lepida* Jord., *l.c.*, 217; 16, *E. euchloa* Sudre, *l.c.*; 17, *E. patula* Jord., *l.c.*, 217; 18, *E. iodophylla* Briquet (*D. glabra*, var. R. & F. 229); 19, *E. minuscula* Sudre, *l.c.*

Section II.—HIRTELLA—St. slend.; ls. lanc. or ov.-lanc., nearly erect; fl. large (5 mm.); sil. ellip., obt. or obov., ± atten. at base, medium size (6); loc. 20-24. 20, *E. hirtella* Jord. Pug. 10; 21, *E. corsica* Jord. in Magn. Scrin. Fl. Sel. 187 (*D. hirtella*, var. *Debeauxii* R. & F. 231.

Division II.

Hairs all or nearly all bi-trifid, rarely a few simp. hairs.

Section III.—PRAECOX—St. slend.; ls. ov. or broadly lanc.; h. mostly bifid, a few simp.; sil. sub-orb. or broadly ov., usually sm., mostly rounded at base and at top; loc. 16-24; 22, *E. brachycarpa* Jord. Pug., *l.c.*, 9 (*Draba verna*, var. *rotundata* Neilr. Fl. Nied. Oester. 752, 1866); 23, *E. praecox* DC. Syst. Nat. ii., 357, 1821; 24, *E. Girodi* Sudre, *l.c.*,

3, 1906-7; 25, *E. subrotunda* Jord. Diagn. 220; 26, *E. decipiens* Jord., *l.c.*; 27, *E. Revelieri* Jord., *l.c.*

Section IV.—Spathulata—St. slend., few (1-3); ls. broadly lanc. or nearly ov.; h. mostly bifid, a few trifid or simp.; pet. sm., scarcely longer than sep.; sil. broadly obov. or ellip., lanc., atten. at base, rounded or sub-atten. at top, of medium size, but mostly sm. (4-7); loc. 16-24; 28, *E. obovata* Jord., *l.c.*, 221; 29, *E. confinis* Jord., *l.c.*, 222; 30, *E. breviscapa* Jord., *l.c.*; 31, *E. subintegra* Jord., *l.c.*, 223; 32, *E. pyrenaica* Jord., *l.c.*, 224 (*D. muricola*, var *Jordani* R. & F., *l.c.*, 227); 33, *E. muricola* Jord., *l.c.*, 224; 34, *E. rurivaga* Jord. Diagn. 225; 35, *E. Cabillonensis* Jord., *l.c.*, 226; 36, *E. lucida* Jord., *l.c.*; 37, *E. Andegavensis* Jord., *l.c.*, 227; 38, *E. Lugdunensis* Jord., *l.c.*, 228; 39, *E. fallacina* Jord., *l.c.*; 40, *E. Bardini* Jord., *l.c.*, 229.

Section V.—Vulgaris—St. slend.; ls. ov. or ov.-lanc.; h. short, bifid or trifid; sil. ellip.-obl. or obl.-sub-lanc., 5-6; loc. 16-24; 41, *E. claviformis* Jord., *l.c.*, 230; 42, *E. cuneifolia* Jord., *l.c.* (*Draba claviformis*, var. *cuneata* R. & F., *l.c.*); 43, *E. vulgaris* DC. Syst. ii., 356, 1821, sensu stricto; 44, *E. Ozanoni* Jord., *l.c.*, 231.

Section VI.—Leptophylla—St. slend.; ls. lanc. or lin.-lanc., shortly pubescent; h. usually bifid, the others simp.; pet. distinctly larger than sep.; sil. 5-7, obl.; loc. 16-24; 45, *E. dentata* Jord., *l.c.*, 232; 46, *E. furcipila* Jord., *l.c.*, 233; 47, *E. serrata* Jord., *l.c.* (*D. furcipila*, var. *serrata* R. & F.); 48, *E. leptophylla* Jord., *l.c.*, 234; 49, *E. sparsipila* Jord., *l.c.*, 235; 50, *E. vestita* Jord., *l.c.*; 51, *E. affinis* Jord., *l.c.*, 236 (*D. leptophylla*, var *australis* R. & F., *l.c.*, 223); 52, *E. cinerea* Jord., *l.c.*, 237; 53, *E. propinqua* Jord. in Bull. Bot. Soc. Fr. t. xviii., 920; 54, *E. brevipila* Jord. Diagn., 237; 55, *E. rigidula* Jord., *l.c.*, 238 (*D. vulgaris*, var. *rigidula* R. & F.); 56, *E. Charbonnelii* Sudre, *l.c.*, 4, 1907-8.

Section VII.—Lanceolata (*Draba lanceolata* Neilrich, *l.c.*, 742)—St. thin, slend., usually numerous; ls. lanc. or ov.-lanc.; h. short, bifid or trifid; pet. slightly longer than sep.; sil. ± large, lanc., lin. or lin.-obl.; loc. 30-36; 57, *E. stenocarpa* Jord. Pug. 11, 1852 (*E. americana* DC., *l.c.*, 1821); 58, *E. Krockeri* Andrz. En. Pl. Volh., 82; 59, *E. propera* Sudre, *l.c.*, 5; 60, *E. aurigerana* Sudre, *l.c.*; 61, *E. tenuis* Jord. Diagn., 239; 62, *E. subtilis* Jord., *l.c.*, 240; 63, *E. psilocarpa* Jord., *l.c.*, 241; 64, *E. rubrinaeva* Jord., *l.c.*

Section VIII.—Majuscula—St. 6-20 cm., fairly robust; h. short, bitrifid; ls. mostly ov., broad; pet. much longer than sep; sil. large, obl., rounded at the top; loc. 30-40; 65, *E. curtipes* Jord., *l.c.*, 252; 66, *E. occidentalis* Jord., *l.c.*, 243; 67, *E. brevifolia* Jord., *l.c.*; 68, *E. majuscula* Jord. Pug., 11 (*E. verna*, var. *majus* R. & F.).

Schulz' Monograph.

In 1927 (*Das Pflanzenreich*, Heft iv., 105, pp. 343-372, Prof. O. E. Schulz contributed a very valuable monograph on this genus. There is a very complete synonymy but, owing to political conditions, comparatively few British examples were seen. He groups them under 7 species,

of which only 3 are recorded for Britain—VERNA, BOERHAAVII and PRAECOX. He gives the following description:—

A. Folia spathulata. Ovarium ovulis 24-60. Semina 0.3-0.5 mm. longa.
  a. Folia supra pilis minutis tenuibus bifurcatis et stellatis obtecta. Semina 0.3-0.4 mm. longa.
  a. Siliculae elongatae, obverse lanceolatae vel lineares. Ovarium 44-60 ovulatum.
    I. Siliculae oblanceolatae, scilicet basin versus attenuatae, in pedicellis elongatis ..... 1 *E. verna.*
    II. Siliculae lineares, aequilatae, in pedicellis pro rata brevibus ..... 2 *E. macrocarpa.*
  b. Siliculae abbreviatae, breviter obovoideae vel suborbiculatae. Ovarium 24-48 ovulatum ..... 3 *E. Boerhaavii.*
  b. Folia supra pilis majusculis crassiusculisque plerisque simplicibus nonnullis bifurcatis ± intermixtis vestita. Semina 0.5 mm. longa. Ovarium ovulis 24-40.
    I. Siliculae breviter obovoideae ..... 4 *E. praecox.*
    II. Siliculae anguste ellipsoideae vel oblongo-lineares ... 5 *E. setulosa.*
B. Folia anguste linearia. Ovarium ovulis 10-16. Semina 0.75-1 mm. longa.
  a. Siliculae obovoideae, 3-5 mm. longae, 2-2.5 mm. latae ... 6 *E. minima.*
  b. Siliculae anguste ellipsoideae, 4-5 mm. longae, 1.5-2 mm. latae ..... 7 *E. Gilgiana.*

Our regretted member, C. E. Salmon, with E. Gilbert Baker, gave the results of Prof. Schulz's examination of the British Erophilas in a valuable paper which appeared in the *Journal of Botany*, 234, 1928, when Prof. O. E. Schulz named nov. var. *Salmonii* from Essex.

EROPHILA VERNA.

EROPHILA VERNA E. Meyer in Preuss. Pflanz., 179, 1839 = DRABA VERNA L. = EROPHILA VULGARIS DC. Syst., ii., 356, 1821. Schulz Mon. 345, fig. 33, a-n.

Europe, Asia, N. Africa, N. America, Japan.

Scapi singuli vel complures, erecti, sed laterales adscendentes, fructiferi, 10-20 cm. longi, inferne pilis brevibus, c. 0.25 mm. longis, stipitato-bifurcatis et stipitato-substellatis, densiuscule obsiti, pallide violacei, superne glabrescentes, virescentes. *Folia* late lanceolata vel elliptica, apice acutiuscula, margine integra vel apicem versus ± profunde 1-2 dentata = f. *pinnatifida* Wirtgen ap. O. Kuntze Taschenfl. Leipzig, 181, 1867, ad basin in petiolum latum sensim angustata, 1-1.5 cm. longa, supra medium c. 0.5 cm. lata, praesertim supra et margine pilis bifurcatis stellatisque densiuscule obsessa, ad petiolum pilis simplicibus longioribus perpaucis ciliata, interdum basin versus rubro-maculata vel omnino rubescentia. *Racemi* 10-20 flori. Pedicilli floriferi, 6-3 mm. longi, erecto patentes, capillares. *Sepala* 2 mm. longa, dorso pilis simplicibus manifestis, 0.5 mm. longis et stipitato-bifurcis hirta, alba, tandem violaceo-marginata vel plane violacea=f. *rubrocalycina* O. Kuntze Taschenfl. Leipzig, 181, 1867. *Petala* 2.5 mm. longa. *Stamina* 1.5-1.75 mm.; antherae 0.25

mm. longae. *Ovarium* ovulis 50-60. *Siliculae* in pedicillis ex axi valde flexuoso erecto patentibus vel recurvatis elongatis (4.5-) 2.5-1 cm. longis imis saepe non procul a foliorum rosella ortis continuae. oblongo-ellipsoideae, 6.5-9 mm. longae, compressae, supra medium 2-2.5 mm. latae, apice rotundato vix styliferae, basin versus angustatae, viridulae, nonnumquam rubescentes, raro subcontortae. *Semina* numerosa, minima, ovoidea, 0.3-4 mm. longa.

Jersey. St Aubin's, *Piquet*, 1850, in *Hb. Druce*.

17—Surrey. Witley [1220], 1894, *E. S. Marshall* in *Rep. B.E.C.*, 434, 1894, as *vulgaris*; Woking, *Miss M. Saunders* in *Hb. Druce*; Gomshall, 1893, *C. E. Salmon*, see *Journ. Bot.*, 234, 1928.

20—Herts. Fells' Nurseries [62]; between Wilbury Hill and Ickleford [70], *J. E. Little* in *Rep. B.E.C.*, 449, 1913.

22—Berks. Hinksey, 1882, *Druce*.

23—Oxford. Chinnor, 1884; Wigginton, 1915, *Druce*.

24—Bucks. Ivinghoe Beacon, 1923, *Druce*.

29—Cambridge. *H. Baber*, 1837, ex *O. E. Schulz*, with *minutissima*.

32—Northants. Potter's Pury, 1876, *Druce*.

33—Gloster E. Kineton Thorns, *H. J. Riddelsdell* in *Rep. B.E.C.*, 557, 1916.

35—Monmouth. Portskewet [2828], mixed specimens, *E. S. Marshall* in *Journ. Bot.*, 238, 1928.

43—Radnor. Llandrindod Wells, *Miss C. E. Palmer*, 1898, in *Hb. Druce*, ad f. *minutissima* (Griseb.) spectans, O.E.S.

57—Derby. Castleton, *Druce*.

90—Angus. The Lurgies, near Montrose [52], *Corstorphine*.

108—Sutherland W. Near Loch Loyal Lodge, *Druce*.

Dublin. Portmarnock, 1869, *Carroll*.

Forma RUBRO-CALYCINA O. Kuntze.

11—Hants S. Winchester, *Druce*.

24—Bucks. Lane End, 1896, *Druce*, ad var. *cabillonensis* (Jord.) O.E.S. vergens.

A. Section.

FLEXUOSAE Rosen in Cohn, Beitr. Biol. Pfl., x., 392, 1911. Stem slender, gracile, the fruiting portion distinctly serpentine-flexuous.

Var. BARDINII (Jord.) O. E. Schulz = E. BARDINII Jord. Diag., 229, 1864. Jord. and Fourr. Ic., i., t. iv., fig. 13, 1866. Petals 2.5 mm. × 1.5 mm., rose-coloured. Pod 5 mm. × 2-2.5 mm. Leaves subentire or very slightly toothed, 9 mm. × 5.6 mm., oblanceolate, narrowed at base.

19—Essex N. Elmstead [1399], *G. C. Brown* in *Rep. B.E.C.*, 808, 1919, as *affinis*, in *Hb. Druce*; Ross, near Saffron Walden [49141B], *C. B. Clarke* in *Hb. Deless.*; Colchester, *G. C. Brown* in *Hb. Deless.*; Alphamstone, *G. C. Brown* in *Rep. B.E.C.*, 883, 1915.

23—Oxford. Yarnton [41211], 1915, *Druce*.

Var. AFFINIS (Jord.) O. E. Schulz = E. AFFINIS Jord. Diag., 236, 1864. Petals pale rose, 3 mm. long. Pod 6 mm. × 2 mm. France only in *O. E. Schulz.*

19—Essex. Sea wall by Colne [1938], *G. C. Brown* in *Rep. B.E.C.*, 826, 1922, as *majuscula*, in *Hb. Druce.*

20—Herts. Ashbrook St Ippolyts [83 p.p.], *J. E. Little* in *Hb. Druce.*

35—Monmouth. Portskewet [2828], mixed specimens, *E. S. Marshall* in *Hb. Druce.*

[Var. GLABRA (Beck.) O. E. Schulz = E. VULGARIS, f. GLABRA Beck. Fl. Nied.-Oestr., 472, 1892. Stem and sepals glabrous. Lower Austria only.]

[Var. PINGUIS (T. M. Fries) O. E. Schulz = DRABA VERNA, b. PINGUIS T. M. Fries in Thed. Bot. Not., 49, 1852. Leaves fleshy, with rigid short hairs. S. Sweden, Smaland.]

[Var. GLABRESCENS O. E. Schulz. Leaves shortly pilose. Near San Isidro-Leon, Spain, 1864, *E. Bourgeau.*]

Var. CLAVIFORMIS (Jord.) O. E. Schulz = E. CLAVIFORMIS Jord. Diag., 230, 1864 = E. OZANONI Jord., *l.c.*, 231, and Jord. and Fourr. Ic., t. v., fig. 17. Petals 3 mm. long. Upper leaves often deeply dentate. France and Switzerland.

31—Hunts. Warboys Turf Fen, 1880, *A. Fryer* in *Hb. Druce.*

Var. CUNEIFOLIA (Jord.) O. E. Schulz = E. CUNEIFOLIA Jord. Diag., 230, 1864. Jord. and Fourr. Ic., t. v., fig. 18. Schulz, fig. 33. Leaves longly attenuate at base.

7—Wilts N. Burridge Heath, *C. P. Hurst* in *Rep. B.E.C.*, 212, 1920, as *verna*, in *Hb. Druce.*

23—Oxford. Hook Norton to Wigginton [6], *H. J. Riddelsdell* in *Rep. B.E.C.*, 1914, in *Hb. Druce.*

66—Durham. Near High Force [4466] up to 1600 feet, *E. S. Marshall* in *Rep. B.E.C.*, 448, 1928, as *virescens*, in *Hb. Druce.*

Var. SALMONI O. E. Schulz in Journ. Bot., 235, 1928. Folia spathulata; lamina oblongo-elliptica, acutiuscula, integra vel parcissime dentata, in petiolum aequilongum vel longiorem angustata. Differs from *cuneifolia* in its shorter petals.

19—Essex N. Wall between Great Saling and Bardfield, April 14, 1925, *C. E. Salmon* in *Journ. Bot.*, 236, 1928.

Var. SPARSIPILA (Jord.) O. E. Schulz = E. SPARSIPILA Jord. Diag., 235, 1864. Leaves with only scattered hairs. France, *Schulz.*

17—Surrey. Reigate, *C. E. Salmon* in *Journ. Bot.*, 236, 1928.

20—Herts. St Ippolyts [83], *J. E. Little* in *Rep. B.E.C.*, 117, 1914, in *Hb. Druce.*

32—Northants. Dry places, Kirby Hall, 1916, *G. Chester* in *Rep. B.E.C.*, 557, 1916, as *praecox*.
65—Yorks N.W. Near High Force [4465], 1918, *E. S. Marshall*, as *virescens*. See *Journ. Bot.*, 236, 1928.
66—Durham. Near High Force [4465], 1918, *E. S. Marshall*, as *virescens*. See *Journ. Bot.*, 236, 1928.

[Var. STELLIGERA (Rosen) O. E. Schulz = E. STELLIGERA Rosen in Cohn, *l.c.*, 392, 1911. Petals medium size. Leaves few, large. Breslau, Germany.]

[Var. VIOLACEO-PETIOLATA (Lotsy) O. E. Schulz = E. VIOLACEO-PETIOLATA Lotsy in Baunier Rec. Trav. Bot. Néerl., xx., 26, 1923. Petals 4 mm. long. Leaves large, flaccid. Holland.]

Var. INCONSPICUA (Rosen) O. E. Schulz = E. INCONSPICUA Rosen in Cohn, Beitr. Biol. Pfl., x., 392, fig. 5, 7a, 1911. Petals 1.5 mm. long. Leaves minute. Europe.
11—Hants S. Wolmer Forest, ap. 1888, *Canon Vaughan* in *Hb. Druce*.
17—Surrey. Richmond, *C. B. Clarke* in *Hb. Deless*.
19—Essex N. Great Lodge, 1870, *H. E. Fox* in *Hb. Druce*.
23—Oxford. Oxford, 1870, *H. E. Fox* in *Hb. Druce*.
24—Bucks. Great Brickhill, *Druce*.
25—Suffolk E. Horninger, *H. E. Fox* in *Hb. Druce*.
55—Leicester. Glooston, 1910, *A. R. Horwood* in *Hb. Druce*.
58—Cheshire. Moreton, *Mason* in *Hb. Druce*.
63—York. Grassington, 1917, *J. Cryer* in *Hb. Druce*.
66—Durham, Teesdale, 1883, *H. E. Fox* in *Hb. Druce*.

Var. RADIANS (Rosen) O. E. Schulz = E. RADIANS Rosen in Ber. Deutsch. Bot. Gesells., xxviii., 244, 1910. Leaves large, in a strong rosette. Germany, France, Greece.
17—Surrey. Wisley [O.18], 1915, *Druce*.
39—Stafford. Alstonfield, 1872, *W. H. Purchas* in *Hb. Druce*.
64—Yorks W. Arncliffe, 1913, *C. Waterfall* in *Rep. B.E.C.*, 808, 1913, as *majuscula*, in *Hb. Druce*.
66—Durham. Middleton-in-Teesdale, specimens 24 cm. high, *Druce*.

[Var. SERRATA (Jord.) O. E. Schulz = E. SERRATA Jord. Diag., 233, 1864. Leaves oblanceolate, remotely serrate-dentate towards the apex. Petals 2.5-3 mm. long. France, Germany, N. America.]

[Var. RUBRINAEVA (Jord.) O. E. Schulz = E. RUBRINAEVA Jord. Diag., 341, 1864. Jord. and Fourr. Ic., t. iv., fig. 16. Germany.]

[Var. ELONGATA (Rosen) O. E. Schulz = E. ELONGATA Rosen in Bot. Zeit., xlvii., 600, 1889. Plant large. Stem sub-strict. Switzerland, Bosnia.]

[Var. ANGUSTIFOLIA (Lej. & Court.) O. E. Schulz = E. VULGARIS, var. ANGUSTIFOLIA Lej. & Court. Choix de Pl., n. 364, 1823-5 = E. LEPTOPHYLLA Jord. Diag., 234, 1864. Jord. and Fourr. Ic., t. iii., fig. 10. Leaves linear, entire or sub-dentate. Petals 3.5 mm. long. France, N. America.]

[Var. DENTATA (Jord.) O. E. Schulz = E. DENTATA Jord. Diag., 232. Jord. and Fourr. Ic., t. iii., fig. 9. Leaves linear-lanceolate, in the upper part deeply and acutely toothed. Petals 4 mm. long. Germany.]

Var. GRAMINEA (Rosen) O. E. Schulz = E. GRAMINEA Rosen in Bot. Zeit., xlvii., 589, 1899. Leaves linear, entire or scarcely denticulate at the upper part. Petals 4 mm. long. Europe, Greenland, N. America. Not given for Britain by Schulz.

12—Hants N. Wall at Wyatt's Farm, Alton, 1884, *Canon Vaughan* in *Hb. Druce.*

19—Essex N. Twinstead, *Druce.*

23—Oxford. Between Hook Norton and Wigginton [6], *H. J. Riddelsdell* in *Rep. B.E.C.*, 118, 1914, as *stenocarpa*; Signet, 1906, *Druce.*

32—Northants. Kingsthorpe, 1873, *Druce.*

[Var. CHLORINA (Rosen) O. E. Schulz = E. CHLORINA Rosen in Cohn, *l.c.* Germany and France.]

Var. OEDOCARPA (Drabble) O. E. Schulz = E. OEDOCARPA E. Drabble in Journ. Bot., 45, 1926. Stems solitary or few, 2-5 cm. long. Leaves oblanceolate, 2-6 mm. long, entire or shortly toothed. Petals 2.5 mm. long. Pods narrowly obovate-lanceolate, 3-4 mm. × 2-2.5 mm., roundish. Seeds in each loculus 14-16.

5—Somerset N. Cheddar Gorge, 1929, *W. D. Miller.*

14—Sussex E. Bright Downs, *H. E. Fox*, 1860, in *Hb. Druce.*

16—Kent W. Old wall at Eltham, 1867, *H. E. Fox* in *Hb. Druce.*

19—Essex N. The Moors, Alphamstone [91], *G. C. Brown*, as *pyrenaica*, in *Hb. Druce.*

20—Herts. St Ippolyts, as *leptophylla*, ex *J. E. Little*, cult. at Walton, S. Lancs, by *J. A. Wheldon*; Codicote High Heath, April 1912, *J. E. Little* in *Hb. Druce.* Thought to be *decipiens* by Wheldon in *Rep. B.E.C.*, 450, 1913.

22—Berks. Cothill, Marcham, 1929, *Druce.*

28—Norfolk W. Old ant-hills, Ovington [98], *F. Robinson* in *Hb. Druce*, in *Rep. B.E.C.*, 314, 1915. Named *virescens* by Marshall and *brachycarpa* by Wheldon.

57—Derby. Ashover, 1914, *E. Drabble.* Schulz, 351.

58—Cheshire. Wallasey, 1907, *E. Drabble.* Schulz, 351.

66—Durham. On the road opposite High Force Hotel, 1883, *H. E. Fox* in *Hb Druce.*

90—Angus. Montrose [50 p.p.], *Corstorphine* in *Hb. Druce.*
105—Ross W. Inverbroom, *Lady Fowler* in *Hb. Druce.*

Forma MINUTISSIMA (Griseb.) O. E. Schulz.
20—Herts. Mardley Heath [53], *J. E. Little* in *Rep. B.E.C.*, 450, 1913, in *Hb. Druce.*

Var. CONFINIS (Jord.) O. E. Schulz = E. CONFINIS Jord. Diag., 222, 1864 = E. VESTITA Jord., *l.c.*, 235 = E. CINEREA Jord., *l.c.*, 237 = DRABA VERNA Sm. Eng. Bot., t. 586, 1799, non L. Jord. and Fourr. Ic., t. iii., fig. 11. Petals 2.5 mm. long. Pods 5-6 mm. × 2-2.5 mm. Ovary 36-50 seeds. Europe; no British locality cited.
24—Bucks. Saunderton, 1895, *Druce.*
35—Monmouth. Limestone quarry, Portskewet [2828], April 11, 1904, *E. S. Marshall* in *Hb. Druce.* Mixed specimens, " Haec specimina ad *E. verna*, var. *confinis* pertinent " Schulz. Included in the gathering was *E. Boerhaavii*, f. *uniflora.*

Var. CABILLONENSIS (Jord.) O. E. Schulz = E. CABILLONENSIS Jord. Diag., 226, 1864 = E. BREVIPILA Jord., *l.c.*, 237 = E. CONFERTIFOLIA Baunier. Petals 1.75-2 mm. long. Pods 5-6 mm. × 2.75 mm. Europe.
12—Hants N. Odiham, 1883, *Miss C. E. Palmer* in *Hb. Druce.*
13—Sussex W. Downs above Rackham and Amberley [2676], *E. S. Marshall* in *Rep. B.E.C.*, 1902.
14—Sussex E. Brighton Race Course, 1905, *T. Hilton* in *Hb. Druce.*
15—Kent E. Shingle beach, Walmer, 1920, *H. E. Fox* in *Hb. Druce*, " ad f. *minutissima* spectans."
17—Surrey. Wimbledon, 1820, *W. Blake* in *Hb. Druce.* Milford, 1898, *E. S. Marshall* in *Rep. B.E.C.*, 566, 1898, as *stenocarpa.* Lady Davy's garden, Pyrford, 1910, *Druce.* Reigate Heath, 1897, *C. E. Salmon.* Farnham [46701B], *C. B. Clarke* in *Hb. Deless.*
19—Essex N. Bank, Alphamstone, *G. C. Brown* in *Rep. B.E.C.*, 808, 1919, as ? *propinqua.*
20—Herts. Wall of West Mill, Hitchin, *H. C. Littlebury.* See *Journ. Bot.*, 236, 1928.
22—Berks. Cothill, 1915; Frilford, 1929, *Druce.*
23—Oxford. Woodcote, 1882; in arable ground, Charlbury, 1885; Cuxham [O.11]; Binsey, 1894; Bletchingdon, 1905; Broughton Road, Banbury, 1872; Elsfield, 1895, *Druce.*
24—Bucks. Saunderton Station-yard, *H. Clarke* and *Druce.* Brickhill, 1897, *Druce.*
26—Suffolk W. Thetford, 1886, *H. E. Fox* in *Hb. Druce.*
28—Norfolk W. Watton [97], *F. Robinson* in *Rep. B.E.C.*, 314, 1915, in *Hb. Druce.*
32—Northants. Barby, *Druce.*
33—Gloster E. Fairford [2041], *Druce* in *Rep. B.E.C.*, 1904. Westonbirt, *Druce.*

41—Glamorgan. Barry Island, 1905, *H. J. Riddelsdell.* Thought to be *inflata* by *E. S. Marshall* in *Rep. B.E.C.*, 155, 1905.

50—Denbigh. Top of old walls, Bwlch Gwyn, Wrexham, *C. Waterfall* in *Rep. B.E.C.*, 1925, " ad *oedocarpa* vergens."

57—Derby. Brassington Rocks, *W. R. Linton* in *Rep. B.E.C.*, 1900, as *vulgaris*, in *Hb. Druce*. Thought by Marshall to be *stenocarpa*.

65—York N.W. Top of Cronkley Fell [Y.119], *Lousley* in *Rep. B.E.C.*, 563, 1927.

66—Durham. High Force, Teesdale, 1919, *Druce*.

83—Edinburgh. Edinburgh, *T. B. Bell*, 1838, ex *Schulz*.

90—Angus. Field-side near Lunanhead [53], *Corstorphine* in *Rep. B.E.C.*, 118, 1914; edge of salt marsh, Montrose [50], *Corstorphine, l.c.*, 116, 1914. Balnaboth; Inchrory, 1929, *Druce*.

108—Sutherland W. Pebbly path at Loch Loyal Lodge [2418], *E. S. Marshall* in *Rep. B.E.C.*, 621, 1900, as a form of *inflata* in *Hb. Druce*. "Ad formam *minutissima* (Griseb.) O. E. S. vergens."

Forma MINUTISSIMA (Griseb.) O. E. S.

23—Oxford. Cuxham Mill, *Druce*.

89—Perth E. Glen Shee, 1892, *Marshall*.

Var. PYRENAICA (Jord.) O. E. Schulz = E. PYRENAICA Jord. Diag., 224, 1864 = E. LUGDUNENSIS Jord., *l.c.* = E. SABULOSA F. Herm. = D. VERNA, var. SABULOSA Thell. in Hegi Illustr., iv., 390, 1919. Jord. and Fourr. Ic., t. iii., f. 12. Petals 3-3.5 mm. long. Pods 5-6 mm. long. Europe.

19—Essex N. Berechurch, *G. C. Brown* in *Rep. B.E.C.*, 826, 1922, as ? *serrata*, in *Hb. Druce*.

[Var. OBCONICA (De Bary) O. E. Schulz = E. OBCONICA De Bary ap. Rosen in Bot. Zeit., xxvii., 601, 1889. Stalks often very short and with the inflorescence pilose. Pods 5.5-6 mm. long. Europe.]

[Var. CHARBONELLII (H. Sudre) O. E. Schulz = E. CHARBONELLII H. Sudre in Bull. Assoc. Pyr., xviii., 4, 1907-8. Base of the leaves spotted with dull purple. Petals often rosy-violet. Pods 6 mm. × 2.5-3 mm. France.]

Var. HIRTELLA (Jord.) O. E. Schulz = E. HIRTELLA Jord. Pug., 101, 1852. Jord. and Fourr. Ic., t. ii., fig. 6. Stalks in lower parts hispid. Both sides of the acute, oblong-lanceolate leaves hairy, with long, bifid hairs. Petals 2.5-3 mm. long. Pods 6 mm. × 2.5 mm. France, Greece, Spain, Algeria.

66—Durham. Unmortared wall near the High Force Hotel [4467], *E. S. Marshall* in *Rep. B.E.C.*, 488, 1918, as " more hairy *virescens* " in *Hb. Druce*.

Var. RURIVAGA (Jord.) O. E. Schulz = E. RURIVAGA Jord. Diag., 225, 1864. Pods 7-8 mm. × 3 mm. long. France, Caucasus.

66—Durham. Widdy Bank Pastures, March 25, 1915, *J. Cryer* in *Rep. B.E.C.*, 314, 1915, as *majuscula*, in *Hb. Druce*. In abundance. Petals veined, exceeding the sepals. Hairs 2-3-fid. Pods rounded at the top, obovate-oblong. Average 34 seeds in each pod.

Var. MAJUSCULA (Jord.) Haussk. in Verh. Bot. Prov. Brand., xiii., 608, 1871. Druce Br. Pl. List, ed. 1, 5, 1908. E. MAJUSCULA Jord. Pugill., 11, 1852. Jord. and Fourr. Ic., t. 5, fig. 20. Schulz Mon., fig. 34 a. Plant robust. Pod 6-7 mm. × 2.5-3 mm. Petals 2.5-4 mm. long. Upper part of leaves coarsely dentate, greyish green. Europe.

19—Essex N. Alphamstone [882], *G. C. Brown* in *Rep. B.E.C.*, 314, 1915, *Hb. Deless.*

20—Herts. Fells' Nurseries, Hitchin [63], *Little* in *Hb. Druce.*

22—Berks. Inkpen, 1890; Shrivenham, 1895, *Druce.*

23—Oxford. Woodstock, 1905; Charlbury, 1882; Cassington [O.8], 1915, *Druce.*

24—Bucks. Bow Brickhill, 1891, *Druce*, teste *Freyn.*

30—Beds. Near Brickhill, *Druce.*

36—Hereford. Brampton Abbots, *A. Ley* in *Rep. B.E.C.*, 437, 1909.

48—Merioneth. Llanderfel, 1860, *W. Pamplin* in *Hb. Druce.*

54—Lincoln N. Leverton, *Mason* in *Hb. Druce.*

62—York N.E. Gormire, May 1858, *J. G. Baker* in *Journ. Bot.*, 237, 1928.

90—Angus. Near Bridge of Dun (52b), *Corstorphine* in *Rep. B.E.C.*, 117, 1914; The Lurgies, Montrose, p.p., *Corstorphine, l.c.*, 117, 1914.

Var. AMERICANA (Pers.) O. E. Schulz = DRABA VERNA, var. AMERICANA Pers. Syn., ii., 190, 1807 = E. AMERICANA DC. Syst., ii., 356, 1821 = E. PSILOCARPA Jord. Diag., 241, 1864. Petals 2-2.5 mm. long. Pods obversely linear oblong, 7-10 mm. × 1.5-2 mm. Europe, N. America.

17—Surrey. Cultivated field near Lockner Farm, Chilworth, 1918, *C. E. Salmon* in *Journ. Bot.*, 237, 1928.

Var. KROCKERI (Andrz.) Asch. & Graeb. Fl. Nordost. Flack., 364, 1898, excl. of MAJUSCULA = E. STENOCARPA Jord. Pugill., 11, 1852, et Diag., 239, 1864, p.p. Jord. and Fourr. Ic., t. iv., fig. 15. Schulz Mon., 356, fig. 34b. Leaves lanceolate, more or less entire. Flowers small. Sepals 1 mm. Petals 1.5 mm. long. Pods linear oblong. Europe (no British locality given), N. America.

11—Hants S. Near Townhill Park, Southampton, 1918, *W. R. Sherrin* in *Journ. Bot.*, 238, 1928. Winchester, 1891, *Miss C. E. Palmer* in *Hb. Druce.*

13—Sussex W. Sandy field, Greatham, May 1906, *E. S. Marshall* in *Rep. B.E.C.*, 211, 1906, in *Hb. Druce*; Lavington [2583], 1901, *E. S. Marshall* in *Journ. Bot.*, 238, 1928.

17—Surrey. Milford [1218], *E. S. Marshall* in *Rep. B.E.C.*, 438, 1894, as *stenocarpa*; oatfield, Frimley, *Wolley-Dod* and *Marshall* in *Rep. B.E.C.*, 435, 1894; do. [1215], 1894; Wisley [O.18], 1915; Byfleet, 1929, *Druce*.

20—Herts. Stony loam in corn, St Ippolyts [60], *J. E. Little*, as *stenocarpa*. See *Journ. Bot.*, 238, 1928.

22—Berks. Tubney; Coleman's Moor, *Druce*.

23—Oxford. Stanton St John, *Druce*.

24—Bucks. Bow Brickhill, 1899, *Druce*.

30—Beds. Near Brickhill, 1899, *Druce*.

38—Warwick. Packington, 1809, *Countess of Aylesford*. Lighthorn, 1852, *Miss C. E. Palmer* in *Hb. Druce*.

105—Ross W. Gairloch, *Druce*.

Var. ACROCARPA (Brenner) O. E. Schulz = E. STENOCARPA Jord. Pugill., 11, 1852; Diag., 239, 1864, ex parte = E. ACROCARPA Brenner in Meddel Soc. Faun. et Fl. Fenn., xxix., 5, 1912 = E. AURIGERANA Sudre and Maranne in Bull. Soc. Bot. Fr., lx., 384, 1913. Plant small, 4-9 cm. Leaves minute. Pods 5-6 mm. × 1.5-2 mm. Europe. British Isles not given.

Jersey. Quenvais, *C. E. Salmon* in *Journ. Bot.*, 238, 1928. "Ad *oedocarpa* vergens" O. E. S.

15—Kent E. Woolwich, 1724, *Dillenius*. Walmer and Kingsdown, 1918, *H. E. Fox* in *Hb. Druce*.

17—Surrey. Milford Heath, 1898, *J. Comber*; do., 1912, as *stenocarpa*, in *Hb. Druce*. Newark Abbey; Wisley, *Druce*. Byfleet Church; Chilworth, *C. E. Salmon*.

18—Essex S. Burnham-on-Crouch, *W. R. Sherrin*. See *Journ. Bot.*, 238, 1928.

20—Herts. St Ippolyts [60 and 61], *J. E. Little* in *Rep. B.E.C.*, 118, 1914, as *stenocarpa*. N. of West Minns [696], *J. E. Little* in *Hb. Druce*.

22—Berks. Bagley, 1882, *B. King* in *Hb. Druce*. Frilford; Tubney, 1929, *Druce*.

23—Oxford. Elsfield, 1895; Deddington [O.13], 1915, *Druce*.

26—Suffolk W. Bury St Edmunds, *Miss Todd*; Mildenhall, *R. S. Adamson* in *Rep. B.E.C.*, 213, 1920.

27—Norfolk E. Castle Acre, *Hb. Druce*.

30—Beds. Mauldon, 1914, *J. E. Little* in *Rep. B.E.C.*, 118, 1914, as *stenocarpa*; Sandy, *J. E. Little*; Leighton Buzzard, *Druce*.

56—Notts. Welbeck, 1929, *R. Goulding* in *Hb. Druce*.

57—Derby. Millers Dale, 1906, *Druce*.

59—Lancashire S. Near Liverpool, 1835, *Hb. Druce*.

78—Peebles. Peebles, *McT. Cowan*, 1912, in *Hb. Druce*.

Forma MINUTISSIMA (Griseb.) O. E. S.

20—Herts. Ickleford House, Hitchin [68], *J. E. Little* in *Rep. B.E.C.*, 449, 1913.

B. Section.

SCAPOSAE, *l.c.* Stalk thickened below, rigid, upper part slightly flexuous.

[Var. COCHLEATA (Rosen) O. E. Schulz = E. COCHLEATA Rosen in Ber. Deutsch. Bot. Gesell., xxviii., 244, 1910. Blade of the leaf at first ovate. Petals 4 mm. long. Pods subovoid, subtumid. Germany. Also a hybrid with *radians*.]

[Var. STRICTA (Rosen) O. E. Schulz = E. STRICTA Rosen, *l.c.* Leaves at first rhomboid. Petals 3 mm. long. Pods oblong-ovoid, subcompressed. Schulz Mon., fig. 34 c. Europe, North and East.]

[Var. HARCYNICA F. Hermann in Verhl. Bot. der Prov. Brand., xlv., 195, 1904. Leaves broadly lanceolate or obovate, coarsely dentate. Petals large, 4 mm. long. Pods subellipsoid, about 8 mm. × 3.5-4 mm. Germany.]

Var. SESSILIFLORA (Beck.) O. E. Schulz = E. VULGARIS, var. SESSILIFLORA Beck., *l.c.*, 172, 1892 = E. COCHLEOIDES Lotsy. Schulz Mon., fig. 34 d. Leaves numerous, short, broadly obovate, subsessile. Stalk short. Petals 2.5-3 mm. long. Pods claviform, subtumid.

16—Kent W. Old walls, Bexley Heath, 1867, *H. E. Fox* in *Hb. Druce*.
17—Surrey. Milford [1216, 1217], *E. S. Marshall* in *Rep. B.E.C.*, 435, 1894, as "perhaps *virescens*," in *Hb. Druce*.
83—Edinburgh. Midcalder, 1858, *Bell* in *Hb. Druce*.

[Var. PATENS (Rosen) O. E. Schulz = E. PATENS Rosen, *l.c.* Leaves larger than in *sessiliflora*, obovate-lanceolate. Fruiting pedicels horizontally patent. Breslau, Germany.]

EROPHILA MACROCARPA.

[E. MACROCARPA (Boiss. & Heldr.) Boiss. Fl. Orient., 304, 1867 = D. MACROCARPA Boiss. & Heldr. Diag., 28, 1849 = D. VERNA, var. MACROCARPA Halac. Consp. Fl. Graec., i., 102, 1901. Recedes towards *verna* in its narrower pods. Stems solitary or few, always erect, in the lower part with appressed, furcate hairs. The leaves with furcate or stellate hairs. Raceme with 4-12 flowers. Sepals 1.5 mm. long, thinly pilose. Petals 2.5-3 mm. long. Pods with stalks 1.5-0.4 cm. long, narrow linear, (5)7-12 × 1.2(3) mm. Ovary with 14-60 ovules. Schulz Mon., fig. 35 a, b. Mediterranean area, Asia Minor.]

Erophila Boerhaavii.

E. Boerhaavii (Van Hall) Dumortier Fl. Belg., 120, 1827. The specific name is given from *Alysson vulgare polygoni folio loculo rotundo.* E. Boerhaavii Index Alter Pl. Hort. Lugd. Batav., ii., 4, n. 10, 1720 = Draba verna L., β Boerhaavii Van Hall Specim. Bot., 149, 1821. Schulz Mon., fig. 35 c, d.

Planta fructifera, usque 10 cm. alta. *Scapi* inferne pilis brevissimis tenuissimisque simplicibus et furcatis usque ad 0.25 mm. longis vestiti, superne glabrescentes. *Folia* brevia, obovato-spathulata, acutiuscula integra vel utrinque 1-3 dentata, in petiolum angustata, pilis furcatis brevissimis tenuissimisque densiuscule obtecta, margine basin versus pilis simplicibus paucis paulo longioribus ciliata, cum petiolo 4-10 mm. longa, superne 1.5-4.5 mm. lata, membranacea saepe rubescentia. *Racemus* sub anthesi laxiusculus dein laxus, 5-10 florus. Pedicelli 5-1 mm. longi. *Sepala* 1 mm. longa, glabra vel hispida. *Petala* 2 mm. longa. *Ovarium* ovulis 32-18. Siliculae in pedicellis 18-3 mm. longis, obovoidea-subrotundae, 4-5 mm. longae, 2.5-3 mm. latae, apice rotundato, stylo brevissimo apiculatae, basin versus parum angustatae, stramineae vel pallide rubescentes. *Semina* 0.4 mm. longa.

Mature plant up to 10 cm. in height. Stems clothed in the lower part with very fine, short, simple or forked hairs up to 0.25 mm. long, upper part glabrescent. Leaves short, narrowed into the petiole, obovate-spathulate, acutish, entire or each side bearing 1-3 teeth, with very short, rather dense, fine forked hairs, the leaf margin ciliate towards the base with a few somewhat longer simple hairs. The leaf, including petiole, 4-10 mm. long, 1.5-4.5 mm. broad at the top, membranous and often reddish. Raceme lax at flowering, becoming laxer, with 5-10 flowers. Pedicels 5-1 mm. long. Sepals, 1 mm. long, glabrous or hispid. Petals 2 mm. long. Ovaries with 32-18 ovules. Pods pedicellate, 18-3 mm. long, obovoid-subrotund, 4-5 mm. long, 2.5-3 mm. broad, rounded at the top, with short apiculate style, slightly narrowed at base, straw coloured or pale reddish.

Europe, Asia, N. America.

3—Devon S. Otterton, 1866, *H. E. Fox* in *Hb. Druce.*

6—Somerset N. Stow Easton, 1909, *Miss I. M. Roper* and *J. W. White* in *Hb. Druce.*

12—Hants N. Old Basing Castle, *Miss C. E. Palmer*; Alton, 1885, *Canon Vaughan* in *Hb. Druce.*

15—Kent E. Canterbury, *Bishop Mitchinson.* Deal to Sandwich, 1889; Kingsdown and Walmer, with sub-var. *uniflora* (Opiz) O. E. S., *Fox* in *Hb. Druce.*

17—Surrey. Reigate Heath, 1899, *C. E. Salmon* in *Journ. Bot.*, 239, 1928.

20—Herts. Near Hitchin [50], *J. E. Little* in *Rep. B.E.C.*, 450, 1913. N. of West Mill [69], *J. E. Little* in *Hb. Druce.*

22—Berks. Cumnor, 1895 (as *brachycarpa*); Cothill [O.4]; Marcham [O.5], 1913 and 1929, *Druce*; S. Hinksey, 1929, *Druce.*

23—Oxford. Hook Norton to Wigginton [4], on wall and under trees, April 14, 1914, *H. J. Riddelsdell* in *Rep. B.E.C.*, 116, 1914, as *verna*; Iffley, March 15, 1880, *B. King* and *Druce*, named *brachycarpa* by H. C. Watson. Wall on Broughton Road, Banbury, 1872, *Miss Rusher.* Near Stow Wood [C.11]; Stadhampton [O.10]; Cassington [O.7, O.17]; Bloxham [O.15]; Stanton St John [C.10, C.12]; Elsfield [O.22]; Wigginton [O.14]; Holton [O.21, O.7 p.p.], 1913 and 1929; Stonesfield, 1888 and 1929, *Druce.*

24—Bucks. Cheddington, *Druce.*

30—Beds. Lower Stondon [51], *J. E. Little* in *Hb. Druce.*

32—Northants. Barnack, 1906, *Druce.*

33—Gloster E. Cirencester, *W. J. Greenwood* in *Hb. Druce.*

50—Denbigh. Pensarn, *Druce.*

58—Cheshire. Bidston, 1876, *J. W. Burton* in *Hb. Druce.*

60—Lancashire W. Frequent, Lytham, April 1905, *C. Bailey* in *Hb. Druce.* "Ad *brachycarpa* vergens," O. E. S.

62—York N. Scawton, 1858, *J. G. Baker* in *Hb. Druce.*

66—Durham. Sugar Hill, 1805, in *Journ. Bot.*, 239, 1928.

69b—Lancs N. Barrow-in-Furness, April 12, 1913, *D. Lumb* in *Hb. Druce.*

84—Linlithgow. Queensferry, *Balfour* in *Hb. Deless., O. E. S.*

111—Orkney. Kirkwall, 1817-8, *Gillies, O. E. S.*

Sub-var. UNIFLORA (Opiz) O. E. S.

15—Kent E. Kingsdown, 1918, *H. E. Fox.* Walmer, *Druce.*

27—Norfolk W. Ovington [98], *Robinson* in *Hb. Deless., O. E. S.*

35—Monmouth. Portskewet [2828], 1904, *E. S. Marshall* in *Rep. B.E.C.*, 10, 1904, in *Hb. Druce.* Tintern Abbey, *Druce.*

69b—Lancs N. Sandhills, Askham, *D. Lumb* in *Rep. B.E.C.*, 119, 1914, as *praecox* ? in *Hb. Druce.*

Var. VINDOBONENSIS O. E. Schulz. Leaves sparingly pilose, green. Stalk often glabrous. Austria, France, Kashmir.

18—Essex S. Billericay, 1908, *Druce.*

90—Angus. Wall at Clocksbriggs [55], 1914, *Corstorphine* in *Rep. B.E.C.*, 118, 1914, as ? *obovata.*

[Var. LINEARIFOLIA O. E. Schulz. Leaves oblanceolate or sublinear, 1-1.5 cm. long, the top about 1.5-3 mm. broad. France, Asia Minor, Chile.]

Var. CRASSICARPA (Wirtg.) O. E. Schulz = DRABA VERNA, var. CRASSICARPA Wirtg. Herb. Pl. Sel. Fl. Rhen., fasc. viii., n. 322. Leaves numerous, 2 cm. long, narrow, oblanceolate, serrate, subpinnatifid towards the apex, with a few acute teeth. Pod 4.45 mm. × 2.5 mm.

17—Surrey. Milford [1220 and 1224], *E. S. Marshall* in *Rep. B.E.C.*, 434, 1894, as " near *hirtella*." Headley, *Salmon* in *Journ. Bot.*, 239, 1928.

34—Gloster W. Woolaston, 1896, *Shoolbred*; Tidenham Chase, *Shoolbred* in *Rep. B.E.C.*, 510, 1896, as *praecox*; also from Tuttshill, 1897, all in *Hb. Druce*.

Var. INFLATA (H. C. Watson) O. E. Schulz. Differs in its manifestly inflated, oval or elliptic pod, 3-3.5 mm. × 1.5 mm. Leaves linear-lanceolate.

6—Somerset N. Burnham, 1929, *W. D. Miller* in *Hb. Druce*.

14—Sussex. Hastings, 1904, *Druce*.

17—Surrey. Milford [1217], *E. S. Marshall* in *Rep. B.E.C.*, 434, 1894, as *virescens*.

23—Oxford. Sparsey Bridge, March 1882, *Druce* in *Rep. B.E.C.*, 65, 1882, as *D. verna* var., with the note that the fruit section is almost as round as *inflata*. Babington says of it—" very like the plate of *inflata*." Boswell [Syme] says " is *praecox*;" G. Nicholson says "fide Baker, an unnamed form, approximating *inflata*."

32—Northants. Brackley, 1888, *Druce*.

88—Perth M. Ben Lawers, 1837, *Walker Arnott*. Very near summit, Ben Lawers, *Druce*. Craig Cailleach, *D. Paul* in *Trans. Bot. Soc. Edin.*, 49, 1901. Rocks near Lochan na Chat, 2500 feet, 1913, *C. E. Salmon* in *Journ Bot.*, 239, 1928.

Var. DECIPIENS (Jord.) O. E. Schulz = E. DECIPIENS Jord. Diag., 220, 1864, including E. BREVISCAPA Jord., *l.c.*, 222, E. SUBINTEGRA Jord., *l.c.*, 223, E. LUCIDA Jord., *l.c.*, 226, et Jord. and Fourr. Ic. Fl. Eur., 1, 1866, t. ii., fig. 8 = E. EURTIPES Jord., *l.c.*, 242, = E. OCCIDENTALIS Jord., *l.c.*, 243. Jord. and Fourr., *l.c.*, t. v., fig. 19. Petals 2-2.5 mm. long, lower fruiting pedicels 2.5 mm. long. Pods ellipsoid-pear shaped, obtuse, 4.5-5.5 mm. × 2.25 mm. Europe, W. Asia, Turkestan, Phrygia, Africa, Morocco.

Jersey. Quenvais, 1921, *Druce*.

Guernsey. L'Ancresse, 1919, *Druce*.

3—Devon S. Otterton, 1866, *H. E. Fox* in *Hb. Druce*.

8—Wilts S. Walls of Bishop's Palace Yard, 1883, *Miss C. E. Palmer* in *Hb. Druce*.

10—Isle of Wight. Freshwater, 1889, *Miss C. E. Palmer* in *Hb. Druce*, as *brachycarpa*.

13—Sussex W. Selham [2677], 1902, *E. S. Marshall* in *Journ. Bot.*, 240, 1928.

15—Kent E. Woolwich, 1724, *Dillenius*; Kingsdown, 1918, *H. E. Fox*; Walmer, Deal, 1896; Dungeness, *Druce*. Hythe Rifle Range [Y.136], *Lousley* in *Rep. B.E.C.*, 563, 1927, as *stenocarpa*.

17—Surrey. Milford [2284], *E. S. Marshall* in *Rep. B.E.C.*, 597, 1899. E. F. Linton asks "why not *verna*?" Witley [1225], 1894, *E. S. Marshall*; Reigate, *C. E. Salmon* in *Journ. Bot.*, 240, 1928.

19—Essex N. Alphamstone [884], *G. C. Brown* in *Rep. B.E.C.*, 315, 1915.

20—Herts. Fells' Nurseries, Hitchin, 1912, *Little*; Grove Mill, Hitchin, *Little* in *Rep. B.E.C.*, 808, 1919; between Beiston and Wymondley, 1912, *Little*; Cardwell, 1913, *Little*; Hitchin, 1898, *Druce*.

21—Middlesex. Acton, *A. Loydell* in *Hb. Druce*.

22—Berks. Sheepstead, 1914; Ridgeway, 1895; cornfield, Moulsford, 1915, *Druce*; Cothill, *Druce*, "ad *uniflora* vergens." Frilford, 1929, *Druce*.

23—Oxford. Marston [C.13] (and as *uniflora*); Stadhampton Park Wall [O.20]; Stanton St John, 1915; Finstock, and f. *luxurians*, 1909, as *Ozanoni*; Tusmore, f. *macrocarpa*, *Druce*. Wigginton garden path, *Riddelsdell* in *Rep. B.E.C.*, 487, 1918, as *majuscula*. North Leigh, on site of Roman Villa [P.77], 1929, *Druce*. Banbury, *Beesley*.

24—Bucks. Ivinghoe, 1923, *Druce*.

25—Suffolk E. Aldeburgh, 1911, *Druce*.

31—Hants. About Ramsay and Wood Walton [3663], *E. S. Marshall* in *Journ. Bot.*, 240, 1928.

32—Northants. Colley Weston, 1877, *Druce*. Kingsthorpe, 1892, *Dixon*.

33—Gloster E. Fairford, *Druce* in *Rep. B.E.C.*, 116, 1914.

34—Gloster W. Turfy wall top, Tidenham Chase, as *praecox*; Tuttshill, 1897, *Shoolbred* in *Hb. Druce*.

35—Monmouth. Tintern Abbey, *H. E. Fox* in *Hb. Druce*.

41—Glamorgan. Kenfig, 1926, *Druce*.

Sub-var. LINEARIFOLIA O. E. S. Leaves very narrow, 2-3 mm., more narrowed at base.

17—Surrey. Reigate Heath, 1897, *C. E. Salmon* in *Journ. Bot.*, 240, 1928.

21—Middlesex. On old wall, Neasden, April 5, 1867, *H. E. Fox* in *Hb. Druce*.

23—Oxford. Hethe [41212], 1916, *Druce*; Hook Norton to Wigginton [n.5], *H. J. Riddelsdell* in *Rep. B.E.C.*, 117, 1914, as *verna*.

90—Angus. Field track near Rescobie [54], 1914, *Corstorphine* in *Rep. B.E.C.*, 117, 1914, in *Hb. Druce*.

92—Aberdeen S. Braemar, 1854, *Hb. Druce*.

Var. BRACHYCARPA (Jord.) O. E. Schulz = E. BRACHYCARPA Jord. Pugill., 9, 1852, et Diag., 219, 1864. Petals very small, 1.5 mm. long. Pods 3 mm. × 2 mm. (No British or extra European localities given by Schulz.)

Jersey. Quenvais; St Aubin's, 1907; St Ouen's, 1910, *Druce*.

5—Somerset S. Minehead Warren, c. 1850, *J. G. Gifford*, also [2919] *E. S. Marshall*.

6—Somerset N. Bleadon [2918], 1905, *E. S. Marshall* in *Journ. Bot.*, 240, 1928.

8—Wilts S. Salisbury Palace Walls, 1883, *Miss C. E. Palmer* as f. *uniflora* in *Hb. Druce.*

13—Sussex W. Duncton Down, 1901; wall-top, Chichester, 1902; Downs, Houghton, 1902, *E. S. Marshall* in *Journ. Bot.*, 240, 1928.

15—Kent E. Kingsdown to Deal, 1919, *H. E. Fox* in *Hb. Druce.*

17—Surrey. Milford [1224], 1894, *E. S. Marshall* as *virescens* in *Journ. Bot.*, 240, 1928. Reigate Heath, 1899, *C. E. Salmon.*

22—Berks. Frilford; Marcham, *Druce.*

23—Oxford. Forma *uniflora*, Wigginton, *Riddelsdell* in *Rep. B.E.C.*, 118, 1914, as *praecox.* Sparsey Bridge, 1882; Iffley, 1880; Stadhampton [O.10], 1915; Yarnton [O.6]; Stanton St John [C.10], *Druce* in *Rep. B.E.C.*, 315, 1915; Elsfield, 1915; Marston [O.21]; Charlbury, 1881, *Druce.*

24—Bucks. Wolverton, 1876, *Druce.*

32—Northants. Barnack, 1906, *Druce.*

35—Monmouth. Tintern, March 1916, *Hb. Druce.*

33—Gloster E. Fairford, *Druce.*

53—Lincoln S. Stamford, *Druce.*

57—Derby. Miller's Dale, 1906, *Druce.*

60—Lancs S.W. Frequent on the Green, Lytham, 1905, *C. Bailey* in *Hb. Druce.*

62—York N. Scowton, May 1856, *J. G. Baker*, p.p.

88—Perth M. Ben Lawers, *Druce.*

109—Caithness. Dunnet Links, 1900, *E. S. Marshall* in *Hb. Druce.*

Sub-var. LINEARIFOLIA O. E. Schulz.

19—Essex N. On wall at Twinstead, March 1918, *Druce.*

Var. MURICOLA (Jord.) O. E. Schulz = E. MURICOLA Jord. Diag. 224, 1864 = E. BREVIFOLIA Jord., *l.c.*, 243 = E. OVALIS Brenner. Petals 2.5-3 mm. long. Pods 6-7 mm. × 3-3.2 mm. No British locality given by Schulz. Asia Minor, Himalayas up to 2650 metres, N. America.

Guernsey. Petit Bot, 1910, *Druce.*

22—Berks. Marcham, 1915 [O.1, O.2], "Petals twice as long as sepals, divergent. Hairs bifid or trifid," *Druce.*

23—Oxford. Marston [C.13], May 1915, *Druce* in *Rep. B.E.C.*, 315, 1915.

39—Stafford. Alstonfield, *W. H. Purchas* in *Hb. Druce.*

65—York N.W. Below Ingleborough, May 1926, *Miss I. M. Roper* in *Rep. B.E.C.*, 251, 1926, as *stenocarpa.*

Var. DRUCEI O. E. Schulz, nov. var. Scapi fructiferi, 3-5 cm. alt. Folia anguste spathulata, cum petiolo 5-15 mm. longa, integra. Sepala 1.5 mm. longa. Petala pro rata magna, 3-4 mm. longa.

22—Berks. Walls near Sheepstead House [O.3], 1915. Noted as petals 6 mm., twice as long as sepals; pod large, *Druce.*

23—Oxford. Banbury; Holton Stone Pits [O.5, 6, 7, 8, 9]; Marston [O.21], *Druce*.

Var. MACROPHYLLA O. E. Schulz, nov. var. Folia insigniter magna lataque, cum petiolo 1-1.25 cm. longa, obovata, utrinque 1-2 denticulata, supra medium 4-10 mm. lata, subito in petiolum contracta.

5—Somerset N. Cheddar, 1927, *Druce*.

23—Oxford. Rare. Holton Stone Pits; Binsey, 1914, *Druce*.

Var. OXONIENSIS O. E. Schulz, nov. var. Folia elongata, cum petiolo 1.5-2.8 cm. longa, anguste spathulata, utrinque 1 denticulata, supra medium 4-6 mm. lata, sensim in petiolum angustata.

23—Oxford. Rare. Binsey, 1894, as *spathulifolia*; Marston, 1880 and 1894, *Druce*. A very distinct looking plant on account of its numerous narrowly spathulate leaves in a dense rosette, with arcuate fruiting pedicels.

EROPHILA PRAECOX.

E. PRAECOX (Stevens) DC. Syst., ii., 257, 1821 = DRABA PRAECOX Stevens in Mem. Soc. Mosc., iii., 269, 1812. Includes E. GLABRESCENS Jord. Pug., 10, 1852; E. VIVARIENSIS Jord. Diag., 210, 1864; E. MEDIOXIMA Jord. Pug., 10, 1852; E. MICRANTHA Jord., *l.c.*, 213; E. OBLONGATA Jord., *l.c.*, 214; E. RUBELLA Jord., *l.c.*, et Jord. and Fourr., *l.c.*, i., t. i., f. 4, 1866. Schulz Mon., fig. 35, e., f.

Europe, Asia (Kotschy's Cyprian plant from the Troodos). Schulz gives no British localities.

Planta sub anthesi 1.5-5 cm. alta. *Scapi* saepe solitarii, rarius complures, inferne pilis patentibus simplicibus c. 0.4 mm. longis, interdum brevioribus stipitato-bifurcatis intermixtis disperse vestiti, superne ± glabrescentes. *Folia* brevia, obovato-spathulata, acutiuscula, integra vel utrinque 1-3 dentata, in petiolum angustata, praecipue supra et margine pilis crassis simplicibus longiusculis, 0.5 mm. longis, interdum pilis plerumque paucis bifurcatis intermixtis ± dense obsita, saepe rubro-violacea, cum petiolo 4-10 mm. longa. *Racemus* initio laxiusculus dein laxus, 5-10 florus. Pedicelli 5-1 mm. longi. *Sepala* 1-1.5 mm. longa, glabra vel dorso hirsuta. *Petala* 2-2.5 mm. longa. *Stamina* 1-1.3 mm., antherae 0.2 mm. longae. *Ovarium* ovulis 24-40. *Siliculae* in pedicellis 12-2 mm. longi, breviter obovoideae, compressae, 4-6 mm. longae, 2-3 mm. latae, apice rotundato stylo brevissimo apiculatae, basin versus parum angustatae, straminea vel pallide rubescentes. *Semina* 0.5 : 0.3 : 0.2 mm., humida manifeste tuberculata.

Ireland. Co. Clare, Ballyvaghan.

27—Norfolk E. Old ruined walls, Castle Acre, 1908, *Druce*.

49—Carnarvon. Wall top and edge of footpath, Marine Drive, the Great Orme, *C. Waterfall* in *Rep. B.E.C.*, 118, 1914, as *majuscula*.

[Forma MINUTISSIMA (Willd.) O. E. S. Europe, Asia.]

[Var. CHLOROTICA (Jord.) O. E. Schulz = E. CHLOROTICA Jord. Diag., 216, 1864. The lower part of petal palish yellow. France, Rhine.]

[Var. ROSEOLA (Sudre) O. E. Schulz = E. ROSEOLA Sudre in Le Monde des Pl., xiv., 17, 1912. Maranne in Bull. Soc. Bot. de Fr., lx., 381, 1913. Petals rose coloured. France.]

[Var. SPATHULIFOLIA (Jord.) Druce Br. Pl. List., ed. 1, 5, 1908 = E. SPATHULIFOLIA Jord., 208, 1864. Jord. and Fourr. Ic., t. ii., fig. 5. Plant large, up to 15 cm. Leaves 1-2.5 cm. long, at the upper part 9 mm. broad; 12-15 flowered. Petals 3.5 mm. long. France and Greece.]

Var. MORICANDII O. E. Schulz. Leaves narrow, linear or narrowly oblanceolate, about 1.5 cm. long, by 1.8-3.5 mm. broad. Swiss localities alone cited by Schulz. Named after M. E. Moricand from specimen in Delessert's Herbarium.

32—Northants. On the ironstone walls, Duston, May 1909, *F. S. Willcox*, as *inflata* Hook. f. Named by E. S. Marshall, but see *Wats. B.E.C.*, 220, 1909 (1910).

69b—Lancs N. Seashore at Bardsea, April 1918, *W. H. Pearsall* in *Rep. B.E.C.*, 488, 1918, as *furcipila*.

Var. VIRESCENS (Jord.) O. E. Schulz = E. VIRESCENS Jord. Diag., 207, 1864. Leaves glabrous or with a few simple hairs. Petals 2-2.5 mm. long. Pods often ellipsoid, 3.5 mm. × 2.5 mm. Europe, W. Asia.

Jersey. St Aubin's; Quenvais, 1907, *Druce*.

Guernsey. L'Ancresse, 1907, *Druce*.

3—Devon S. Wall, Knackers Knowle, 1866, *T. A. Briggs* in *Hb. Druce*.

7—Wilts N. On stony platform, Minety Station [2701]; Winsley [2700], 1903, *E. S. Marshall*, " near *majuscula*," in *Hb. Druce*.

14—Sussex E. Beachy Head, 1867, *H. E. Fox*. Down above Lewes, 1898, *T. Hilton* in *Hb. Druce*.

20—Herts. St Ippolyts [55a], 1915, etc., *J. E. Little*. See *Journ. Bot.*, 241, 1928.

22—Berks. Marcham, *Druce*.

23—Oxford. Stanton St John [C.6], 1915; Islip [41214], *Druce* in *Rep. B.E.C.*, 557, 1916; Burford, 1906; Cassington [O.7], *Druce*.

57—Derby. Froggatt, 1903, *W. R. Linton* in *Rep. B.E.C.*, 10, 1903, as *brachycarpa*, in *Hb. Druce*.

90—Angus. Sands of Barry [58], *Corstorphine* in *Rep. B.E.C.*, 119, 1914, as *praecox*.

Forma NANA (Sudre) O. E. Schulz. Stalk slender, 1.5-4 cm. Leaves 2.5 mm. long. Raceme 1-6 flowers. Pods 2-3 mm. long.
Jersey. La Haule, 1907, *Druce*.
14—Sussex E. Downs near Telcombe, 1898, *T. Hilton* in *Hb. Druce*; Beachy Head, 1867, *H. E. Fox* in *Hb. Druce*.
20—Herts. Walsworth, etc., *J. E. Little*. See *Journ. Bot.*, 241, 1928.
23—Oxford. Islip, *Druce*.
37—Northants. Gretton, 1907, *G. Chester*.

Var. SUBNITENS (Jord.) O. E. Schulz = E. SUBNITENS Jord. Diag., 208, 1864. Jord. and Fourr., *l.c.*, t. i., fig. 2. Leaves sparsely hairy. Petals 4-5 mm. long. France only, in Schulz.
14—Sussex E. Walls, Southover, March 1927, *Miss M. E. Edgar* in *Journ. Bot.*, 241, 1928.

Var. MICROCARPA O. E. Schulz. Pods small, shortly obovoid, 3-3.5 mm. × 1.5-2.5 mm.
22—Berks. Park Farm Down (ant-hills), alt. 600 feet, 1929, *C. G. Trapnell* in *Hb. Druce*.

[Var. CAMPESTRIS (Jord.) O. E. Schulz = E. CAMPESTRIS Jord. Diag., 210, 1864 = E. AMBIGENS Jord., *l.c.*, 211 = E. PROCERULA Jord., *l.c.*, 215 = E. PROPINQUA Jord., ex Perard Bull. Bot. Soc. Fr., 320, 1871. Petals 3-3.5 mm. long. Pods 6-9 mm. × 2.25-3.5 mm. France.]

[Var. LEPIDA (Jord.) O. E. Schulz = E. LEPIDA Jord. Diag., 217, 1864 = E. PATULA Jord., *l.c.* Plants often very small. Pods 4-5 mm. × 1.75-2 mm. France.]

[Var. EUCHLOA (Sudre) O. E. Schulz. Maranne, *l.c.*, 381, 1913. Plant 4-5 cm. high. Pods 3.5 mm. × 1.75-2 mm. Albi and Tarn, France.]

EROPHILA SETULOSA.

[E. SETULOSA Boiss. & Blanche Diag., 2, ser. v., 31, 1856; Boiss. Fl. Orient., i., 304, 1867. Plant 3-15 cm. high. Stems many, thick, glabrous. Leaves broadly or narrowly spathulate, acute . . . with petiole 1-2 cm. long, large stiff hairs (setulis), simple, rarely bifurcate. Racemes 3-12 flowered. Sepals 1.5 mm., glabrous or hairy. Petals 2.5-3 mm. Pods long stalked, 7-10 mm. × 2-7.5 mm. Schulz Mon., fig. 35, g, h. Syria.]

[Var. DINGLERI O. E. Schulz, with more hairy leaves. Rumelia.]

EROPHILA MINIMA.

[E. MINIMA C. A. Meyer Verz. Pl. Kauk., 184, n. 1624, 1831. Boiss. Fl. Orient., i., 303, 1867. Plant after flowering 0.5-5 cm., in fruit 1-10 cm. Stems few or many. Leaves elongate, entire, narrow linear, fleshy, drying yellow. Flowers small. Sepals 1 mm. Medit., W. Asia.]

[Var. TURKESTANICA O. E. Schulz. Leaves shorter, 4-5 mm. × 0.5-1 mm. Pods 15 mm. × 2 mm. Turkestan, Syria.]

EROPHILA GILGIANA.

[E. GILGIANA (Muschler) O. E. Schulz = DRABA GILGIANA Muschler. Differs from *minima* by its more numerous, ascending, filiform stems, shorter leaves, sepals 0.75 mm. glabrous. Pods 15 mm. × 5 mm. Syria.]

EROPHILA MUSCOSA.

[E. MUSCOSA DC. Syst., ii., 358, 1821 = DRABA MUSCOSA Ruiz & Pavon ex Steudel Nom., ii., 528, 1840. Among moss, Peru, *Ruiz* and *Pavon* in *Hb. Lambert.* Plant small, resembling moss in its appearance. Stem 1-2 flowered. Pods elliptic.]

HYBRIDS.

[E. BOERHAAVII × PRAECOX = E. VINCENTII O. E. Schulz. France.]

[E. PRAECOX × VERNA (E. GLABRESCENS—MAJUSCULA Favrat) = E. CHAVINII (L.) Favrat. Switzerland, France, Germany.]

E. BOERHAAVII × VERNA = E. FAUCONETTII O. E. Schulz. Pods abortive, small. Seeds none. Switzerland, France, Hungary.

22—Berks. Frilford, 1920, *Druce.*

49—Carnarvon. Pen-y-Dinas, *Druce.*

THE STABILITY OF FORMS IN OUR FLORAS.

E. ALMQUIST.

Studies of spontaneous plants in their native habitats together with cultures of them amply demonstrate the status praesens in the vegetable kingdom. Past and future researches must of necessity take account of the present status. If speculations on evolution are contrary to our experience, they must be rejected. Our experience shows a remarkable stability of the forms of both the higher and lower plants. Constancy nowadays rules almost everywhere. New-bred forms now and then appear but usually disappear quickly. Very seldom are they fit for spreading. On the contrary, some imported plants spread immediately after crossing. But the same forms seem to prevail in our floras now as in the days of Linné, almost 200 years ago, and in culture they reveal the same characters as in the Linnean garden. All indicate a stability that, of course, has an enormous importance for man and science. It is absurd to speculate on evolution without knowing the status praesens.

It is certain that constancy prevails, but nevertheless we are able to observe some slight changes in the forms. I intend to illustrate these changes by my studies of Bacteria and of *Capsella Bursa-pastoris*. I have cultivated 200 forms of *Capsella*, mostly from Europe, but some also from Siberia and America. In repeated cultures almost all forms revealed constancy. They followed the rule of Alexis Jordan that small species, although growing together, do not cross spontaneously. In France and other Southern countries one meets hybrids of *C. rubella* and its kindred. In my cultures the named forms often crossed, also Swedish forms and fertile or sterile hybrids appeared. I have been able to follow for a long time 12 groups of fertile hybrids. Most of them originated from my own cultures, but some I received from France or other Western countries. In the neighbourhood of Stockholm, at Rosendal, some remarkable Capsellas have persisted for at least 20 years. Some of them are hybrids, and two seem to be constant. I named these *C. latisiliqua* and *C. cuspidata*. All without doubt had their origin in Southern countries.

In France we find different constant forms which seem to originate from *C. rubella* by crosses. *C. turoniensis* has concave or oblique capsules, *C. mediterranea* convex capsules, with deep notch. My new-bred hybrids show quite similar forms, and therefore I suppose that many existing constant forms were once bred as crosses with *C. rubella* and its kindred. I like to enlarge the theory and suppose that most of the present innumerable Capsellas are bred in that way. As the ice melted many plants akin to *C. rubella* followed to Northern countries. A great many bred hybrids, most of them evanescent, but some were fit for the environment and survived. Especially in parts of Germany and round

the Baltic Sea we find an infinite number of forms that have almost reached constancy. Many are not able to spread and live only in small territories. The breeding by mutation continues in our day, commonly caused by " nutrimentum luxurians." On composts of algae on the shores, on dirty streets, etc., they lose the petals and the developed forms of the leaf, the stems become weak, all signifying the "lose" mutation. In Alsace, on a market place, a few specimens of *C. Heegeri* grew for some years. The capsules were round, the stem high, very firm and foliose. Cultures produced, among hundreds similar, one individual with triangular capsules. The late forms are not always identical. Some are conformable to *C. lata*, which also belongs to the neighbourhood of the Rhine. Some show characters reminding one of *C. rubella*, especially in the small seeds and in the lobes of the leaves. We do not know if crossing or mutation bred the new form, but *C. lata* and *C. rubella*, to be sure, are the near kindred.

R. Koch proved the constancy of many Bacteria. Nowadays we are able to make cultures from only one individual and follow the strain in different environments. Bacteria are as constant as the higher plants. They produce spores, and in the pathogenic bacteria often after leaving the host. The "lose" mutation is well known. Some observers, *i.e.*, Dodeswell, talk of a copulation. I have seen haplont kernels develop to diplonts. Thus sexuality is not to be excluded. My observations on Capsellas and Bacteria are to be found in " Zur Artbildung in der freien Natur " (Acta Horti Berg., ix., Nr. 2, 1926).

Many authors neglect facts and experience in a striking manner. They exclude inconvenient facts which differ from their systems and pia desideria, and make up hypothetical interpretations. Some authors do not know plants in their natural state and form conclusions from their experience of cultivated plants, where man's will rules. Man preserves and upholds innumerable forms unfit for occurrence. On the contrary in nature constancy rules and every form finds its suitable habitat. The theory that neglects facts must on that account be condemned.

NOTES ON MENTHA.

J. FRASER.

×*Mentha niliaca* Jacq., var. *Druceana* Fraser. Var. nov. (*M. longifolia* × *rotundifolia*). Stem stout, erect, freely branched, with slender, sharply ascending branches, moderately densely villous, with deflexed or retrorse hairs, but loosely so in some places, 2-3 feet high; internodes 3.5-6 cm. long. Leaves narrowly ovate or ovate-lanceolate, gradually narrowed from near the base to a long, acuminate, very acute point, sessile, cordate or subcordate at the base, sharply serrate, thinly hairy with very short hairs above and dark green, undersurface 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, in some specimens rather deep (0.25-3 mm.), acute; leaves of the branches lanceolate, otherwise like those on the stem. Spikes cylindrical, very dense, 3.5-6 cm. long, the lateral ones close under the main spike, 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, 4-5 joints being the most common. Corolla pale lilac-purple. Stamens included, rarely exserted.

The above description was first drawn up from a specimen gathered near Abingdon, Berks, in 1926, by G. C. Druce, and distributed under the name of ×*M. niliaca* Jacq. The specimen reached me after I had finished the descriptions of Menthae Britannicae for the Supplement of the B.E.C. Report for 1926, and though I had Jacquin's description it was inadequate to distinguish the above from the type, and time failed me just then to consult his plate. The description is slightly altered to include a specimen from Yarnton, Oxon, collected in 1927 by G. C. Druce, with a longer main spike; and another from Tenby, Pembroke, collected by Miss E. S. Todd in 1929, with deeper serratures to the leaves. The long, gradually acuminate leaves readily distinguish the variety from all others of this group of hybrids.

×*M. niliaca* Jacq., var. *mollissima* Borckh., f. *brevipila*. Forma nov. The leaves are dark green above (not grey), and covered with a very short mealy pubescence, consisting of the bulbous basal joint of the hairs, intermixed with a few, very short, slender hairs; the undersurface is more grey and, while the lower leaves are very thinly hairy, showing some amount of mealy pubescence, the upper and younger ones are tomentose beneath. In all other respects this is the same as the variety *mollissima*.

This variety bears the same relation to var. *mollissima* as the var. *Nicholsoniana* does to var. *nemorosa*, and var. *pulverulenta* (Strail) does

to *M. longifolia*. The two last named were originally described as species. I have been unable, so far, to get the locality or name of the collector of the new form. It was sent me by Dr Druce in 1929.

×*M. rubra* Sm., var. *Turreffii*. Var. nov. (*M. spicata* × *verticillata*). Stem stout or slender, according to vigour, flexuous, branching ± under the main inflorescence, purple or green, according to exposure, 2-3 feet high, thinly or rather thickly covered with short deflexed hairs on different plants; internodes 3-5.5 cm. long. Leaves narrowly ovate, obtuse to subacute, rounded at the base or slightly decurrent on the petiole, serrate, thinly sprinkled with short adpressed hairs above, and pilose on the principal veins beneath with longer hairs, sometimes rather densely hairy above or below; superficies 4-5 × 2.2-2.5 mm.; serratures irregular, directed forward, obtuse to subacute, 0.25-1.25 mm. deep; petioles hairy, 5-7 mm. long. Bracts ovate, similar to the leaves, with shorter petioles, very gradually decreasing in size, until they are very small, but always exceeding the open flowers. Pedicels glabrous or thinly furnished with 2-4 jointed hairs. Calyx tube thinly covered with 2-4, rarely 5-jointed hairs, tubular but slightly wider at the teeth; teeth awl-shaped, ciliate with 1-2 rarely 3-celled hairs. Stamens normally included.

The above variety would seem to exclude ×*M. rubra* Sm., but in all respects it resembles ×*M. rubra* Sm., var. *raripila* Briq., with a greater degree of hairiness, but more irregular in having hairs on the pedicels and calyx. In 1929, the Rev. Francis Turreff made a gathering of eighteen specimens within 150 yards of one another on the banks of the classic Mill of Tifty Burn, Fyvie, Aberdeenshire, at a point where the stream is eight feet wide. The previous year he sent some specimens which were very erratic in their leaves. Some of them were densely hairy on the upper face, with rather long hairs, mixed with some mealy pubescence; other leaves on the same stem were densely hairy beneath. In other respects they were like the 1929 specimens.

×*M. verticillata* Linn., var. *ovalifolia* H. Braun, f. *subglabra*. (*M. aquatica* × *arvensis*). The stems and both faces of the leaves of this form are subglabrous, but in all other respects it conforms to an average ×*M. verticillata*, var. *ovalifolia*. The pedicels and calyx are hairy as usual.

I omitted a subglabrous form from previous descriptions in the hope of finding a subglabrous form of the type ×*M. verticillata*, and though I have a sheet from Hurley, near Great Marlow, Berks, 1888, it is not extreme or good. I do not know to what variety John Gilbert Baker attached the var. *subglabra*, but as the varieties were not segregated in British books or lists in his day, he might have been satisfied with any subglabrous form of *M. sativa* Linn. In any case subglabrous forms are most frequent in var. *ovalifolia*, in my experience. My sheet of the f. *subglabra* was collected on the banks of the Thames, below Weybridge, Surrey, in 1898.

NOTES ON ORCHIS PURPURELLA STEPHENSON.

DR T. STEPHENSON.

A few notes are here given on the distribution and forms of *O. purpurella*.

At the original Aberystwyth station, where for some years the plant grew in hundreds, it almost disappeared for some seasons; but has increased in number recently. It has been found near Llandovery, along with some beautiful hybrids with *O. maculata* (aggr.), by Mr W. H. St Quintin.

In the north it grows in great plenty in the Orkneys, and has been carefully catalogued by Col. H. H. Johnston in his contributions to the flora of the Orkneys. Most of the Orkney colonies are dwarf in habit, with a good deal of variation in the method of leaf-spotting. Some plants occur with small, oblong spots, some with rather large, circular spots, and some with spots and rings, as well as the more usual forms with minute spots, or none at all. The plant is found in Canty Bay and the Luffness Marshes, in the Firth of Forth. In Durham, Waldridge Fell is a station.

A fortnight was spent last summer in Upper Teesdale, where the species grows in great abundance. It has been reported as a form of *O. incarnata*. In the form and colour of the lip, it is exactly like the Aberystwyth plants; so that, if it should die out in Aberystwyth, there is no lack of material in Teesdale. It grows in very many stations in Upper Teesdale, and in Lunedale, as well as on the Northumberland side of the fells, on the South Tyne. Everywhere much the same set of forms was to be found, (a) dwarf plants, 4-6 inches high, with minute leaf-spots; (b) taller plants, 6-8 inches high, with unspotted leaves; (c) hybrids with some form of *O. maculata*, usually taller than (b), often with broader leaves, heavily spotted with crimson spots, and flowers of a lighter, brighter purple, often very handsome. These hybrids are not plentiful, but at the same time by no means scarce, and (d) two, possibly three, very beautiful hybrids with *Gymnadenia conopsea*.

As to forms (a) and (b), it may be noted that there is no difference whatever between them in the form, colour of flower, or marking of lip. If (b) be regarded as *O. praetermissa*, var. *pulchella* Druce, and not as an unspotted form of *O. purpurella*, that will not be any real ground for putting down form (a) as a hybrid. It is, quite evidently, a mutant of (b), though which is the form that has varied from the other, it would be hard to say. I still think, as I did years ago, that they are best thought of as "twin-species" differing by two Mendelian factors for "dwarfness" and "spots." On the ground covered in Teesdale, it should be noted, not a trace was seen of *O. praetermissa* (type). Here *O. incarnata* was only seen in one very dwarf colony on Widdy Bank Fell. It may have been a bad year for this species.

A preliminary note may be made on some very interesting colonies of orchids about whose affinities it is very difficult to speak. Mr St Quintin has found, near Rievaulx Abbey, Yorks, a set of marsh orchids of slender habit, with narrow, lightly-spotted leaves, about 6-9 inches high, with lax spikes of small flowers, medium purple in colour, and lightly streaked pattern. The spur is fairly stout, the lip with regular side-lobes, and fairly large, rounded centre-lobe. *O. incarnata* and *O. Fuchsii* are on the spot; but the plants do not appear to be hybrids. They are certainly not typical *O. purpurella*. They might be set down as a slender form of *O. latifolia*. Very much like them, and much more plentiful, is a plant growing at Blackhall Rocks, Durham, where there is also *O. Fuchsii* and a very early-flowering form of *O. praetermissa*. These are under the observation of Prof. Heslop Harrison; and he will no doubt come to some conclusion as to their relations to the other forms. As far as my knowledge goes, they are unlike any forms hitherto recorded.

KASHMIRIAN NOTES.

MAJOR-GENERAL A. B. E. CATOR, C.B., D.S.O.

The fishing was getting poorer and poorer. At the end of each blank day the shikari had fresh excuses. Bright sun and high water were not conducive to sport, added to which, both of us were beginning to feel a bit bored with the house-boat, so we decided to make plans for a camping expedition into the hills. Summoning the head man, we informed him of our decision and he set out promptly to secure coolies and ponies.

Two days later found us sitting on the banks of the Jhelum, in the early hours of the morning, surrounded by a motley crowd, all wanting to lend a hand. Our camp paraphernalia had been ferried over and piled in an untidy heap on the bank. There were camp chairs and tables, tents and bedding, pots and pans, tins and a hundred and one articles lying about, all to be stowed on the backs of six miserable little skeletons, described by the head man as pack ponies; two others, in little better condition, were for riding. How all the kit was going to be loaded to my mind was a puzzle, but the head pony boy seemed unconcerned and was soon spreading out thick blankets with big pocket-like sides, and into these pockets he pushed and shoved convenient-sized loads. Each pony was led up in turn, and the load heaved on his back, to be made fast by a rope encircling the whole. It is always a mystery to me how anything ever gets done in the East. Here were assembled some twenty men, not to speak of women, children and pie dogs, all talking at once, each giving separate advice; some busying themselves undoing work just finished by others, they in their turn retaliating by cries and lamentations; but, marvellous to behold, the whole outfit seemed comparatively ready at the end of some forty minutes. The previous day I had tried the two riding ponies. Their paces were awful, stilty and rough, and the saddles indescribably bad and uncomfortable with a thick wooden bar set up perpendicularly on the pommel. I had now the task of breaking to Nell the class of animal she had to ride. In spite of the animal which she now mounted refusing to go where its head was pointed, and invariably squealing and stamping at any confrere who attempted to join him, she took it very well. For my own mount, words fail me; it was weak, thin, and miserable, and I found walking infinitely preferable.

Leaving Sopor at 9 a.m., we started on a hot five-mile walk fringing the Wular Lake, and reached the foot hills at eleven. Here we halted, watered the ponies, and adjusted the loads before starting the climb. Nell was particularly anxious to see the flowers on the higher altitudes, and on the advice of our head man, Lassoo, our destination was to be a place called Nagmaree, 10,000 feet up. It was two marches distant and some 5,000 feet above the lake. The foot hills for the first three or

four miles were bare and uninteresting. To our right as we climbed was a steep, bare under-cleft, with a mosque perched on its summit inhabited by Mahomedan priests; to our minds they appeared to lead a dull and useless existence, isolated as they were from any human habitation. They guard the shrine of Baba-Shukr-ud-din, a renowned Saint of his time after whom the hill is named.

As we progressed higher the hills became more covered with vegetation, and on reaching a point about a thousand feet from the bottom the path led us into a thick forest of deodars and chestnuts, with occasional walnut and ilex. It was quite a relief to get under their shade, and finding we were some way ahead of the pack ponies and the rest of the followers we called a halt and sat down to have our luncheon. So far, with the exception of one or two isolated flowers, we had come across none of any special interest. Turning back, the Kashmir valley looked lovely, with the fifteen-mile long Wular Lake shimmering in the foreground at the foot of the mountains. From this point the path dipped down into a heavily-wooded valley, and following it for another four miles we came to the village of Rampur-Ragpur, through which we went, to find a nice camping ground with a good spring on the far side. Here there is a Dak bungalow, but we decided to use our tent and not put our faith in the doubtful cleanliness of the rather attractive-looking wooden bungalow.

Barely had we had our tea and settled down before the head man of the village came in and reported a bear to be feeding in the crops half a mile up the hill above our camp. Imagine my chagrin after a stiff climb to find the wrong-sized cartridges had been sent from Lucknow and would not go into my rifle. No amount of language was any good, and I returned disconsolately to camp; from here we sent off a coolie to Srinagar to try and get some others of the right size. A heavy thunder storm came up in the night, but our tent proved equal to the occasion and we kept dry and snug. In the morning we found the tent too sodden and heavy to pack, so we postponed the start an hour to let it dry in the brilliant sunshine.

At nine o'clock we started on a stiff climb, the path zig-zagging up the heavily-timbered slopes from the village. Every step we took brought fresh views to our gaze, the whole getting more lovely as we ascended. On reaching the top we found a wonderful ascending plateau, with a perfect view of the snow-topped Himalayas to the north; to the south stretched the Kashmir Valley. The plateau fell away steeply on both sides; big cedars and ilex trees were dotted in clumps, reminding us very much of English Parks. Here we found the wild peony, in profusion, gone to seed. Under foot the turf was equal to anything I have seen, and was more like that of a first-class golf links than what one would expect to find some 7000 feet up in the wilds of the Himalayas. Under the cedars, meadow cranesbills carpeted the ground, and a very sweet-smelling Spiraea was everywhere in massive clumps, some of it already in seed, its clusters of bright, red berries contrasting wonderfully with those in full creamy bloom.

Further on in the march we made a very steep and rocky descent of some 500 feet, all the way down through a dark wood of cedars and very old yew trees. It took us all our time to keep our legs, and it was nothing short of a marvel to watch our minute, heavily-laden pack ponies stepping down from rock to rock, every now and again putting their hind feet close together to slide down a steep, slippery place and collecting themselves to spring lightly on to sound ground. At the bottom of the descent we halted and had luncheon, and we were both glad to have a rest in the cool shade. After lunch we had a steady climb of five miles, the slope getting steeper and steeper as we went on. As we got higher we came on plenty of fresh flowers. Amongst the many we noticed were the charming little scarlet Nepalese *Potentilla*, many kinds of *Impatiens*, different Stone-crops, St John's Wort, Mullein, Enchanter's Nightshade, Fumitory, Forget-Me-Not, and a host of common English flowers such as Yarrow, Red and White Clover, Bird's-foot Trefoil, Eyebright and Wild Thyme. On reaching the crest of the slope we came out on to a big open sort of downland, short turf on a long, undulating, ever-rising slope. Still ascending, we eventually came to our camp at Nagmoree, a delightful spot tucked under a steep hill heavily timbered with cedar. On a small plateau was a wooden Dak bungalow, with adjacent cook-house and sheds. Below it a very strong spring came bubbling out of the hillside. In the evening there was a most wonderful sunset, making, if possible, the scenery even more beautiful.

We were now 8500 feet up and were glad enough to put on our heavy tweeds as night drew near. Both of us were pretty tired, so we soon retired to bed in our tent. I was awakened early in the morning by Nell rescuing her odds and ends from the entrance of the tent, heavy rain having considerably soaked them. The rain got worse and worse and the cold was making itself uncomfortably felt, so at 8 a.m. we sought refuge in the bungalow for breakfast. Here we soon had a big log fire blazing, over which we sat for most of the morning, regardless of the deluge which continued to come down until one o'clock. After luncheon the clouds disappeared and bright sunshine again flooded the hill, so we decided to explore higher up for flowers.

The fates directed our footsteps wisely, for after climbing for an hour we came to a great rocky crag beneath which we could see the ground ablaze with colour. Here we spent two entrancing hours, climbing about and ever finding fresh specimens as we got higher. Amongst those we came across were *Cynoglossum microglochin* (a hound's-tongue with a very lovely deep blue flower), *Impatiens micranthemum*, *Morina longifolia* (a beautiful Dipsacaceous plant), *Geranium Wallichianum* (a large Crane's-bill), *Potentilla nepalensis*, *Spiraea sorbifolia*, *Hypericum elodeoides*, *Sedum trifidum*, *Impatiens Balsamina*, *Epilobium Royleanum*, *Anchusa*, *Aster molliusculus*, *Sedum Ewersii*, *Spiraea vestita*, *Swertia cordata*, *Lychnis fimbriata*, *Campanula argyrotricha* and *Pedicularis pectinata* (forming a carpet of a most beautiful little magenta pink flower). The lengthening shadows and chilly feeling of approaching evening made us curtail any further searching, and, making our way

along to the eastward end of the crag, we discovered a much smoother and easier descent than the way by which we had come up. It was almost a wrench to leave, and we shall long treasure in our minds the memory of this rock garden of nature. On the way down we came across some *Habenaria*, now faded and over, and a few *Gentiana capitata*. As we were nearing the camp we met my Kumaoni orderly, Bacchi Singh, who, thinking we had missed our way, came out to look for us.

We had been up to 10,500 feet, and it is evident that at this time of the year no flowers grow in any great profusion below this altitude. Returning to camp, my shikari, Satara Khan, said that three bears were reported to be devastating the crops in a village eight miles below in the valley, and as it was on the route of our return journey I sent him off to meet the coolie who was to return there from Srinagar with my cartridges and to gain if possible any further news of the bears' movements. We decided to remain in the bungalow; the sky, in spite of a glorious sunset, looked threatening, and we had already discovered that space for two in an 80 lb. tent is limited. We awoke next morning to find a clear sky and to be greeted by a most wonderful view of the now cloudless mountains and of the valley beyond. Below us, ten miles away, was the Wular Lake with its fifteen-mile stretch of water, and beyond one could see the Jhelum River, a thin silvery thread winding its way through the Kashmir Valley. With the aid of glasses we could even clearly see our house-boat, and noted with chagrin that another had moored close to us. By 9 a.m. the ponies were loaded up and Nell tried several snapshots of them, but the light by then was none too good. Our special comic one is the cook pony, looking for all the world like an armoured snail, covered as she is by pots and pans and other "impedimenta," her small legs appearing from under her bulky load; little else of her is to be seen.

The descent to the valley was not so attractive as the way by which we had come up; the timber was smaller and the hillside smoother. Six miles down we emerged into a cultivated valley, and here we found Satara Khan waiting by the side of the track. I knew the moment I saw his face that things were not well with him, and, sure enough, he had bad news: the coolie from Srinagar had returned empty handed—no .450 cartridges were to be obtained there. To emphasise the bad luck, he narrated at length the number and size of the bears he had seen that night in the crops. Well, it could not be helped. I had only myself to blame in this land of blunders that my cartridges were not all right.

Another hot three miles brought us to the shores of the lake, and Lassoo, our head man, began bargaining for a boat to take us back across the lake and down the Jhelum to Sopor, where we had left the house-boat, distant about twelve miles. An enormous craft, manned by seven lusty Kashmiri, was produced; the ponies, much to the poor little beasts' relief, were off-loaded and the whole of the kit was piled amidship; our followers were packed in "aft," a table and two chairs placed "forrard." "Tiffin," we were informed, was to be served en route. Whilst waiting for the boat to be loaded Nell took a smaller one and went

across to see the sacred *Lotus*, acres of which were growing some eighty yards out from the shore. One can hardly describe the beauty of this flower, which is some nine inches in diameter, its petals a lovely pink, shading to yellow at the base, with huge receptacle of bright yellow in the centre. Unlike a Water Lily, the flower does not float, but stands up some two feet from the water; its huge leaves, two feet across, floating in tangled masses, form seemingly solid green platforms in every direction.

Soon after the start we discovered the heat of the sun to be almost unendurable and a canopy was erected on two punt poles with blankets. A lunch of cold chicken and ginger-bread nuts, and then, in spite of the beauty of the lake, we dozed off, to wake and find ourselves entering the Jhelum three miles above Sopor.

FLORA'S LEAGUE.

MAURICE ABBOT-ANDERSON, K.C.V.O.

I take great pleasure in penning the following particulars of the above League, which I founded last June for the protection and preservation of Wild Flowers in the British Isles. At the same time, it is a healthy sign that I have received correspondence even from Malta, and have sanctioned the formation of a branch in that Island.

On all sides there is definite evidence that now is the psychological moment to "make a noise" in order to attract attention to this important matter, and to achieve something practical. The County Councils' Association, recognising disaster staring us in the face, recently deemed it necessary to pass a bye-law to protect their respective county floras against vandalism. This followed on the example of Hertfordshire and stands to the credit of that county, and I trust it will be universally copied.

We of Flora's League are not kill-joys! There is no reason why children visiting or residing in the country should not freely pick dandelions, daisies and buttercups to their hearts' content if they wish to do so, but the League would teach them unselfishness even as regards these common flowers.

Every County Council should issue its own directions in particularising as to the necessity of protection for this or that plant. For instance, Berkshire and Oxfordshire would under this scheme schedule the Fritillary. Cambridgeshire would do the same for the Pasque Flower, and so on. Each Council could, if it wished, receive expert advice from a reputable botanist, living in the district and possessing intimate knowledge of the exigencies of the situation. There would be no need to indicate the station of a scheduled plant; only the name of the plant and the county need be stated.

There is a consensus of opinion that the chiefest means to obtain a definite and lasting result must be by the education of our children. I am, therefore, anxious to enrol as many children as possible, and to this end (whilst recognising the arguments against), I decided that it was essential to have a badge symbolising the League. The question then arose as to whether a charge should be made for this token, and the definite conclusion was arrived at that if the badge was presented free to each member, it would not be valued at the same worth as it would be if a small charge was made for it. As, however, the primary object is not to raise money, and as I am anxious that every member shall possess a badge, it has been decided to charge for this on a "sliding scale," the maximum to be one shilling, and the minimum a penny. Every badge is sent out in a little box, wrapped in a pamphlet indicating shortly the main objects of the League, as under:—

78 PORTLAND PLACE,
LONDON, W.1.

MEMBERS OF FLORA'S LEAGUE,

Do you know that our Wild Flowers are disappearing? Some of them can no longer be found.

FLORA'S LEAGUE

has been formed to protect them against thoughtless people who are picking and uprooting them faster than they can grow.

Therefore, *wear your badge*, and

Don't pull wild flowers; *cut* them when possible, as pulling disturbs the roots.

Don't *dig up* wild plants; they will not grow in gardens.

Don't pick *early* in the day; they will only wither.

Don't pick *greedily*; leave for others to enjoy as well.

Don't pick *any* specimens of a flower if you know it is rare; leave for seeding purposes.

Please acknowledge the receipt of the enclosed Badge, and if you do not wear it yourself, give it to someone who will promise to do so.

Tell your friends about the League, and ask them to join; there is *no* subscription, and they should write to:—The Secretary of Flora's League, 78 Portland Place, London, W.1.

I am anxious that it should be distinctly and clearly understood that beyond this there is *no* other financial obligation associated with membership.

I am enrolling "all and every" as members, and I am desirous of gradually mapping out the whole country into areas, each with its local secretary, who (it is suggested) besides enrolling new members, will, where possible, act as "guardians" of the rare and scarce plants in each neighbourhood, and use every practicable means to protect them. Will those who are willing to act as Local Secretaries kindly send me their names and addresses, mentioning the possible range of their guardianship?

In order to bring the matter more closely home to the young folk, I am arranging, in association with Dr Green, of Birkenhead, popular lectures with lantern slides. On March 15th last, Dr Green gave such a lecture at the London Day Training College, Southampton Row, London, W.C., under the combined auspices of the School Nature Study Union and the School Journey Association, at which I had the privilege of taking the chair, and it met with a brilliant success. We purpose continuing this propaganda.

I am suggesting to all local branches that when 250 members have been enrolled in any one district, I will make every endeavour to enlist the services of Dr Green to arrange a social evening in that district, and to attend myself to distribute the badges.

I shall be very glad to receive any suggestions, inquiries or applications for membership, which should be addressed to:—The Secretary of Flora's League, 78 Portland Place, London, W.1.

Finally, I would wish to refer to Mr Salt's book, "Our Vanishing Wild Flowers," published last year by Messrs Watts & Co., Johnson's Court, Fleet Street, E.C.4., and which is now in the Second Edition. The book was published with the definite purpose of focussing attention on this menace. The chapters are delightful reading and state the case very clearly. To this little book I was privileged to add an "Afterword," which indicates our activities at the time. I am delighted to say we have advanced by leaps and bounds since this was written.

Flora's League was then only in embryo, but she is now fully fledged and can count several thousands of chicks in her yard. Come and join us!

I feel very confident that if all those who are interested in the cause will give me their loyal co-operation, "Flora's League" will emulate my old school motto:—"Vires Acquirit Eundo."

PERSONALIA AND VARIOUS NOTES.

MR T. W. TAYLOR has been appointed to succeed Mr W. J. Bean as Curator of the Royal Botanic Gardens, Kew.

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 National Museum of Wales, Cardiff, would be glad of assistance in preparing a Flora of Monmouthshire.

THE Secretary of the B.E.C. is anxious to obtain the Secretary's Reports for 1879, 1903, 1909, 1916, 1917 and 1922, and the Distributor's Report for 1926.

CAPT. J. RAMSBOTTOM now succeeds to the Keepership of Botany at the British Museum, Cromwell Road, where we wish him a most successful term of office, and offer him hearty congratulations.

MRS PERRIN, 23 Holland Villas Road, London, W.14, is continuing her beautiful paintings of British plants. Members willing to help are asked to communicate with her.

MR N. WOODHEAD, M.Sc., assistant Lecturer in Botany at University College of North Wales, Bangor, is preparing a new Flora of Carnarvonshire. We wish him every success.

THE veteran, Prof. A. H. Sayce, has been made an honorary fellow of the British Academy and has received the Huxley Memorial Medal of the Royal Anthropological Society.

THE REV. W. KEBLE MARTIN, Coffinswell Rectory, Newton Abbot, Devon, is painting British plants. He would be glad if members would send him fresh specimens. He will supply list.

MR C. H. WRIGHT has retired after 45 years of service at the Kew Herbarium. He was made an A.L.S. in 1896. He began his work at the Oxford Botanic Gardens, going from there to Kew.

MRS ISABEL ADAMS, F.L.S., is painting British Aquatics. Members wishing to help in sending specimens should apply for a list of those wanted to 14 Vernon Road, Edgbaston, Birmingham.

MR J. GORDON DALGLEISH, F.L.S., 50 Tisbury Road, Hove, Sussex, is preparing a Flora of Sussex. Members having Sussex notes are asked to communicate with him, or send in orders for the Flora.

ALBINOS. White-flowered forms or white varieties of *Geranium Robertianum*, *Gentiana campestris*, *Linaria Cymbalaria*, *Convolvulus arvensis* and *Digitalis purpurea* have been found to breed true.

AT the Nottingham Exhibition in the Forestry Section of the Royal Agricultural Show, an exhibit was made by our member, Mr G. J. V. Bemrose and others, for which the highest award of the Silver-gilt Medal in that section was given.

WE are glad to know that the historic and beautiful mansion of Holme Lacy, with its estate, has been given to the County of Hereford by a lady who wishes to remain anonymous. The grounds, through which the River Wye passes, cover 340 acres.

A BRONZE portrait plaque memorial of Sir William Schlich was placed in the School of Forestry at Oxford, on Thursday, May 23. It was unveiled by the Vice-Chancellor, Dr Pember. A portion of oak woodland near Oxford is to be called the Schlich Forest.

MR T. A. DYMES, F.L.S., Carthona, West Drayton, Middlesex, wants ripe capsules of British Orchids, especially *Malaxis*, *Corallorrhiza*, *Cephalanthera longifolia* and *C. rubra*, the Irish *Spiranthes* (north and south), *Listera cordata*, *Epipogium* and *Ophrys Trollii*.

A NEW Sundial has been presented by Prof. C. V. Boys to Kew Garden ("The Times," November 25, 1929) and is a beautiful example of craftsmanship as well as being of scientific interest. The pillar on which it rests was one of the balusters of old Kew Bridge, of which many are at Hartwell Park, near Aylesbury.

On the retirement of Prof. F. W. Oliver from the Quain Chair of Botany, University College, London, a fund was raised to commemorate his work. With the subscriptions an Oliver Commemoration Bursary of the value of about £20 has been instituted for the purpose of assisting graduate research in Botany. Prof. F. O. Bower presided at the most successful dinner given in University College on July 3, 1929.

MR E. W. SWANTON, on July 9, gave a very interesting address at the Haslemere Educational Museum, the title being "Thirty Years Teaching at a Country Museum." This is the Haslemere Museum of which Sir Henry Miers said it was the only effective (other than the National Museums) Educational Museum in the country. In nine examinations since 1898 a thousand children took part and 441 passed.

DR A. H. HILL, C.M.G., F.R.S. (see *Nature*, 133, 1929) lectured on "The Original Home and Means of Dispersal of the Coco Nut." He favours the Indian Archipelago or Polynesia as being most probable, and this is supported by Beccari, who shows that the great robber crab, *Borgus latis*, used the husk of the nut to line its burrow. The sea is one of the great means of dispersal, the nuts being ocean-borne for great distances.

BROTEX. Some sensational statements have been made as to the value of this plant as a source of fibre cellulose for paper-making, and seed for cattle cake. In the course of fifteen or sixteen months it is said to attain a height of about 16 feet and a girth of 8-10 inches. A firm of analytical chemists say that it gives a yield of 39 tons per acre of cellulose, worth about £15. Up to the present the name of the plant has not been revealed to me. It is said to belong to the Malvaceae.

THE CITY OF LEICESTER MUSEUM (E. G. Lowe, Ph.D., B.Sc., Director). —At the University College is being formed a collection of living plants arranged according to the Families by Mr G. J. V. Bemrose, the Museum, Leicester. He is very anxious to obtain seeds and specimens of British plants, and it is trusted that our members will assist him. We may add that the annual cost of the Museum is £7042, of which £6680 comes from the rates. The attendance of visitors for the year had the satisfactory total of 284,334.

DOWN HOUSE. The home of Charles Darwin from 1842 till his death on April 19, 1882, was officially presented by Mr Buckston Brown, F.R.C.S., on June 7. The meeting was largely attended. Sir William Bragg thanked Mr Buckston Brown for his national gift to the British Association. Sir Arthur Keith declared the building open. Already much furniture and many articles connected with Darwin are replaced in this beautiful house. Dr Joseph Leidy and Prof. R. Anthony also spoke on behalf of the United States and France. The Secretary represented the Botanical Exchange Club on the auspicious occasion.

DR N. LORD BRITTON has retired from Bronx Park, New York Botanical Gardens, which, under his supervision since 1896, have been raised from a waste to what is said to be the third largest Botanical garden in the world. So popular are they that the average Sunday attendance is over 50,000. During the vacations, Dr and Mrs Britton have made over twenty excursions to the West Indies, the known Flora of Trinidad especially has been much enlarged by their industry. His magnum opus, prepared in collaboration with Mr J. N. Rose, is the four volumes on the Cactaceae, produced for the Carnegie Institute. Dr Britton and Mrs Britton are spending the winter in the West Indies. Dr Britton is succeeded at Bronx Park by Elmer Drew Merrill, Dean of the College of Agriculture in the University of California.

NATIONAL TRUST FOR PLACES OF HISTORIC INTEREST OR NATIONAL BEAUTY, 7 Buckingham Palace Gardens, Westminster. Report, 1928-1929, pp. 131. With views of Stonehenge, Wall End and Stoot End Farm, Great Langdale; Cockley Beech Farm in the Duddon Valley; Bee Holme, Windermere; the view north from Post Knott; the Lion Rock, Cheddar and the Bridge House, Ambleside. In addition to these properties the Trust has also acquired land in Great Langdale, Castlebarrow Head, Silverdale (27 acres), Dover's Hill, Gloucestershire; 64 acres of land at Whipsnade, Herts; the Moat House, c. 1500; Earlswood,

with 50 acres of land. It is gratifying to know that there are now over 1000 subscribers. Our member, the Hon. Oliver Brett (Lord Esher), has given a most magnificent donation of £1000 to the general endowment fund, and Prof. G. M. Trevelyan, in addition to land, has given £1650 for Doren Hill. There was also a donation of £20,000 towards the purchase of the Ashridge Estate.

WILD FLOWER PROTECTION. On another page will be seen an appeal on the subject from the Floral League. A mass of correspondence has occupied the pages of " The Times " and other newspapers. Conferences have been held and legislation is asked for. At present we believe a Bill is being drafted for the purpose. More than forty years ago I took part in the movement and Lord Avebury drew up a circular asking the Natural History Societies in Britain for their support. Curiously enough this was not forthcoming and we could not get enough outside support to warrant going on with the Bill. Since that time the spread of Nature Study has increased the necessity for some scheme of protection and if possible to educate the teachers to be careful that their charges do not gather too freely and always avoid plucking roots. The Bishop of Gloucester wrote a very wise letter to " The Times " on the subject. It does, indeed, seem that it is time that protective legislation should be passed; but its application is surrounded with difficulties. Mere protection without a penalty would be useless. It would perhaps be best for each county to frame a list of seven to ten plants which should not be rooted up and sold by hawkers. This might be extended to include the ferns—save the Bracken, of which our Midland woodlands are now nearly denuded. In the counties immediately under my survey it would seem wise to schedule *Anemone Pulsatilla*, *Daphne Mezereum*, *Leucojum aestivum* and *Fritillaria*. But perhaps it might be found easier to schedule areas rather than specific plants. Despite all that has been said about depredators the greatest harm has been done by building or reclaiming operations. This was long ago felt to be the case by the Hon. N. C. Rothschild and others, and it was for that reason that the Society for the Preservation of Natural Areas was founded. With him, we drew up a schedule of places that it was most desirable to acquire, or have protected, and for that purpose I visited the greater part of the British Isles. The results are preserved in the archives of the Society. This Society, under the Presidency of Viscount Ullswater, has issued thousands of handbills with the view of lessening the wholesale destruction which goes on around us.

BRITISH SCIENCE GUILD.—A meeting of the British Science Guild was held in the Mansion House, London, E.C.2., on April 24, the Right Hon. Lord Melchett, D.Sc., F.R.S. (President), in the chair. The Chairman, in opening the proceedings, briefly indicated the scope of the three addresses that followed. The problem of the production of artificial fertilisers, his lordship pointed out, was not entirely new. In 1881 Dr Ludwig Mond had indicated the importance of the researches of Lawes

and Gilbert. In 1880, South America exported 750,000 tons of nitrate: the same country now exported approximately 2,500,000 tons per annum, and yet the output of the synthetic product far exceeded that of the natural salt. Billingham produced in 1928 eight times the output of 1924 and four times that of 1927. This year it was hoped the total would reach 750,000 tons. After a brief reference to the foreshadowing of artificial silk by Hooke in the latter part of the seventeenth century, Lord Melchett called upon Sir Frederick Keeble to give an address on "Fertilisers from the Air." The speaker gave an estimate of the almost unlimited quantity of nitrogen in the atmosphere—4,000-million-million tons. Mixed with chalk (which was a by-product at Billingham) ammonium nitrate formed a valuable fertiliser. The year 1913 marked a dividing line in the history of the world: prior to that time plants were limited in their supplies of nitrogen, but with the advent of synthetic nitrate all was changed. One great cause of a lack of prosperity was thus removed. Holland and Belgium led the world at present in the increased use of nitrogen. Holland consumed about 38 lb. of nitrate an acre, Germany about one-third of that amount, Great Britain less, France less still, and the United States only 1.8 lb. Japan, Java and Egypt were great users, and China had increased the consumption by more than 1,000 per cent. during the last few years, while India was just beginning to awaken in that respect. Concentrated fertilisers were now being made—an obvious boon in districts where transport was bad. The British had in this industry a new and great opportunity. The second address, delivered by Mr A. B. Shearer, was entitled "Rayon (Artificial Silk)." The following is an abstract:—"Rayon is the generic name of the filaments produced by any of the recognised processes: 'artificial silk' is a misnomer. The rayon industry is already more than three times the size of the silk industry, and ranks only after those of cotton and wool. Sir Joseph Swan devised filaments of this material in 1883 for his gas-filled lamps, and two years later exhibited fabrics made from his yarns. Numerous patents have been granted for different processes. The large-scale manufacture of this product had important reactions on the chemical industry, and engineering had also been stimulated. The commercial product was now so finely spun that 1 lb. made 170 miles of thread, and rayon could be spun much finer than silk. It was estimated that the industry employed 300,000 workers. In 1928, 50,000,000 lb. of rayon were produced in this country."—*Chemist and Druggist.*

BELLADONNA IN A SEAL.—Amidst the wreckage remaining from the Tudor spoliation of the monasteries are the instructive deeds of surrender, with their signatures and attached seals, which gave due transfer to one whom Leigh Hunt, with his peculiar aptness for terse statement, calls (in his "The Town") "the most bloated enormity" that ever misused such glories. Amongst these seals is one of direct interest and application to pharmacy, the one attached to the instrument which conveyed to a cupidinous monarch the possession of the great Cistercian Abbey of Furness in the northern portion of the county of Lancaster.

The interest is the incorporation of belladonna, in the form of the leaf, as an integral portion of the seal of this abbey. The reason is perhaps not apparent to those who are not acquainted with the local topography and flora of the hundred of North Lonsdale. The estuaries of the rivers in the southern portion of the Lake District are still the home of many long patches of deadly nightshade, where, owing to the shingled beaches, the plant is protected from ravages of slugs. Alas! spoliation and other causes are robbing even these parts of many of our rare plants, and amongst them belladonna. Furness Abbey is located in "Beckang's Gill," a characteristic local name, otherwise the "Glen or Vale of Deadly Nightshade," a short distance from either Dalton-in-Furness or Barrow-

in-Furness. The immediate neighbourhood, where the becks run red with iron ore, was characterised by a luxurious growth of this native plant, and hence in a measure may be found an explanation for the incorporation of this phyllomorphic design as a portion of the seal. The slightly damaged seal is about 1¾ inch in diameter, and a characteristic type of fourteenth-century design. Some years ago a friendly local antiquary gave me a lantern slide of the seal, and from the reproduction the essential details can be traced. The outer circle bears the following inscription (transcribed in full):—Sigillum Commune Domus Beate Marie de Furnesio (The common seal of the house of the blessed Mary of Furness). Note initially the three beautiful cusped and pointed arches, most exquisite examples of the engravers' art; the mouldings, terminating on each side in a lion's face; then particularly examine the contents of these arches. In the centre one is a figure of the Virgin Mary, over whom is the canopy of heaven studded with stars; on her left arm rests the infant Christ surrounded by a halo of glory, whilst her right hand grips the globe, proclaiming her as the Queen of the World. From the apices of the outer arches sprigs of belladonna are suspended and hold coats of arms. These shields suggest material and physical protection by being on each side; the dexter or right-hand shield bears the arms of

England, being those of King Stephen when Earl of Morton and Boulogne about A.D. 1127; the sinister or left-hand shield is again that of England with a label of three points, perhaps for Thomas Plantagenet, second Earl of Leicester, and commemorating his many benefactions to the Cistercian order. Beneath these are two monks in full dress and cowl, apparently walking upon the same earth upon which the Blessed Virgin stands and from which belladonna is growing. The base of the seal contains a representation of the wyvern, an imaginary animal with the forepart of a dragon, the tail of a scorpion, and the feet of a bird, with wings expanded. The wyvern will be familiar to visitors to the Conference at Leicester as a portion of the arms of the city. Doubts have been expressed as to the leaves being representative of belladonna, but a careful examination will leave no doubt that the outline of the foliage is solanaceous. The British Museum Catalogue of Seals, Vol. 1 (1887), page 561, No. 3177, contains particulars of this seal, and is worth consulting by those interested.—By permission of the proprietors of "The Chemist and Druggist."

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