THE BOTANICAL SOCIETY AND EXCHANGE CLUB OF THE BRITISH ISLES.

REPORT FOR 1922

(WITH BALANCE-SHEET FOR 1921)

BY THE

SECRETARY,

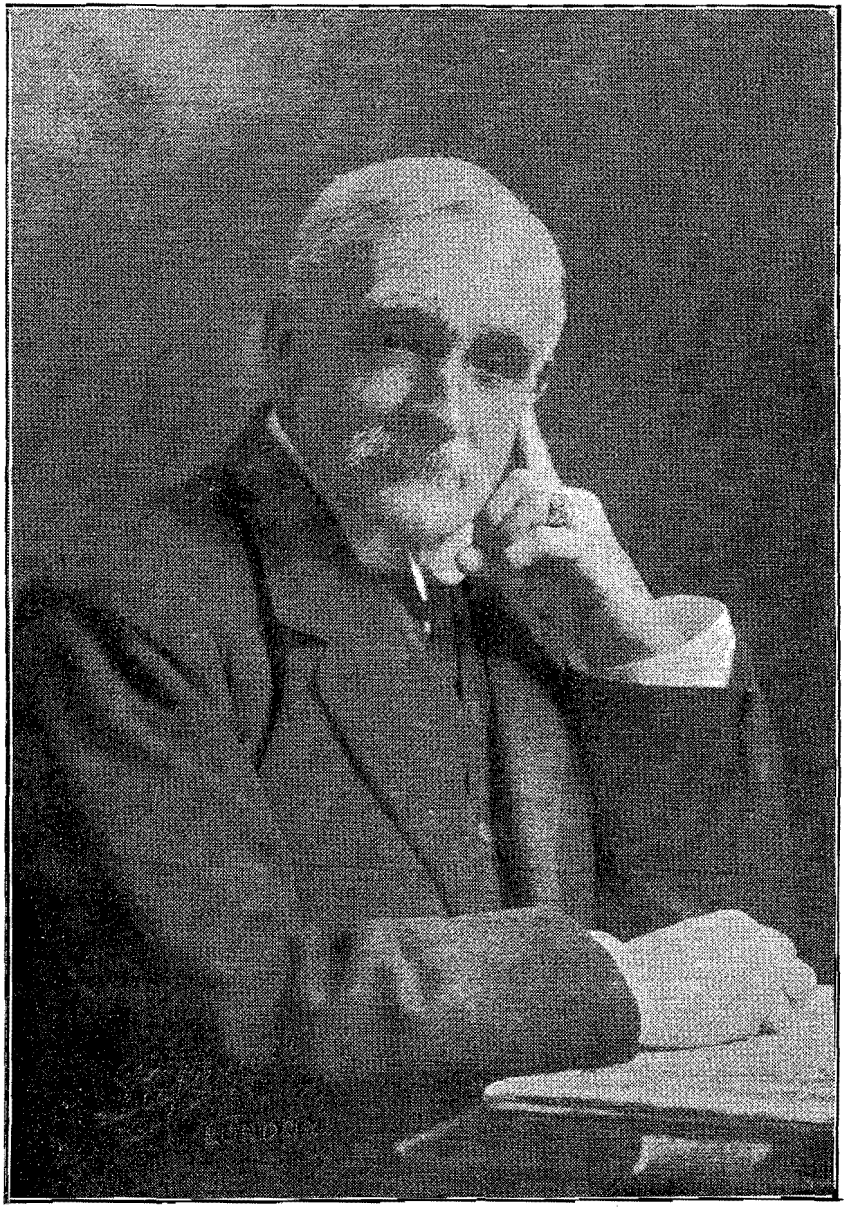
G. CLARIDGE DRUCE, LL.D.

VOL. VI. PART V.

PUBLISHED BY
T. BUNCLE & CO., MARKET PLACE, ARBROATH.

May 1923.

PRICE 10s.



(Photo by Lafayette).

G. CLARIDGE DRUCE.

THE BOTANICAL SOCIETY AND EXCHANGE CLUB OF THE BRITISH ISLES.

(VOL. VI. PART V.).

Victoria Regina

Floreat flora

REPORT FOR 1922

BY THE

SECRETARY,

G. CLARIDGE DRUCE,

to whom, at YARDLEY LODGE, 9 CRICK ROAD, OXFORD, the Subscription, 12s 6d per annum, and Non-Contributing Member's Subscription of 10s per annum, should be paid on and after January 1, 1923.

Exchange Club Parcels for 1923 should be sent, post paid, on or before 1st December 1923, to

C. V. B. MARQUAND, Esq., M.A., F.L.S.,
102 Mortlake Road, Kew Gardens, Surrey,
who will act as Distributor and Editor of the B.E.C. Report.

PRINTED BY T. BUNCLE & CO., ARBROATH.
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PRICE 10/-.

(The Editor does not hold himself responsible for Statements in Signed Contributions.)

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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 1922.

BALANCE-SHEET FOR 1921.

Subscriptions received, -	£203	14	0	Adverse Balance from 1920,	£ 7	18 11
Sales of Reports and Advertisements, - -	18	17	6	Printing Reports, - -	150	0 0
Donations (Jenkin & Britton),	6	0	0	Expenses of Distribution,	3	2 0
				Postages, Carriages, Foreign Critics, &c., - -	23	16 0
				Benevolent Fund, - -	20	3 10
				Balance, - - - -	23	10 9
	£228	11	6		£228	11 6

Life Members' Fund, invested (at cost), £64 15s 6d.
Audited and found correct, January 12, 1923.—F. TWINING.

Since 1902 we have received for the Benevolent Fund £145 8s. We have disbursed for a member who was in temporary distress £20, to complete the education of the son of a member £30 5s, for a case of distress £5, for a presentation to a foreign helper £12, and other disbursements £48 13s. Balance in hand £28 10s.

The subscriptions—Ordinary Members, 10/-; Exchange Members, 12/6—are due, and should be paid on the first of January each year to G. C. Druce at the above address. Payment in advance for two or more years saves trouble and expense. Entrance fee for New Members, 5/-.

The Exchange Members are grateful to Miss E. N. Thomas, D.Sc., Miss Vachell, F.L.S., and Mr A. E. Wade for editing the Exchange Club *Report* and distributing the 4836 specimens collected in 1921.

The present season has not been a favourable one for the Field Botanist. The dry and hot early June threatened another drought but the rain soon came in too great quantity, and over too long a period. The cold temperature in Scotland, too, was inimical. Probably, however, no year has witnessed such a copious and magnificent display of Hawthorn blossom in our hedgerows, and the subsequent crop of haws was equally profuse. The fruit of the *Rhamnus cathartica*, *Ligustrum vulgare*, *Sambucus nigra*, and *Euonymus* were also in splendid show. The fruits of the Beech, Lime, Maple, and Hornbeam were produced in such plenty as I have never seen before. Mr W. H. St Quintin, writing from E. Yorkshire, said :—" We have a greater crop of Beech Mast than anybody can recollect; branches of trees weighed down and even broken by the masses of fruit. Some individual Oaks also very heavily laden but neither Sloes or Bullace seem to have set fruit." Doubtless the hot summer of the previous years was the primary cause of this wealth of blossom and fruit in our shrubs and trees.

We have no new Linnean species to chronicle this year such as *Tillaea aquatica* which was discovered in Yorkshire by Mr Butcher in 1921. There are, however, some interesting extensions of range in plants to record—notably *Poa bulbosa* and its var. *vivipara* from Pontac, Jersey, where Lady Davy found it. She also has found *Habenaria virescens* in Jersey which is practically a new record. Mr Christopher Cookson also found *Romulea* in Gower, a new plant to the Principality. I am grateful to Mr T. Gambier Parry for allowing me to have the specimen. *Phyteuma spicata*—as the blue-flowered form—was found in a pasture near Dolgelly, Merioneth, by Mrs Richards. We await further investigation as to its history. Miss Todd has now definitely discovered *Fumaria muralis* near Mevagissey, Cornwall. The name is verified by Mr Pugsley. Last year Mr J. E. Little found *Alnus incana* near Hitchin, but it appears likely to have been planted there. This year the Rev. W. Wright Mason brought me some plants to examine and among them was a specimen, much more like the Norwegian examples, which he gathered near Melmerby in Cumberland two years ago. It is the Common Alder of Norway and hybridises with *glutinosa*. Last September Mrs Wedgwood and I visited Galway, Clare and Kerry. In addition to the interesting hybrid of *P.*

coloratus and *pusillus* which is the old *P. lanceolatus*, var. *hibernicus* of the *List* we added a new Pondweed to the British Isles, *i.e.*, *P. Seemenii*, a hybrid of *polygonifolius* and *gramineus*. In Jersey I was fortunate enough to add another new hybrid, namely, *P. spathulatus* Schrad., and from Spiggie, Shetland, a new form of *P. nitens*, *i.e.*, *flumineus* Hagstr. Mr Thurston has found what seems to be a new variety of *Serratula tinctoria* in Cornwall, and he has also sent me from Biscovey an entire-leaved form of *Crepis taraxacifolia* which Miss Trower and I also found at Ware this year and which I am naming var. *subindivisa*. Mr John Cryer has found several new Aliens near Bradfield. Several espartal Aliens from Leith have been added by Mr John Fraser. We much regret his health-breakdown and trust he may soon recover. Mr Grierson has added some also from the Glasgow area, and Mr R. Smith has found several South European species near Radyr, Glamorgan. The means of the introduction of the South European species is somewhat uncertain although they are supposed to be carinal, *i.e.*, ballast plants, but I am assured no ballast is now brought there.

Death has been busy in our midst and has robbed our ranks of that veteran, hard-working, field botanist, the Rev. E. A. Woodruffe-Peacock, an original investigator and patient accumulator of details of plant-occurrences in Lincolnshire—a real pioneer in ecology. Viscount Bryce, eminent in so many ways, who wrote a Flora of the Isle of Arran so long ago as 1859; Canon John Vaughan of Winchester, a genial and elegant scholar; the many-sided and brilliant speaker and enthusiastic horticulturist, Viscount Harcourt; Mr A. S. Montgomrey, who died at Trowbridge in April; Mrs Grey, of Peppard, who died in the south of France; Mrs Berkeley, of Spetchley Park, a devoted friend of the poor and a talented gardener; Richard L. Burton, of Longner Park, Salop, a very successful cultivator of the British Orchids, and a great book-lover; and Mr Albert Ernest Hall of Cranfield House, Southwell, have passed from our midst. Dr J. Hagström, of Sweden, one of our most valued Honorary Members, died on the seventh of June, never having recovered from an operation he underwent. He was the recognised authority on the Pondweeds of Europe. His brilliant suggestion about the origin of the Hibernian *Potamogeton lanceolatus* has been alluded to in our *Report*. We were enabled to gather

the second parent *coloratus* growing with it, and this verification of his suggestion came to him on his bed of sickness and was most grateful to him.

Outside our ranks the botanical world has lost Mr Carruthers who for many years was the Keeper of the Botanical Department of the British Museum; Professor G. S. Boulger, who compiled several botanical works and was a Lecturer at the City of London College; Professor W. B. Bottomley, who so short a while ago relinquished the Chair at King's College; Mr J. F. Duthie, who did some good work at the Indian Flora; Prof. Sir I. B. Balfour, a most distinguished member; the eminent French botanist, Prof. Bonnier, and others.

We offer our sincere congratulations to our veteran member, Lord Leverhulme, on his promotion to a Viscounty; to the Hon. Mrs Mildmay on the elevation of Colonel Mildmay to the peerage; to the Sherardian Professor of Botany, Dr F. Keeble, and to Dr E. J. Russell, of Rothampsted, on their knighthoods, also to Prof. J. B. Farmer on his Edinburgh degree of LL.D.

Our foreign experts have, as usual, been most kind. We are greatly indebted to Dr Albert Thellung of Zurich for his splendid help; to Dr E. Almquist for identifications of the Shepherd's Purses, some being new to Britain; to Dr J. Murr for examining the Chenopods; to Mr H. Dahlstedt for examining our Dandelions, and for the diagnoses of several species new to science. Prof. C. H. Ostenfeld, the lamented Dr J. Hagström, and Prof. Holmboe have also rendered assistance. We are very grateful for the literary help given by Dr S. H. Vines, F.R.S.; T. R. Gambier-Parry, M.A.; and Rev. F. Bennett, M.A., and to Mr and Mrs Corstorphine for their help in the arduous task of proof-reading.

The membership, large as it is, we should like to see increased, since the loss by deaths, etc., is very large. The experience of most Societies is that there is about a ten per cent. annual loss in membership; so that we in our Society need over fifty new members each year to make up the deficiency.

Our new members include:—The Right Hon. H. Baker, Miss E. M. Blake, W. Biddiscombe, *C. J. Bond, M.R.C.S.; *Mrs Bowlby, Miss Ruth Bright, Miss Barbara Buckler, the Countess Buxton, J. Campbell, the Countess of Carlisle, F. Clarke, R. B. Cooke, Miss

David, F. M. Day, J. H. Dixon, *W. Evans, *Mrs Sanderson-Furniss, J.P.; H. J. Gibbons, A. J. Gibson, M.D.; Sir Rickman Godlee, K.C.V.O.; Captain A. W. Hill, D.Sc., F.R.S.; C. E. Hodgkin, Dr J. Holmboe, J. A. Holmes, *Rev. S. Laing, M.A., Mr Luddington, The Melbourne Library, The Viscountess Northcliffe, Dr J. Parkin, Faculté de Pharmacie de Paris, J. Pickard, B. Reynolds, Mrs Richards, *J. Rose, M.A.; R. J. Ryle, M.D.; the Baron Bruno Schroeder, H. K. Airy Shaw, W. Shaw, W. Simpson, N. Douglas Simpson, South London Botanical Institute, R. Snow, B.A.; Dr O. Stapf, Mrs Stokes, C. B. Tahourdin, Miss Ethel Thomas, D.Sc.; W. A. Todd, Professor Troup, Sir H. J. Veitch, Miss Elsie Watchorn, M.P.S., W. Van de Weyer, and W. C. Worsdell. (* signifies joined in 1923.)

This year I have been able to send to Louvain for the Botanical Department of the University nearly three thousand sheets of labelled British plants as our offering, and as a token of our sympathy in their loss. Mr C. Bailey, Mr J. E. Little, and the Secretary were the chief contributors. The carriage has rather swollen our expenses. The Rector of the University, Dr Ladenze, has sent a very grateful letter in acknowledgment.

My own work at British plants suffered owing to my absence from England for a month in the spring, when Avignon was visited. Then it was more than usually picturesque owing to the immense floods in the Rivers Rhone and Durance, which had swollen to lake-like dimensions. It was sunny enough when we were there, and the clear atmosphere brought very near to us Mont Ventoux and Carpentras, the scene of Fabre's historic researches into the mysteries of insect-life. At Mentone it was rather cold and dull, and the only fresh plant seen was the pretty *Leucojum hiemale* which, unlike *vernum* and *aestivum*, delights in arid spots. At Florence and Pisa it was bitterly cold, but a more genial temperature, chequered with heavy thunder-storms, met us at Perugia, a lovely place amid pleasant surroundings. In the Umbrian plain, near Assisi, grew a yellow-flowered *Polygala*, the local *P. flavescens*, associated with *Orchis Simia* and *purpurea*. My Italian visit was made primarily to see the Herbarium of Aldrovandi at Bologna, and a separate note on it will be found in another part of this *Report*. We returned to Britain by Mont Cenis, Paris, and

Havre. In June a fortnight was spent in Holland, when I greatly enjoyed the hospitality of the Isle of Walcheren, of the Hague, Haarlem, Leyden, Delft, Rotterdam, and Amsterdam, so generously given us by those places. We stayed for some time at the Grand Hotel at Scheveningen, from which we were taken in motors over a considerable part of the country, but little time was allowed to the botanist. The dunes were covered in places with *Polygonum multiflorum*, growing with *Asparagus*, a somewhat curious habitat for a woodland species. There, too, grew the English *Sedum*, which Graebner named after me. *Silene Otites* was not uncommon, and *Bromus tectorum* was frequent along the railways. *Matricaria suaveolens* has established itself, and in marshes we saw *Orchis praetermissa*. The ditches had an abundance of *Stratiotes*, *Butomus* and *Hydrocharis*. Then five weeks in July and August—a great slice out of a poor summer—were spent in Norway. In March I visited Stogumber, under Mr Miller's guidance, to see the station of *Leucojum vernum*. It looks wild as it grows with *Chrysosplenium alternifolium*. The extent, however, is very limited, and it is therefore difficult to decide upon its indigenity. In May, with Miss Trower, Cherry Hinton was visited, and in Herts, at Gilston Park, the seat of Mr Bowlby, we found some good tufts of *Carex elata*. Later we noticed other clumps near Broxbourn Woods, so that it cannot be so rare as is suggested in the *Flora of Herts*. At Ware we found a new variety of *Papaver Argemone*, and another of *Crepis taraxacifolia*. A visit to Ray Island in Essex was also made. In June I stayed at Newtimber, and Lady Buxton took me to St Leonard's Forest, where we saw *Melittis* in beautiful flower, and, in a hedge near Albourne, where it has been known for over half-a-century, *Lathyrus odoratus*. Then I went to Chichester, and, with Prebendary Burdon, explored Hayling Island, where Miss Hillard guided us to *Cynosurus echinatus*, which has appeared there recently. We saw *Orchis hircina* near Goodwood. In July I went to Patshull, and, despite the inclement weather, Lady Dartmouth took me to Bridgnorth, Much Wenlock, and Buildwas Abbey. Near the Abbey grew *Scrophularia alata*, *Orchis O'Kellyi*, and, quite naturally near Patshull, *Geranium Endressi*. Later I went to Sir Roger Curtis' at Lichfield, and in dreadful weather explored Needwood Forest with

poor results. With Father Reader and my host we went to see what was once a saline area in Staffordshire, but it contains now no maritime species. *Potamogeton Lintoni* and *P. Cooperi* still grow in the canal at Lichfield, dirty though it is. In September Essex was visited and *Mentha alopecuroides* was noticed at Little Maplestead and *Filago gallica* in its old station at Berechurch. A rapid journey was made from Byfleet to the New Forest with Lady Davy and Mr Williamson, and *Ludvigia* and *Pinguicula lusitanica* were both seen in flower. In October I stayed at Westonbirt to see the splendid display of autumnal tints in the foliage of the wonderful collection in Sir George Holford's Arboretum and grounds where the catalogue, which Mr A. B. Jackson is preparing, contains already about 1800 names. Not only is there an enormous variety but the individual specimens are so fine and so tastefully arranged that I suppose elsewhere in the world there is no such display. To see a Japanese Maple in its soft orange-red glories backed up by the lucent green pillars of *Cupressus macrocarpa* or the dainty loveliness of *Cercidophyllum japonicum* against a background of sombre pines is a memory that will long remain. Nor are the glories of Westonbirt limited to the Arbores. There was about a quarter of an acre of *Campanula patula* and in the 27 Orchid houses were some of the finest Orchids of their race. It is not everyday of one's life that one can sit on a sixteenth century Pope's throne from the Strozzi Palace and warm oneself at a fire of Mexican pine-cones, while two of the finest Rembrandt's in Britain look down upon one from the walls. Just as the richness of the background of *Cupressus* is to the *Cercidophyllum* or the *Acer*, so too, to these objects of interest and beauty, is the kindness of Sir George and Lady Holford. As late as November I was enabled to show the Misses Cobbe *Stachys germanica* and *Sisymbrium Irio* in flower, and in the same month Mr Noel Sandwith took me to see *Filago spathulata* and *apiculata* also in flower in Berkshire.

PLANT NOTES, ETC., FOR 1922.

(Mostly New Plants to the British Isles, or Notes on British Species inserted here for convenience of reference.)

ABBREVIATIONS.—† before name signifies the plant is not native; × = a hybrid; ! after a locality, that the Secretary has seen the plant there; brackets [ ] 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.* = *Journal of Botany*; *Nat.* = *Naturalist.*

9. ANEMONE NEMOROSA L., var. MARGINATA J. Henriksson in *Bot. Not.* 103, 1922.

RANUNCULUS, FOSSIL. In an interesting letter to *Nature* (136, 1922) ELEANOR M. REID mentions that the oldest carpel she has seen belongs to *Ranunculus galiensis* from the base of the Pleiocene at Pont de Gail, Cantal, where, in another locality, a second species closely related to *R. fluitans* occurs, the *R. atavorum* Sap. In the latest Pleiocene of the Cromer Forest-bed all are British species save two undetermined carpels. In the Middle Pleiocene of Castle Eden a form of *R. sceleratus* is found.

48. CALTHA PALUSTRIS L., var. PARVIFLORA F. Gerard Notes, p. 6. Under this probably come some plants sent by Mr G. C. BROWN from Newton-by-Castleacre, W. Norfolk, in 1921 [Ref. No. 1886], which he referred to var. *minor* DC., but that plant is decumbent. To *parviflora* probably goes Mr RIDDELSDELL'S plant from Penyfae, Glamorgan, although that has a procumbent habit. Both plants are worth cultivating.

54. AQUILEGIA VULGARIS L., forma MONSTROSA. Miss ROBINSON sent me a specimen from St Leonards Forest, Sussex, in 1922, in which the floral organs were abortive or foliaceous. The upper

bracts, too, were simply trifoliate, with entire margins. Subsequently, with the Countess Buxton, the habitat was visited, but it appears to have been a solitary example of an accidental monstrosity.

67*b*. ACONITUM CAMMARUM L., var. STOERKIANUM (Reichb.). Alien, Europe. Hortal. On rubbish at sea-shore, Hamis Voe, Stromness, Orkney, 1920, H. H. JOHNSTON in *Trans. Bot. Soc. Edin.* 53, 1921.

81. PAPAVER DUBIUM L., Meristic variation in. T. A. SPRAGUE in *Journ. Bot.* 299, 1922.

83. P. ARGEMONE L., var. CONTIGUA, nov. var. On rubbish heaps near Ware, Herts, June 1922. This differs from type *Argemone* by having much larger, broader petals which overlap and are of a deep crimson colour (as in *hybridum*, but slightly darker), with a dark blotch at the base. There is no sign of hybridity with *hybridum* as the capsule is normal *Argemone*, and the leaves, too, are similar to the type. It is probably of foreign origin since it grew with other European or Eastern plants. I am unable to match it in our National or Oxford Herbaria. In Fedde's Monograph (*Das Pflanzenreich* 328) a *P. Virchowii* Aach. & Sinten. It. Trojanum 37, 1883, is described, which also has petala 'late, obovata,' but that differs in essential characters and, therefore, I prefer to leave the plant as a variety of *Argemone*. G. C. DRUCE.

86 (3). P. ORIENTALE L. Alien, Orient. Hortal. Waste ground, Dundee, Forfar; Bullingdon, Oxon, G. C. DRUCE.

98 (3). CAPNORCHIS SPECTABILIS (L.) Borck. *Fumaria spectabilis* L. *Dicentra spectabilis* Ch. Lem. in Pl. des Serres iii., t. 258, 1847. *Diclytra spectabilis* DC. Syst. ii., 110, 1821. Alien. Hortal. This elegant Japanese and Siberian plant, which has been in cultivation in Britain since 1816, was noticed by Lady Charles Bentinck this year as rampant in the woods of Brogyntyn, the seat of Lord Harlech, near Oswestry in Shropshire. The oldest name for the genus is *Capnorchis*, which was given it by Miller (*Abr. Garden. Dict.* 1754), with one species, *C. americana*. This binomial

is accidental since Miller in this edition does not consistently follow the binomial system. Later, in 1763, Adanson (*Fam. des Plantes* ii., 23) called it *Bikukulla*, which Jussieu (*Steud. Nom.* ed. 2, i., 202) changed to *Bicucullaria*, with a species *B. canadensis*. In the *American Check-List* of 1893 Adanson's name is adopted but the spelling varied to *Bicuculla*. In 1808 Rafinesque (*Med. Repos. New York*, v., 352) gave it the name *Cucularia*, which is written *Cucullaria* by Endlicher in his *Genera* of 1839. Rafinesque in his *Catalogue* of 1824 used the name *Diclythra*, a variant of Borckhausen's *Diclytra*, which he established in Roemer's *Archives* i., 46, 1797. Again, another spelling, *Dieclytra*, often followed by horticulturists, was given by Chamisso and Schlechtendal (*Linnaea* i., 556, 1826). De Candolle (*Syst.* ii., 108, 1821) called our plant *Diclytra spectabilis*, taking the specific name from Linnaeus' *Fumaria spectabilis* (*Sp. Pl.* 699, 1753). Yet, notwithstanding the existence of two much older names, the *Index Kewensis* gives as the valid generic name *Dicentra*, which only dates from 1833 (Bernh. in *Linnaea* viii., 457). On the ground of priority *Capnorchis* Miller unquestionably holds the field since in 1754 Miller restored the name given it by Boerhaave, the great Leyden botanist, in 1720. Fortunately there are few species in the genus so, if *Capnorchis* is, as it ought to be, adopted, little inconvenience will arise. As escapes from cultivation *Capnorchis formosa* (Walp.) Planch. and *Cucullaria canadensis* have been recorded in our *Reports*.

108. FUMARIA MURALIS Sonder. The true plant has been found by Miss TODD near Caerhayes, Cornwall, where Mr Pugsley has seen it in situ. It is satisfactory to have the true plant now authenticated as British. The old records of *muralis* are untrustworthy, forms of *F. Boraei* and other species being mistaken for the plant of Sonder.

143. CARDAMINE AMARA L., forma PARVIFLORA W. & G. To this Dr Thellung refers a plant which grows in the meadows near Loddon Bridge in Berkshire. The flowers are quite small. In was found there by Mr J. W. HIGGENS in 1917. It was thought by some botanists to be a hybrid.

181. SISYMBRIUM STRICTISSIMUM L., which has appeared as an

alien on the Mersey banks in Lancashire and Cheshire (*Rep. B.E.C.* 538, 1897), and in the Magdalen College Gardens at Oxford (*Rep. B.E.C.* 638, 1919), is strongly recommended by J. van Laren, of Amsterdam, as a fine border plant. Our member, the Rev. Prebendary H. E. Fox, has recently distributed it through the Club (*Rep. B.E.C.* 551, 1921).

216. BRASSICA ARVENSIS Kuntze, forma OCHROLEUCA. On the Churn-downs, Berkshire, growing with typical Charlock, were a few plants with whitish-yellow flowers, but the leaves showed no signs of albinism. G. C. DRUCE.

232. BURSA PASTORIS Weber. Three new British species. Dr E. Almquist has named a *Capsella* which under Mott's Arrangement would come under *densiflora* as being close to his C. ORIGO. It grew on the site of an aerodrome at Oxford. BURSA INCLINATA (E. At.). Growing on waste ground at Port Meadow, Oxford. BURSA MEDITERRANEA (*Rep. B.E.C.* 196, 1920), but without a British locality. I am now able to supply one from Carmarthen, June 1920. This year I also gathered it at Avignon and Bologna.

239. LEPIDIUM PERFOLIATUM L., Apropos du. G. Nicolas in Bull. Soc. Bot. France 401, 1921.

247 (13). L. HYSSOPIFOLIUM Desv., var. INTEGERRIMUM Thell. Alien, Bradford, Yorks, 1919, J. CRYER.

247 (31). L. DESVAUXII Thell., var. GRACILESCENS Thell. Alien, Bradford, Yorks, 1921, J. CRYER. An Australian species which appears in Britain under this modification.

358. LYCHNIS FLOS-CUCULI L., forma NANA. Isle of Stroma, Caithness, W. MANSON, ex A. TEMPLEMAN. A singular plant (forma *nana* mihi), dwarfed to two inches high with a single flower and green calyx-ribs. Experimental culture needed to see if the characters are permanent or if it is merely a state due to wind exposure. Mr Manson says it grows " in the thin layer of soil and harsh grass that manages to exist and is green in summer on that wind and spray-swept surface."

Var. OVALIS (Moris) Thell. (*M. ovata* Carmign.). Differs from the type by the more oval legume. Leith, 1921, J. FRASER.

Var. SORRENTINI (Tineo). (*M. inermis* Guss., sub-sp.). Leith, 1921, J. FRASER. These three varieties, which have been determined by Dr Thellung, are owing to the assiduity of Mr Fraser. They are probably introduced with esparto grass. The var. *ovalis* occurs in the Mediterranean areas, the var. *Sorrentini* is of Sicilian origin and differs in the non-development of spines on the legume. It is a handsome and variable species. The first two varieties occurred as adventives at Port Juvenal. See Thellung *Fl. Adv. de Montpellier* 310.

582. M. LACINIATA Willd., var. INTEGRIFOLIA Godron. Bradford, Yorks, 1921. I gathered this plant last September in company with Mr J. CRYER. The species is a native of the Canaries and Northern Africa, but is adventive in France, etc. This variety was first described by Godron on p. 18 of the Flor. Juvenal, and also in the second edition of that work in 1854. It is the *M. diffusa* of Poiret published in Lamarck Encycl. Suppl. 524, 1813, and in Fiori and Paoletti Fl. Anal. Ital. ii., 39, 1900, therefore we should write *M. laciniata*, var. *diffusa*. Dr Thellung identified it.

636. TRIFOLIUM PROCUMBENS L., forma FOLIACEA. In this the calyces become leaf-like. Holy Island, Northumberland, 1884, Rev. H. E. FOX; Sonning Cutting, Berks. See *Fl. Berks* 143, 1897.

637. T. DUBIUM Sibth., lusus vel var. UNGUICULATUM mihi. Found by Mr J. C. COOPER on waste ground at Yiewsley, Middlesex. This is a similar condition to that which often occurs in *Melilotus officinalis*, *M. alba*, and *Medicago lupulina*. The fruits elongate into a long horn-like process, the flowers are small or abortive and the long calyx segments give the inflorescence a curious appearance. Nothing certain is stated in the British floras as to the cause of this growth. It may be due to a mite, or it may be caused by the oversaturation of the soil with nitrogenous matter. The so-called var. *phyllanthum* Seringe of *Trifolium repens* has been attributed to damp seasons. Miss I. M. ROPER has sent me a similar plant from Portishead Dock, N. Somerset, 1922. G. C. DRUCE.

643 (6). DORYCNIUM SUFFRUTRICOSUM Vill. Hist. Pl. Dauph. iii., 416. *Lotus Dorycnium* L. Sp. Pl. 778, non Crantz. Alien, south and central Europe. ? Hortal. A small flowering piece sent me by Mrs MARGARET SHARPE from cliffs at Minster-on-Sea in the Isle of Sheppey, where it grew as two striking bushes about two feet high. It may be known from *D. herbaceum* by the narrower and more hairy leaves, the more shrubby habit, and by the keel of the flower being touched with a bluish-black. G. C. DRUCE.

Gen. 145 (3). PSORALEA L.

650 (11). P. BITUMINOSA L. Alien, Eur. mer. Radyr, Cardiff, 1921, R. L. SMITH.

657 (2). ASTRAGALUS STELLA Gouan Illust. ii., 50. See *Rep. B.E.C.* ii., 348. One of the espartal plants first noted in Britain from Leith has been found at Cardiff. It has bluish-purple flowers and smooth, spreading trigonous legumes.

675 (2). HEDYSARUM CAPITATUM Desf. Fl. Atl. ii., 177. Alien, Region Medit. Cardiff, Glamorgan, in Nat. Mus. Wales.

RUBUS. In *The Field* (November 15, 1921) Mr W. CRISP records the discovery in Essex of a Blackberry bush which yielded him 10 pounds of fruit. The berries are " red like a Raspberry; they make an excellent jam, the flavour being that of a Loganberry." In answer to my query Mrs Crisp, for unfortunately Mr Crisp has since died, tells me that he found it " on Fordham Heath, near Colchester, in October and November, and after the ordinary fruit had perished. The jam was rather too sharp, and not quite juicy enough to please everybody." Could it be a form of *plicatus* or its allies?

909. ALCHEMILLA GLOMERULANS Buser. Glen Eunach, Inverness-shire, 1917, Rev. J. ROFFEY; Ben Lawers, M. Perth, 1913, Rev. E. S. MARSHALL [Ref. No. 3885]. See A. J. Wilmott in *Bab. Man.* 579, 1922, and *Journ. Bot.* 163, 1922. Differs chiefly from *alpestris* by the stems and petioles being sub-appressed pilose throughout . . . flowers in dense clusters.

910. A. PASTORALIS Buser. *A. vulgaris* L., em. Buser. Lang-

don Beck Inn, Upper Teesdale, Durham, 1903, A. O. HUME. See A. J. Wilmott in *Bab. Man.* 579, 1922, and *Journ. Bot.* 165, 1922.

1028. DROSERA LONGIFOLIA × ROTUNDIFOLIA mihi. This is D. BELEZIANA Camus (see Rouy & Fouc. *Fl. Fr.* iv., 295). Several French stations for this rare hybrid, which I described in *Rep. B.E.C.* 30, 1911, as British, are given in *Le Monde des Plantes* 5, 1922, by M. Georges Rouy.

Gen. 206 (3). COLOCYNTHIS (Tourn.) L. (*Citrullus* Forskal Fl. Ægypt.-Arab. 167, 1775.).

1075 (11). C. CITRULLUS (L.) O. Kuntze. *C. vulgaris* Schrad. Alien, tropical Africa. On waste ground, Winchester, 1921, Miss TODD. Det. A. Thellung. This is the 'Citron' of the U.S.A. The fruit, which is 6-8 inches long and 3-4 inches broad, has a smooth, green stem and white, solid flesh. It is the M'tsama Melon of the Kalahari Desert, the chief water-supply of travellers in that region.

1114. PIMPINELLA SAXIFRAGA L., Nogle Studier over. H. E. PETERSEN in *Bot. Tiddsk.* 223-240, t. 4, 1921. Gives three types—(1) *latifolia*—incisions not penetrating half way to the mid-rib (this must be near our var. *poteriifolia* Wallr.); (2) *intermedia*—incisions penetrating more than half way (we put this to *P. Saxifraga*, type); and (3) *dissecta*—which equals the var. *dissecta* With.

1178. SAMBUCUS NIGRA L., var. VIRIDIS Aiton Hort. Kew. i., 374, 1789, based on Caspar Bauhin's 'Sambucus fructu in Umbella viridi.' Green-berried Elder, included in the *Pinax*, p. 456. Mrs WEDGWOOD found it near Marlborough this year. It is probably this form which is mentioned in the U.S.A. Department of Agriculture, n. 61, p. 54, 1922, as a variety "from Wiesbaden which has greenish-golden, transparent berries three or four times the size of the Common Elder. They are used in cooking and are found excellent and quite distinct in taste." Our green-berried Elder, which has also been found at Fyfield (see *Fl. Berks* 255), has berries somewhat larger than the type. The flowers are used, as is well known, to give the muscatel flavour to wine.

1249 (5). ASTER MACROPHYLLUS L. Alien, N. America. Hortal. Lochside Station, near Lochwinnoch, Renfrewshire, August 1922, R. GRIERSON. Det. at Kew. A tall species with lower leaves cordate and white or pale blue ray-florets. Well established.

1262 (7). ERIGERON SPECIOSUS (Lindl.) DC. Alien, N. America. Hortal. Waste places, Bexhill, E. Sussex, 1921, H. L. GREEN. Det. A. Thellung. A handsome garden perennial which Lindley in *Bot. Reg.* 1577 figured as *Stenactis speciosa*.

1264. E. KARWINSKIANUS DC., var. MUCRONATUS (DC.) Ascherson. In *Le Monde des Plantes* 7, 1922, Dr Thellung, under the above name, refers to the species which in the *British Plant List* I put under *E. mucronatus* DC. It is the common, naturalised species of South Europe, also occurring in Guernsey and the Isle of Wight. On the Continent it is frequently called *Vittadinia lobata*, but it is distinct from the true *Vittadinia triloba* Gaudich., an Australian plant which Bentham (*Fl. Austral.* iii., 491, 1866) puts as a form of *V. australis* Rich. Dr Thellung gives the distinguishing characters of *Vittadinia triloba* and *Erigeron Karwinskianus*, the latter of which is a native of Mexico, Guatemala, and Venezeula. He also gives a complete synonymy, and its habitats in Portugal, France, Britain, Italy, Switzerland (Tessin), Egypt, Algiers, and the Ile Maurice.

1324. ANACYCLUS RADIATUS Loisel., var. OCHROLEUCUS Ball Spic. Fl. Maroc 504, 1878. Alien, Afr. bor. Glasgow, 1921, R. GRIERSON. Det. A. Thellung. Lowe originally found this variety near Mogador. It is somewhat intermediate between the type and *A. clavatus*.

1325 (2). A. OFFICINARUM Hayne Arzneikunde ix., t. 46. Alien, S. Europe. Glasgow, 1922, R. GRIERSON, teste Kew.

1355. CHRYSANTHEMUM PARTHENIUM Bernh., var. FLOSCULOSUS DC. Prod. vi., 58. Differs from the type by having no ligules. The Feverfew has been classed by Linnaeus as a *Matricaria*, by Smith as a *Pyrethrum*, by Schultz as a *Tanacetum*, and by Grenier & Godron as a *Leucanthemum*. There is another slight variation in which

the ligules are quite small, forma *breviradiatum* (Schultz) = subvar. *breviradiatum* Rouy & Fouc. (*Fl. Fr.* viii., 263). There are also the well-known garden forma *flore pleno*, forma *variegata*, and forma *aurea* mihi. Mr G. C. BROWN sends the var. *flosculosus* from West Bergholt, N. Essex, and in my herbarium it is represented from Balsall Common, Warwick; Godstow Nunnery, Oxon. I have the forma *breviradiatum* from Greenhithe, Kent; Claverdon, Warwick; and Beaconsfield, Bucks.

1396. SENECIO SQUALIDUS L., forma nova GRANDIFLORUS. This grew at Botley, Oxford, on waste ground with many plants which had normal sized flowers. With them grew three or four patches of this large-flowered mutant. Neither soil nor exposure were factors in producing them for they grew mixed with, and on the same soil as, the type, and no intermediates were noticed. The ligules were from 25 to 30 per cent. larger than those of the type. G. C. DRUCE.

1396. S. SQUALIDUS L. *Senecio squalidus* seems to be a very variable plant. In Sicily I saw it in four distinct varieties.

(1) *S. Aetnensis* Tan. Leaves spathulate, slightly toothed or nearly entire; achenes glabrous. Grows in elevated regions of Mount Etna.

(2) *S. squalidus*, var. *glaucescens* Spr. Leaves irregularly and coarsely toothed; achenes glabrous or pubescent. Grows in an intermediate belt between the stations of *Aetnensis* and *typicus*; it occurs frequently mixed with both forms.

(3) *S. squalidus typicus*. Leaves irregularly pinnatifid with lobulated or coarsely toothed lobes; achenes silky. Grows on the lower slopes of Mount Etna.

(4) *S. squalidus chrysanthemifolius* Poir. (*Siculus* All.). Leaves 2-pinnatifid with narrow, nearly linear lobes and lobules; achenes silky. Grows on low land in Sicily.

The variety *glaucescens* is a connecting link or a hybrid between *Aetnensis* and *typicus*, two well distinguished plants. There occur frequently all intermediate forms between *glaucescens* and the two other species or varieties. The var. *chrysanthemifolius* seems to be only an extreme state of *typicus*. Dr W. A. FOCKE.

1405. S. PALUSTRIS Hook. This was included in the List of Extinct Plants which appeared in *Rep. B.E.C.* 733, 1919. It has been re-discovered, in August of last year, in central Norfolk by Sir H. Beevor. A most interesting record. See W. G. Clarke in *Trans. Norf. Nat. Hist. Soc.* 3, 1922.

1412 (3). BERKHEYA CERNUA (L. f.) R. Br. (*Didelta cernuum* Less.) Alien, Afr. austr. Lanal. Bradford, York, August 1920, J. CRYER.

1446. SERRATULA TINCTORIA L., var. CAMPANULATA Rouy Fl. Fr. ix., 106. Plante de 4-5 déc., robuste, ± rameuse ou bifurquée vers le haut; feuilles ovales ou lancéolées, entières; calathides mediocres, brièvement pédonculées, peu nombreuses, en corymbe un peu lâche; pericline campanulé, large à la base et non attenué, à folioles assez grandes, imbriquées sur 4-5 rangs. Under this, provisionally, I put a curious plant gathered by Messrs THURSTON and TRESIDDER at St Martin in Vicinage, Cornwall, in 1922. The basal leaves are 8 in. long by 2½ in. broad, entire, but with the margin irregularly toothed with small teeth; the flowering stem leaves 2½-3 in. long by ¾-1 in. broad, lanceolate, and cut at the base into small lobes ¼ in. long; heads stalked, few, in a very loose panicle, bell-shaped, with a broad base; phyllaries broad, narrowing upwards, in five rows, the margins covered with short, white, shaggy pubescence. The achenes are not ripe but seem to be small. It may be worthy of a distinct name as it has long, not short, peduncles and has other variations. I have found entire-leaved forms near Brickhill, Bucks, and in Warwickshire, but these are a different form. Again, from the north coast of Jersey, I have very robust-headed forms, but the heads are not truly sessile as in var. *alpina* Gren. & Godr., which Rouy, *l.c.*, makes synonymous with his ' forme *S. macrocephala*,' under which he puts, as a var., *monticola* (Bor.). He also has a var. of the forme *macrocephala*, var. *subintegra*, which in many ways applies to the Cornish plant under review, but the pericline, as a whole, is not pubescent, the calathides are not twice as large as in *tinctoria*, and the achenes are not larger.

1497. CREPIS CAPILLARIS (L.) Wallr., nov. var. GLANDULOSA. *C. nicaeensis* of the Orkney Flora, not of Balbis. In 1921 Colonel

Halcro Johnston accompanied Mrs Wedgwood and myself to the waterworks reservoir near Kirkwall to show us *nicaeensis*. I was sceptical of the large flowered *Crepis* which grew there being *nicaeensis*, and indeed on my return to Stromness threw the greater part of my gathering away. On returning home my scepticism increased and for confirmation I sent a plant to Dr Thellung, who replied—" Certe non *Crepis nicaeensis* ob receptaculum mamillatum glabrum. In *C. nicaeensis* receptaculum profunde favosum fovearum marginibus elevatis fimbriato-ciliatis "—a distinguishing character which is not given in our British floras. The plant of Kirkwall is a not uncommon form in Scotland. It is characterised by the more glandular and darker coloured phyllaries, the somewhat short peduncles, and its robust growth. I have seen it from Elphin, Sutherland, and Inverbroom, W. Ross; also from near Newquay (*Vigurs*), and Ponsanooth, Cornwall (*Davey*). Some plants named *agrestis* W. & K. by British botanists also come under this. The true plant of Waldstein & Kitaibel was discussed in the *Report* 574, 1916, where the description says nothing of black, glandular hairs, and the flowers are not large—in fact, it is very close to, and may possibly precede, *runcinatus* Bisch. Koch (*Syn.* 440, 1837) added " capitula duplo majora." Rouy, Foucaud & Camus (*Fl. Fr.* ix., 229) describe a sub-species, *C. agrestis* W. & K., " calathides nettement plus grandes; folioles de péricline pédoncules (et parfois même rameaux) hérissés de longs poils noirs, étalés, entremêlés de quelques poils glanduleux; stigmates bruns," which seems to fit these plants, but I have not been able to consult the type. Obviously they do not agree with Waldstein & Kitaibel's description. Hence it seems desirable to give our plant a definite, varietal name. G. C. DRUCE.

1502. C. TARAXACIFOLIA Thuill., nov. var. SUBINDIVISA mihi. This differs from the type by the leaves being entire, with about twelve short teeth on each side of the entire, almost spathulate lamina. This variety I found on waste ground at Ware, Herts, last May, with Miss TROWER. Mr THURSTON sent a similar plant from Biscovey, Cornwall, and I have it from Ventnor, Isle of Wight. G. C. DRUCE.

1645. TARAXACUM SIMILE Raunkier in Dansk Excurs. Fl. 2 udg. 1906. Sweden, Norway, and Denmark. North Berwick, Haddington, 1904, G. C. DRUCE.

1645. T. PROXIMUM Dahlst. in Bot. Not. 1905 et Exsicc. fasc. i., n. 11, 1911. Sweden, Norway, Denmark, and Finland. A plant, nearest to this, was gathered by me on the Salisbury Crags, Midlothian, in July 1878, G. C. DRUCE.

1645. T. ARRHENII Palmgren in Act. Faun. et Fl. Fennica xxxiv., i., 25, 1910. Isle of Aland. Oxford, 1916; Hailey, Oxon [Y. 92], 1921; Oxford Parks [Y. 105], distributed through the Club (see *Rep. B.E.C.* 569, 1921), Oxford [Y. 96]; Stow (not Stour) Wood, Oxon [Y. 50], *l.c.* as a related form, and also as a form from Princes Risborough, Bucks [Y. 44], G. C. DRUCE.

1645. T. NAEVOSIFORME Dahlst. in Arkiv. for Botanik, band 12, n. 2, 49, 1912. Norway. Allied to *naevosum*. Twl Dhu, Carnarvon, at 2000 ft., 1900; Teesdale, Durham [No. 9799]; Kirkwall, Orkney, 1920; Bressay, Shetland, 1921, G. C. DRUCE.

1645. T. DUPLIDENS Lindb. fil. in Act. Faun. et Fl. Fennica 29, 1907. Norway, Sweden, Scania, Russia, and Denmark. Near Stow Wood, May 1912, G. C. DRUCE; Odiham, N. Hants, C. E. PALMER, in *Hb. Druce*; Ham Common, Surrey [N. 807], W. A. TODD.

1645. T. DECIPIENS Raunkier Dansk Excurs. Fl. 2 udg. 1906. Sweden, Norway, and Denmark. A form of this on Banstead Downs, 1922, W. A. TODD.

1652. LACTUCA MACROPHYLLA A. Gray. *Mulgedium macrophyllum* DC. *Cicerbita macrophylla* (Willd.) Wallr. Alien, Caucasus. Hortal. In a field in the parish of Meole where it has been known for thirty years. It also grows near Shrewsbury. The specimen was kindly sent by Miss AGATHA WILKINSON in July 1921. It is a handsome, garden species, four feet high, with large heads of pinkish-purple flowers. The large, cordate, radical leaves distinguish it from *alpina*. Can it be the *alpina* of *Rep. B.E.C.* 272, 1915, from Salop, of which only a scrap was sent me? *L. macro-*

phylla has also been sent me from Patterdale, Cumberland, by the Rev. W. WRIGHT MASON.

1669. PHYTEUMA SPICATUM L., sub-var. CAERULEUM Rouy & Fouc. Fl. Fr. x., 85 = var. CAERULEUM Gren. & Godr. Probably introduced. Further research is needed. A solitary specimen was found by Mrs STOKES in a rough bank at Bridhdir, Merioneth, 1922, below the Lodge of Mrs Richards, "which is cut for hay. The Lodge has no garden except a bed of geraniums, so it could not have been a stray seed from any garden as there is no other house near. The bank has been rough pasture for the last 40 years. The adjoining farm is only a hill-farm with primitive cultivation." Mrs Richards, *in litt.* The discovery is an interesting one, but the place should be examined carefully to see if it occurs again and in greater quantity. The plant differs from the Sussex *spicatum*.

1680. (2). LEGOUSIA FALCATA (R. & S.), comb. nov. *Specularia falcata* A. DC. Mon. Camp. 345. Alien, Reg. Medit., Persia, Asia Minor. Old Camp, Basingstoke, Hants, 1916, J. F. RAYNER.

1699. ERICA VAGANS L., var. KEVERNENSIS Turrill in Kew Bull. 175, 1922. There diagnosed as "a planta typica corollis late campanulatis roseis haud purpureis, lobis plus minusve reflexis praecipue differt." It was found on the same day by Mr P. D. WILLIAMS very near to the spot where he discovered that interesting hybrid of *E. vagans* with *Tetralix* which (*Rep. B.E.C.* 24, 1911) I named × *E. Williamsii*. Only one plant of *kevernensis* was found but, fortunately, cuttings were taken as the original plant was afterwards destroyed by cattle. Plants from Mr Williams were sent to Kew, where they now occupy an entire bed near beds of typical *vagans* and *Williamsii*. Dr Hill and others have noticed reversions of *kevernensis* to the type. At present it is not ascertained whether we have in this plant a true variety or a mutation which may not be perpetuated by seed. The plant is more ornamental than *vagans*. I saw beautiful specimens in flower at Westonbirt last October which showed no traces of hybridity.

1710. PYROLA SECUNDA × MINOR. This year Mr STANLEY RED-

GROVE sent me a specimen which was gathered by E. G. BEACH in the Findhorn Gorge, Elgin, where both the assumed parents grow, of a *Pyrola* which has the smaller and more toothed leaves of *secunda* but with the larger and whiter flowers of *minor*. If the assumed origin is correct it is an extremely interesting hybrid, hitherto unrecorded.

1725. PRIMULA VULGARIS L., Teratology of. G. Beauverd in *Bull. Soc. Bot. Genev.* 8, 1921. Pollination of the British species, Miller Christy in *Journ. Linn. Soc.* 105, 1922.

1757. CENTAURIUM PULCHELLUM Druce, var. PALUSTRE (Gaudin) nov. comb. Gathered by Lady DAVY and Miss BACON on Hayling Island, S. Hants, September 1921. Gaudin (*Fl. Helv.* ii., 137) describes his variety as "caule simplici filiformi unifloro vel superne sub-dichotomo paucifloro." This is close to, if not identical with, forma *simplicissimum* (Schmidt) Zimm. (see *Rep. B.E.C.* 569, 1919) and var. *Swartziana* Wittr. in Bot. Centralb. xix., 62, but Gaudin's trivial appears to be the earliest. The Hayling Island plants are tetramerous, having the calyx tube segments and corolla lobes in fours. I have similar plants from Guernsey, Isle of Wight and Kent.

1760. GENTIANA PNEUMONANTHE L. The specific name is said to have been first used by Cordus in 1541. The true Shamrock and how to identify it, *l.c.*, 139, 1921. J. BRITTEN in *Garden* 19, 1921.

1776 (6). NEMOPHILA MENZIESII Hook. & Arn. Beechey Voy. 152. Alien, North America. Hortal. Glasgow, 1921, R. GRIERSON. Det. A. Thellung, who suggests its being compared with the subspecies *liniflora* (Fisch. & Mey.) Brand. This is a pretty garden plant introduced in 1836. It has many cultivated varieties.

Gen. 432. IPOMOEA L.

1832 (5). I. PURPUREA (L.) Lam. *Pharbitis purpurea* Voigt. *P. hispida* Choisy. Alien, tropical America. Hortal. Eastville, Bristol, 1921, NOEL & Mrs SANDWITH. Det. A. Thellung. This is the well-known *Convolvulus major* of seed catalogues, and here, of course, of only garden origin. When it was found the unopened.

whitish corolla was not easily recognised. It is figured as *Convolvulus purpureus* in Bot. Mag. t. 318, and was introduced into cultivation in Britain as early as 1629.

1833. CONVOLVULUS ARVENSIS L., forma PURPURASCENS Lindm. Svensk. Fl. 457. Fallow fields on downs above Abinger, Surrey [Ref. No. 2511], June 1922. Stems prostrate, not twining, flowers purplish-red coloured. C. E. BRITTON.

1835 (2). C. SICULUS L. Alien, Mediterranean. Slateford, Midlothian, September 1906, J. FRASER.

1836 (4). SOLANUM AVICULARE Forst. f. Prod. 18. Alien, New Zealand, Australia. Tresco, Scilly, 1920, A. J. HOSKING in *Supp. Fl. Cornw.* 95, 1922.

1846 (3). S. NITIDIBACCATUM Bitter in Fedde Rep. Sp. Nov. xi., 208, 1912. Alien, Chile, Argentina, Bolivia. Sent me from N. Wales by A. DALLMAN. Dr Thellung says the specimen is too young for positive identification.

1850 (3). S. MARITIMUM Meyen, ex Nees in Nov. Act. Nat. Cur. xix., Suppl., 384, 1843. Alien, Chile. Chicken-run, Swaythling, S. Hants, June 1921, J. F. RAYNER. Det. at Kew. A pretty plant with finely and acutely-cut leaves.

1859 (6). NICOTIANA ? × SANDERAE Hort. Sander = N. AFFINIS × FORGATIANA. Alien. Hortal. Battle Abbey, Sussex, 1921, H. L. GREEN.

1873. LINARIA VULGARIS Miller, forma nova vel lusus VAN DE WEYERI. This plant has a striking appearance owing to its pale, regular, yellow flowers, scarcely a trace of a darker yellow being seen in the throat. The leaves are narrow; the plant quite eglandular; the corolla cut nearly to its middle into four nearly equal, oblong, bluntly apexed lobes; the lip completely obsolete; the spur absent from most of the flowers. On my specimen, which has about thirty blossoms, only one has a spur. This season it did not set seed. It was discovered by Major Bates van de Weyer, after whom

it is named, on a railway embankment in the parish of Avington, Berkshire. G. C. DRUCE.

1874 (2). L. HETEROPHYLLA Desf. Fl. Atl. ii., 48, 140. *L. stricta* Guss. Fl. Rar. Sicil. 250, 1826. Alien, Sicily, N. Africa. Carinal. On ballast at Radyr, Glamorgan, 1921, R. L. SMITH. A pretty species with narrow upper leaves and bright yellow flowers having an orange palate. I once found it near Messina.

1894. SCROPHULARIA NODOSA L. Formae novae. Fedde Repert, 455, 1921.

1896 (2). S. HOPPII Koch. Alien, Europe. Radyr, Glamorgan, R. L. SMITH. Det. W. B. Turrill.

1903 (3). DIGITALIS LUTEA L. Alien, Europe. Hortal. Looe dust heap, Cornwall, E. THURSTON in *Supp. Fl. Cornw.* 100, 1922.

1923. VERONICA PERSICA Pers., Floral Variation in. T. A. SPRAGUE in *Journ. Bot.* 351, 1922.

1930 (5). V. SALICIFOLIA Forst. f. Prod. 3. Alien, New Zealand. Hortal. On river-bridge, Lostwithiel, Cornwall, C. C. VIGURS in *Suppl. Fl. Cornw.* 101, 1922.

1934 (2). EUPHRASIA CONFUSA Pugsley, forma ALBIDA in Journ. Bot. 1, 1922. Differs from the yellow-flowered type by its white flowers and sometimes more robust habit. Mr Pugsley gathered it with the type at Simonsbath. It also occurs at Farthing Downs, Surrey; St Cleer Downs, etc., E. Cornwall; and Mr Pearsall's "*E. Kerneri*, simulating *minima*," from Derwentwater, is thought to be the same form. Mr Pugsley doubts the occurrence, on present evidence, of Host's *E. stricta* in Britain.

1986 (3). VERBENA BONARIENSIS L. Alien, America austr. Bradford, Yorks, 1920, J. CRYER. Probably this.

1986 (4). V. BRACTEATA Cav. Alien, Amer. bor., etc. Bodmin Road Station, HARVEY in *Suppl. Fl. Cornw.* 106, 1922.

1999. MENTHA RUBRA × M. CITRATA Ehrh. = (M. SPICATA × AQUATICA) × (AQUATICA × ARVENSIS × SPICATA). Between Stanstead Church and Roydon Station, Herts, 1843, W. H. COLEMAN. To this combination Mr J. Fraser suggests referring a Mint in my herbarium. As he points out, " it has the glabrous character of the two putative parents. The rounded form of the upper leaves suggests *rubra*. The verticils are two more in number than in *aquatica*, and the inflorescence as a whole compels one to look for a verticillate Mint, such as *M. rubra*, as one of the parents." I have gathered *M. citrata*, to which Coleman referred this plant, close to Roydon. Further investigation is needed, and one hopes Miss Trower may be fortunate enough to re-find the same interesting Mint.

2011. SATUREIA CALAMINTHA Scheele, var. VILLOSA (Boiss.), comb. nov. *Melissa Calamintha* L., var. *villosa* Boissier Voy. Bot. d'Esp. ii., 497, 1839-45, defined ' Tota pilis albis patulis obsita.' *Calamintha officinalis*, var. *villosissima* Boiss. (cit. fals.) Willkomm & Lange Prod. Fl. Hisp. ii. *C. menthaefolia*, var. *pauciflora* Lange Pugil. 176. *Calamintha boetica* Boiss. & Reut. Pug. 92, 1852. Spain, Portugal, Algeria. The following is the description in the *Prod. Fl. Hisp.* Canescens, caule adscendente 1-1½ l., ramosissima ramisque patule et dense albo villosis; foliis mediocribus v. parvis; breviter petiolatis, ovato v. triangularia-deltoideis, basi truncatis, obtusissimis et obtusissime crenulatis, molliter et adpresse villosis, subtus elevato-nervosis, cymis paucifloris, breviter pedunculatis v. subsesillibus, pedicellis hirtis pedunculo longioribus; calycis fructiferi nutantis tubo turbinato, corollae roseae patule hirtae tubo calyce duplo longiore, a basi sursum valde ampliato. Trabut & Battandier (*Fl. Alger.* 680) say " Plante très velue, à tiges ascendantes, rameuses; petits feuilles très brièvement pétiolées, tronquées à la base, crénelées, velues, fortement nerviées; fleurs grande, comme dans *C. officinalis* en cymes pauciflores, brièvement pédonculées; calice assez semblable à celui du *C. Nepeta*, moins élargé à la base, nutant à la floraison." Discovered by Mr H. W. PUGSLEY near Swanage, Dorset, in 1922. See *Proc. Linn. Soc.* December 1922. The grade of this plant is somewhat doubtful. On a *Taraxacum* standard it may well deserve the specific rank which Boissier

& Reuter accorded it. Boissier had, however, first established it as a variety, and it is a pity that in raising it to a species the early trivial was not retained. Lange also at first gave it varietal rank, while Nyman (*Consp. Fl. Eur.* 588) makes is a sub-species. In the *Index Kewensis* it is referred to *C. officinalis*. Unfortunately in our *List* the sub-sp. grade is not adopted, and it is also rejected in the *Cambridge Flora*, so that one has to choose between the specific or varietal grade. As I have not seen the British plant growing I fall back upon Boissier's earlier view. *S. Calamintha* is a polymorphic species. Further study may show that the higher grade is deserved. In such a case I suppose it should be called *Satureia boetica* (B. & R.) comb. nov., rather than *C. villosa* unless the earliest trivial (in any grade) is to be used. It may be added that Boissier distributed it from Spain (No. 1986) as *C. officinalis* in his *Exsicc. Hisp.-Lusit.* It is an extremely interesting addition to the British flora.

2056. STACHYS SYLVATICA L., Observations on Variations in the Flowers of. E. M. CUTTING in *Ann. of Bot.* 405-425, 1921.

2092. PLANTAGO LANCEOLATA L. Mr B. Millard Griffiths in *Journ. Bot.* 228, 1922, gave the results of cultivating some forms of *P. lanceolata*, including the so-called variety, *sphaerostachya*. "The resultant plants were all large and robust *lanceolata* of typical form, with long leaves, long peduncles, and cylindrcial inflorescences." The experiments, which were repeated at Newcastle, seem to indicate " that the varieties of *lanceolata* are largely dependent on habit, and that the variety *sphaerostachya* can be produced at will by putting the plant under unfavourable conditions of growth." This was a conclusion arrived at by Dillenius about 1720, for he says, of round-headed plants brought from Salsey and Llanberis, " in vulgarem transit." See *Rep. B.E.C.* 583, 1910, where I said that " an individual plant [from Jersey] kept true for one year in my garden, but the next year reverted to type." Mr Griffiths also experimented with the large and small forms of *P. major*, but one would like to see check cultures made before arriving at a definite opinion.

2092. P. LANCEOLATA L., Sur des Epis Teratologiques du. L. Plantefoi in *C. R. Acad. Sc. Paris* 1108-1111, 1921.

2099. P. MAJOR L., Uber Salzformen von. = P. WINTERI Wirtg. Verh. Bot. Prov. Brandbg. 102, 1922.

2100 (3). P. ARISTATA Michx. Fl. Bor. Amer. i., 95, 1803. *P. patagonica* Jacq., var. *aristata* A. Gray Man., ed. 2, 269, 1856. See *Rep. B.E.C.* vi., 42, 1920, and 302, 1921. Dr Thellung thus refers Mr Biddiscombe's plant from Woking. Mrs Sandwith saw it also in 1922 at the Bristol Docks. *P. aristata* is a common North American species.

Gen. 505 (2). ALTERNANTHERA Forsk. Fl. Ægypt.-Arab. 28, 1775.

2116 (30). A. NODIFLORA Br. Prod. i., 417. Alien, tropics. Lanal. Bradford, Yorks, 1921, J. CRYER. An attractive species, with glossy, scarious, white flowers clustered at the nodes.

2124. CHENOPODIUM ALBUM L., var. PSEUDO-BORBASII (Murr as a sub-sp.), f. OPULIFORME (Murr) as a var. Maplestead, N. Essex, 1922, G. C. DRUCE.

2124. C. ALBUM × OPULIFOLIUM = sub-sp. PLATANOIDES J. B. Scholz. Near Hythe Quay, Colchester, September 1922, G. C. DRUCE.

2124. C. ALBUM L., var. SUBSTRIATUM Murr, f. MICROPHYLLUM Murr (as var. or forma of sub-sp. *pseudo-striatum*). Northampton, 1921, G. C. DRUCE. Near to *C. striatum* but with more farinose glomerules and more acute leaves.

2124. C. ALBUM L., var. (as sub-sp.) SERRATO-SINUATUM (Murr). Colchester [Ref. No. 2017], 1922, G. C. BROWN.

2124. C. SUBOPULIFOLIUM Murr. See *Rep. B.E.C.* vi., 304. 1921. *C. album* × *opulifolium*. Brislington, Bristol, 1921, Mrs SANDWITH.

2125. C. LEPTOPHYLLUM Britt. & Brown, var. OBLONGIFOLIUM S. Watson. Alien, N. America. Sent, as a form of *C. album*, from near Southampton, by Mr J. RAYNER, in 1921. Det. A. Thellung.

2127. C. GLAUCUM L., var. PROSTRATUM Beck Fl. Nied.-Oestr. 331, teste Murr. Hayle, Cornwall, 1915, F. RILSTONE.

2130 (4). C. BERLANDIERI × STRIATUM (near to × *C. pulchellum* Murr ined.), receding in some of its characters to *C. Berlandieri*. Aberdovey, Merioneth, Mrs DEBENHAM.

2131 (14). C. FOETIDUM Schrad. in Ges. Nat. Fr. Berl. Mag. ii., 79, 1921. Alien, tropics. Lanal. Waste ground, Bradford, J. CRYER. A pretty, much divided Goosefoot which Mr Cryer showed me in situ. Doubtless one of the wool or skin aliens.

2151 (3). ATRIPLEX CAMPANULATUM Benth. Fl. Austr. v., 177. Alien, Australia. Lanal. Galashiels, Selkirk, 1910, Miss HAYWARD and G. C. DRUCE; Bradford, York, 1921, CRYER & DRUCE. Dr Thellung suggests this identification from the description only. A similar plant has been found in Switzerland. See Thellung in *Viert. Nat. Ges. Zurich*, lxiv., 726, 1919.

2184. POLYGONUM AVICULARE L. = P. HETEROPHYLLUM Lindm., var. LITORALE (Link), forma GRANDIFLORA Druce in Rep. B.E.C. 519, 1921. A very robust plant with large leaves and large flowers from the coast at Uyea, Unst, Shetland.

2196. RUMEX AQUATICUS × DOMESTICUS = R. ARMORACIFOLIUS Neum. Montell in Medd. Soc. pro Faun. et Fl. Fennica 58, 1921.

2210 (13). R. OBOVATUS Danser. *R. paraguayensis* Parodi. Thell. in Rep. B.E.C. 258, 1920. Ware, Herts, 1914, DRUCE; Elland [Ref. No. B 73], Tingley [Ref. No. B 79], Yorks, 1918, E. C. HORRELL; Hull, Yorks, Miss COBBE; Glasgow, 1920, GRIERSON; Bristol, 1920, NOEL SANDWITH. *R. dentatus* L., from Glasgow, must be deleted.

2210 (14). R. CUNEIFOLIUS Campd. Mon. Rumex 66, 95. Alien, South America. Adventive in Holland and Germany. Leith Docks, 1921, J. FRASER; Phellack sand-dunes, Cornwall, near the site of a mule camp, THURSTON & RILSTONE. Det. A. Thellung. Mr Fraser has known it at Leith for nearly twenty years. Mr Thurston sent it me from Cornwall also in 1921. Probably in the latter place it owes its occurrence to mule-fodder from Argentina or the Falklands.

2216. HIPPOPHAE RHAMNOIDES L., The Names of. Arthur Bennett in *Naturalist* 157, 1922. Wyebibble is a name given in Wright's *Dialect Dictionary* and is used in Norfolk, and Morley (*Eng. Writers* i., 247) says there is the prefix in Wiveton or Wiverton, a village in Norfolk, and "Wive-ton the settlement of the people of Wiva."

2244 and 5. ULMUS MONTANA Stokes and U. CARPINIFOLIA Borck (NITENS). In *Journ. Bot.* 36, 1922, Mr MILLER CHRISTY has a paper on the flowering times of these species. The former dates from March 2, the latter from December 27 and January 4. Miss E. ARMITAGE (*l.c.*, p. 141) gives January 16 as a date of the flowering of the English Elm.

2245. U. MONTANA. Was ist unter den namen *U. montana*, var. *nitida* Fr. zu verstehen *Bot. Not.* 71, 1921.

2250. URTICA DIOICA L., The Ecology of. Carsten Olsen in *Journ. Ecol.* 1-18, 1921.

2252 (4). U. INCISA Poir. Alien, Australia and New Zealand. Ide, Devon, 1918, Miss TODD. Dr Thellung suggests this curious Nettle may be this species, and 'Kew' so names them. It has occurred in Switzerland as an adventive.

2252 (5). U. FLABELLATA H. B. K. Alien, South America. Lanal. Bradford, York, July 1905, J. CRYER. Det. A. Thellung, 1921.

2258. ALNUS GLUTINOSA Gaertn. Mr A. D. WEBSTER (*Gardeners' Chronicle* ii., 84, 1922) has an interesting article on the use of the wood of the Alder for making clogs. He states that clog-making is one of our oldest industries, and that in 1200 the English Archers petitioned the King to prohibit the use of Aspen for that purpose or there would be a shortage of wood for their bows and arrows.

2258 (2). A. INCANA Medik. Pfl. Anat. 393, 1792. *Betulus Alnus*, var. *incana* L. Sp. Pl. 983, 1753. Loudon Arb. fig. 1543. Alien, Europe, even arctic, Northern Asia, and North America.

Introduced into Britain in 1780 (Loudon). *A. incana* is a tree from 8-30 feet high (Loudon gives 50 to 70 feet), with a smooth, greyish bark; the broadly oval or ovate leaves are slightly pointed or even acuminate in the young shoots, sharply serrate or biserrate, slightly hairy above, and covered usually with a short greyish tomentum which gives a hoary appearance to the foliage; the nerves are in 10-15 pairs but lack the tuft of hairs at their base which is so often present in *glutinosa*; male catkins 2-4; female 3-6, brownish-grey, denser and larger than in *glutinosa*; fruit large, pentagonal, reddish-brown, not shining. It is said to affect drier situations than *glutinosa*. In Norway it is a conspicuous tree on the lower slopes of the mountains and by lake sides, but I observed no trees taller than 25 feet. Usually it forms a close scrub. In North America it grows in thickets along the stream sides, and there rarely exceeds 20 feet. In the Jura and Alps it rejoices in the proximity of mountain streams. It may be distinguished from *glutinosa* by the characters given above, *i.e.*, the young branches pubescent, not glabrous; by the more pointed, not rounded, leaves; by the pubescent-tomentose covering of their lower surface and by the tufts of hairs in the nerve-axils being absent. In 1921 Mr J. Little sent me a specimen from near Hitchin, Hertfordshire. In 1922 the Rev. W. Wright Mason brought me a specimen to name which he gathered in 1920 in Cumberland which consisted of leaf-branches of the same species. He gathered it in the parish of Melmerby, by the side of the Sunny Gill Beck, in a plantation of young larch and spruce. The tree from which the specimen was gathered is between thirty and forty feet high. A second tree, presumably of the same species, is about twenty-five feet high. Both are this year without catkins. The method of introduction, for at present we have no evidence which warrants us in claiming it as a native, is doubtful. We have been unable, so far, to obtain a clue as to whether they were an accidental or intentional introduction. The size of the Melmerby trees shows that they are not less than 30 years old. In the *Guide to the Cambridge Botanic Gardens* Mr Gilbert-Carter says it is "Naturalised in the district of Furness, where it has been planted as windscreens, and in other parts of Britain." From the geographical distribution it is a tree which we might have expected to occur in Britain. G. C. Druce.

2304. NEOTTIA NIDUS-AVIS Rich. M. C. RAYNER (*Gard. Chron.* 102, 1922) in two brilliant papers gives some fascinating information about the bionomics of the partnership of this orchid and its fungal friend. The orchis, which is often rootless, in no case produces sugar from the carbon dioxide of the air. It would seem that the fungus is the working partner, since it can draw upon the soil humus for both its carbonaceous and nitrogenous food materials. This subject was very fully dealt with in lectures before the Ashmolean Society by Dr Vines some years ago. In a remarkable Japanese species, *Gastrodia elata*, it has been proved that the orchid plant is parasitic upon the fungus during part of the life-cycle—a most unexpected thing since the fungus host is the Honey Agaric, *Armillaria mellea*. The *Gastrodia*, which consists of a rootless tuber, periodically throws up an immense inflorescence. Owing to the absence of roots and the corky covering of the tuber fresh supplies of food material can enter the plant only through the rhizo-morphæ of the fungus. . . . Eventually the whole of the invading hyphae are digested and the soluble products absorbed by the cells of the tuber. Only when this happens can the plant reproduce itself by seed. Therefore the term saprophytic, so generally applied to *Neottia* and other chlorophylless plants is incorrect. But fungi are present and necessarily present in many other plants—*Asparagus officinalis*, *Colchicum*, *Anemone nemorosa*, *Teucrium Scorodonia*, *Stachys officinalis*, *Ericas*, *Calluna*, and many others. Dr Rayner describes the method of infection of the Ling, which differs materially from the case of the *Neottia*, by the fungus which takes place while still within the fruit followed by inoculation of the seedling from the seed-coat at germination. *Calluna* is therefore like the Lichen—if indeed that theory be correct—a dual organism. Only for a brief space of time within the resting seed does the embryo retain its individuality as an independent plant. The suggestion made is that in the case of plants like Ling and Heather which often monopolise large areas of soil poor in available nitrogenous material that the fungus in this symbiotic partnership possesses in some degree the power of utilising atmospheric nitrogen as a source of food. *Neottia* and *Hypopitys*, which are found growing in barren, chalky soils, may also by means of their " co-operating fungus " benefit in a similar way.

2325. ORCHIS LATIFOLIA L. Mr R. F. TOWNDROW, of Malvern, sends this communication:—" I am much interested in the unravelling of the *Orchis latifolia* tangle which you are conducting. This summer I paid a visit to a small swamp where I used to gather Marsh Orchids and, as I expected, found *O. praetermissa*, fine *O. Fuchsii*, and what I used to call *O. latifolia*, and also plants which I used to think hybrids of *latifolia* and *maculata* (that is *Fuchsii*). I now feel that *latifolia* as a species must go, and that the plants I originally called by that name must be looked upon as *Fuchsii* × *praetermissa*. Those which I then called hybrids of *latifolia* and *maculata* (*Fuchsii*) must either be second crosses or contain an extra dose of *Fuchsii* in their composition. This, as far as I can gather, would be your own view, after a much larger experience. You have, I have no doubt, noticed how destructive to Meadow Orchids is the use of basic slag. I suppose it really destroys the fungi in the soil from which part of the nutriment is derived." It may also, by its basic character, change the acid character of the soil.

2325. O. LATIFOLIA L. What is *Orchis latifolia* L.? An attempt has recently been made by Mr A. J. Wilmott at a Linnean Society meeting to restrict the name *O. latifolia* L. in the sense of *praetermissa* on the somewhat unstable evidence of supposed specimens of *praetermissa* which were found recently in a locality which nearly 200 years ago yielded a plant which is grouped under *latifolia* by Linnaeus. Orchids are notoriously uncertain in their occurrence. The marsh which may afford numbers of *praetermissa* one year may show hardly a solitary specimen in the next. In a meadow which I know *incarnata* was abundant with a few *praetermissa* one year, another season gave plenty of *praetermissa* and only a few *incarnata*. It must be borne in mind that although Linneaus gave the Oeland locality for a plant which is placed under his *latifolia*, yet that was only one of many grouped under that name, and no such restriction is placed upon the habitat when he established his ' species.' He gives " in Europa pratis."

The description of *O. latifolia* (*Sp. Pl.* 1753)—and it is the description which is of primary importance—eliminates *O. praetermissa* since the only important segregating character, "labio trilobo lateribus reflexis," given by Linnaeus does not apply to *praeter-*

missa. Beneath the description Linnaeus adds many references, for they are references rather than synonyms, which refer to three or four different plants. These need not be given in detail. We must turn to his paper in the *Acta Upsala* p. 15, 1740. Linnaeus thought there were two species of the palmate Orchids. One he has quite clearly segregated in the *Species Plantarum* as *O. maculata* which has the " nectarii labellum trifidum, planum; lobis lateralibus majoribus crenatis; intermedio angustissimo, integerrimo," localised " In Europa pratis succulentis," which rather applies to *maculata* than *Fuchsii*. The other is *O. latifolia* which will be seen in the *Acta* to be a group (not a separate entity) consisting of at least four species of which he gives two pages of synonyms, etc. The details of these would only weary the reader, but under it he had brought every name which he thought did not apply to *maculata*. That he cites the *Acta* under *O. latifolia* in *Sp. Pl.* 61, 1753, shows conclusively that it is a compound species too indefinite to allow it to be used in a segregate sense even on the principle of residuals, much less on a habitat basis, since any precision which one reference may have is nullified by the general habitat given for *O. latifolia*. Again the description of the type of the *Acta* (if such it can be called) is " labio trilobo integerrimo " which excludes *praetermissa* and probably means *incarnata*. There is no allusion to the leaves, whether spotted or unspotted, or their tint of colour, or whether the stem is hollow or solid. There is nothing to show that it may not be *Helodes* or *incarnata*. Among the references is one to Morison, t. 15, f. 3, where Bobart has probably had figured the *Orchis praetermissa* from the Oxford meadows, although his text description is quite vague. The plant of the Hortus Cliffort. 429, also mentioned, may be this species, as may be the specimen in Herb. Cliffort. But it is only guess work to try and identify many of the synonyms cited. The most important synonym in the *Sp. Pl.* is that cited from the *Flora Suecica* because there he is speaking of a plant he has seen and not a book description he has read, or of which he has only seen a figure, or a dried specimen. This shall now be dealt with. First, however, it should be remarked that Linnaeus' treatment of the Orchid Family was greatly criticised by Haller and other acceptors of the Tournefortian genera. Nor was this to be wondered at. Linnaeus was evidently at his

worst in his generic concepts of the Orchidaceae. For instance, his genus *Orchis* consists of such diverse constituents as *Satyrium*, *Disa*, *Habenaria*, *Zeuxine*, *Limodorum* and *Bartholina*. His genus *Satyrium* included species of *Orchis*, *Habenaria*, *Epipogon*, *Spiranthes*, *Goodyera* and *Eulephia*. His *Ophrys* consisted of *Neottia*, *Corallorrhiza*, *Spiranthes*, *Listera*, *Liparis*, *Malaxis*, *Microstylis*, *Herminium*, *Aceras*, *Pterygodium* and *Disperis* in addition to the true *Ophrys*—a jumble indeed. He muddled the two distinct Tournefortian genera *Helleborine* and *Serapias* under the latter name—an illicit connexion which was at once challenged by Hill. Then he united under the name, *Ophrys insectifera*, all the true Ophrydes making the bee and the fly, etc., only varieties. Therefore if he took such a wide view of the species of *Ophrys* need we wonder that he regarded the numerous forms, hybrids, species, and varieties of the Marsh Orchids as forms or varieties of one very variable species. However, the criticisms of Haller and other correspondents and his own observations showed him that his first views needed considerable modifications. He was sufficiently great to alter his opinions when necessary. We, therefore, find in the second edition of the *Flora Suecica* of 1755 that he separates from the heterogenous mass included under *latifolia* in the *Sp. Pl.* two species, *O. sambucina* and *O. incarnata*, and he now gives to his residual *latifolia* this segregating character " folia parum maculata . . . nectarii labium retrorsum complicatum serratum, obscure trilobum " which does not fit *praetermissa* and this is emphasised when we see that in contrasting *incarnata* with his *latifolia* he says of *incarnata* " foliis pallidis viridibus immaculatis, nec saturate viridibus maculatis." This is very important because it is in these points that *praetermissa* also differs. Bearing on this point we may allude to Haller, a contemporary, a correspondent, and a critic of Linnaeus who, doubtless, was aware of what Linnaeus' matured conception of *latifolia* was. Haller's figure of *O. latifolia* L., 1334, does not represent *praetermissa* but a plant with spotted leaves and strongly reflexed labellum-lobes, and is probably the continental concept of *latifolia* although perhaps not precisely the *O. majalis* Reichb. One need not waste time in defending Linnaeus from the charge made against him of mistaking disease-marks for the natural dark spots on leaves of the Marsh Orchid. To sum up, may I say the

description is the important part in defining a species, that figures, synonyms, and habitats may be helpful, but if these contradict the description, the description must have priority. What then is the answer to the question which forms the title to this note? We may confidently say that *sambucina*, *incarnata*, and *praetermissa* cannot represent *latifolia*, since the description does not apply. It may be *majalis* Reichb., or *purpurella* Steph., or it may be one of the hybrids of *maculata* with one of the members of the group *latifolia*. The retention of the name *latifolia* for any yet separated segregate seems as unwise as would be the attempt to use *Euphrasia officinalis*, *Viola tricolor*, *Rubus fruticosus*, or *Bursa pastoris* for any of their segregates. Those botanists with a "big thumb" may be content to ignore the critical species and may still cling to *O. latifolia* if it affords comfort, but any one engaged in phyto-geographical work or in systematic Botany may wisely drop the pilot and use a segregate name which means what it says, and has one meaning only.

2326. O. PURPURELLA Steph., Hybrids of. T. & T. A. STEPHENSON in *Journ. Bot.* 33, 1922. × *O. insignis* Steph. = *O. purpurea* × *latifolia*. Aberystwith and Arran. × *O. formosa* Steph. = *O. purpurea* × *ericetorum*. Ambleside and Arran. × *O. venusta* = *O. purpurea* × *O. Fuchsii*. Aberystwith, Ambleside, and Arran. × *Orchigymnadenia varia* = *O. purpurea* × *Gymnadenia conopsea*. Arran, with figure.

2327 (2). O. MACULATA Druce. Near Haile, Cumberland, June 1922, A. TEMPLEMAN. An extraordinary plant, with leafy bracts over an inch long, the petals narrow, and the labellum deeply cut, with the mid-division longer but narrower than the lateral, pale, pinkish, with faint markings. If *Fuchsii* and *maculata* grew there it may be × *transiens*.

2330. O. PYRAMIDALIS × O. MORIO. Ein neuer Gattungbastard. J. Braun-Blanquet in *Jahr. Nat. Ges. Graubünden* 167, 1921.

2338. HABENARIA GYMNADENIA. Under the title of Hybrids of *Gymnadenia conopsea* and *Coeloglossum viride* the Rev. T. and Mr T. A. Stephenson describe and figure this hybrid. It was first found

at Winchester by Mr Jackson in 1909. (See *Rep. B.E.C.* 12, 1917.) One of the forms was sent by the late Mr R. F. Burton from Longner, Salop. *Orchid Review* 101, 1922.

2361 (3). SISYRINCHIUM STRIATUM Sm. Ic. Pict., t. 9. Alien, Chile, etc. Hortal. Highcliffe, S. Hants, 1922, ST JOHN MARRIOTT. An ornamental garden plant, doubtless planted here.

2425 (6). COMMELINA ELLIPTICA H. B. & K. Nov. Gen. et Sp. i., 259. Alien, tropical America. Introduced with chicken-food at Limpsfield, Surrey, 1922, Rev. E. C. CRUTWELL. The pretty Peruvian Spider Wort is a plant one would not expect to occur as an alien in Britain. It is figured as *C. gracilis* in *Bot. Mag.*, t. 3047.

2433. JUNCUS SUBNODULOSUS × LAMPROCARPUS = J. DEGENIANUS Boros in Maygar Bot. Lapok. 41-2, 1922. This should be sought for in Britain.

2473. LEMNA MINOR L. La fiotura della—nell' Orto botanico di Firenze by R. PAMPANINI & T. PROVASI. Bull. Bot. Soc. Ital.

2485. POTAMOGETON NATANS × POLYGONIFOLIUS, var. RICHTSFELDII Fisch., forma HIBERNICUS Hagström. Killarney, Kerry, August 1911, DRUCE. [Ref. No. 3006.] "This has been much written about and very interesting. It is a very distinct hybrid which I have named forma *hibernicus*. See *Crit. Res. Pondweeds*, 193." Hagst., *in litt.*, 1921. It has masqueraded under other names, *i.e.*, *P. natans* L., var. *linearis* Syme. In *Rep. B.E.C.* 350, 1908, I referred it to *P. natans* × *polygonifolius*, and identified it with *P. gessnacensis* Fisch. Die Bayer Potam. 31, 1907. It is plentiful between the Upper and Middle Lakes of Killarney. Fryer's *crassifolius*, Hagström thinks is *gramineus* × *lucens* × *natans*.

2486. P. POLYGONIFOLIUS Pourr., var. CANCELLATUS (Fryer) Druce. Brousta, Shetland. Dr Hagström was very anxious to see specimens of this pretty plant, which he thought might prove to be a hybrid of *coloratus*. However, the plants I sent him induced him

to state positively that it was not a hybrid, nor is *coloratus* known there. It is extremely local.

2488. P. COLORATUS Vahl, forma TERRESTRIS Tiselius. Black Pan, Isle of Wight, Miss PALMER in *Hb. Druce*; Cothill, Berks, DRUCE.

× GRAMINEUS = P. BILLUPSII Fryer. Also at Wood Walton Fen, Hunts, DRUCE.

2488. P. COLORATUS × PUSILLUS = P. PERPYGMAEUS Hagström, *in litt.*, ined. *P. lanceolatus* Sm., var. *hibernicus* Ar. Benn. The plant was discovered by Mr P. O'Kelly in the Cahir River, Co. Clare. In June 1907 it was shown me by him. It grew in a rapid stream in a limestone area, but I could not find any *P. gramineus* growing with it, but the water was turbid from floods so my search was not exhaustive. As I said in *Rep. B.E.C.* 476, 1909, it did not strike me as identical with the Anglesey plant. Dr J. O. Hagström examined my specimen and (*in litt.*, 1919) suggested that while one parent was *pusillus* he believed that the second one was *coloratus*. The latter species was not on record for that area. In September 1921, I took Mrs Wedgwood to this place vainly hoping it might be found in fruit. The Cahir stream was then beautifully pellucid and we shortly found the above Pondweed in profusion and in very much better condition than that obtained on my first visit. A careful search also resulted in finding *P. coloratus* in some quantity—small specimens only, so rarely fruiting—thus corroborating the shrewd suggestion of Dr Hagström. Supplies of both plants were sent him and although near his end he wrote "this hybrid which I, ad interim, name *P. perpygmaeus* is the most interesting Ireland owns. I will write a note on it in my new book about the Potamogetons." *P. perpygmaeus* is also the *P. lanceolatus* which was discovered by Mr Arthur Bennett in Burwell Fen, Cambridgeshire, in 1880. *P. coloratus* and its hybrid, *P. Billupsii*, also occur in that place. The reddish colour of *coloratus* is also present in *perpygmaeus* which thus differs from the beautiful grass-green of the Anglesey *lanceolatus*. *P. perpygmaeus* is, as yet, unrecorded from the Continent.

2489. P. ALPINUS Balb., var. OBSCURUS Asch. & Graebn. Syn.

i., 312. Canal, Shipley, York, J. CRYER. A common British form which is not recognised as a variety by Hagström.

2489. P. ALPINUS × POLYGONIFOLIUS = P. SPATHULATUS Schrader in Koch & Ziz. Cat. Pl. Palat. 18, 1814. *P. Kochii* Schultz Archiv. Fl. Fr. and Germ. 72, 1842. Hagström (*Crit. Res. Potam.* 148, 1916) says there are two forms of this hybrid :—one (a) *palatinensis*, with the lower leaves petiolate, and (b) *suecicus*, with sessile lower leaves. The lower leaves of both forms are long-petioled with petioles as long or longer (rarely shorter) than the blades with their sloping bases; apex obtuse, as in *alpinus*. The stem-anatomy shows influence from both the parent species and can be said to be intermediate. It is known from Broby, in Helgea, Scania, and from "Rhein-Pfalz, Kaiserslautern," Germany. (Norway is misreported by Graebner in *Potamog.* 133, 1907.) I am able to give it a wider distribution since Dr Hagström identifies a plant which I gathered in St Ouen's Pond, Jersey, in 1907, as this hybrid. It grows with *alpinus*, *coloratus*, and *polygonifolius*.

2493. P. GRAMINEUS × POLYGONIFOLIUS = P. SEEMENII Asch. & Graebn. Syn. Mittl.-Eur. Fl. i., 335, 1897. *P. gramineus*, forma *lanceolatifolius* Tis. Exsicc. Suec. n. 139. Two forms are described by Hagström in *Crit. Res. Potamog.* 232—namely, a *lanceolatifolius* (Tis.) Hagstr. and *subcuspidatus* Hagstr. The plant gathered by Seemen at Borkum more nearly approaches *gramineus* but of the two forms mentioned above, *lanceolatiformis* occurs in the rivers Alsteran and Eman, and *subcuspidatus* at Pinneas in Scania. A doubtful plant gathered by Coles in Scotland may possibly belong to this. "The submerged leaves are very characteristic, their base, lanceolate, with a short stalk, or with the lamina narrowly decurrent as far as the insertion, often with a conspicuous, waist-like contraction between the stalk-like part and the blade; margin often untoothed but, sometimes from the same locality, a very faint rudimental serrulation at greater enlargement grows visible; apex equally tapered (*polygonifolius*) and mostly sharp (*gramineus*). Also the structure and nervation are intermediate." Last September Mrs Wedgwood and I made a somewhat adventurous journey to Ireland just after the truce. We visited and searched the River Laune below Killarney and near Ballymalis Castle in search of

Equisetum trachyodon, and dredged some Pondweeds which grew plentifully there. One of them was a new form evidently allied to *gramineus*. I sent a gathering to Dr Hagström (whose death we so greatly deplore), and although on a sick-bed he kindly identified them with the above hybrid, which is thus for the first time identified from the British Isles. My plants belong to the var. *lanceolatiformis*. G. C. DRUCE.

2495. × P. NITENS Web. (GRAMINIFOLIUS × PERFOLIATUS), var. SUBPERFOLIATUS Hagstr., forma FLUMINEUS Hagstr. This differs from the variety by its larger, cordate, submerged leaves, 80 x 12 cm. I found it in Loch Spiggie, Shetland, in 1921. Plants distributed this year. G. C. DRUCE.

2503. P. CRISPUS × PERFOLIATUS = P. COOPERI Fryer, var. SERRATUS Hagstr. This differs from Fryer's type *Cooperi* by the ' folia serrato-dentata.' Hagstr. *Crit. Res.* 62. The plants grew in the Canal at Lichfield, Stafford, with *P. Lintoni*. G. C. DRUCE.

2505. P. ACUTIFOLIUS × PUSILLUS = P. SUDERMANICUS Hagstr. Ditch, near Camber Castle, E. Sussex, 1900, C. E. SALMON. See Arth. Bennett in *Journ. Bot.* 55, 1922.

2508 (2). P. FOLIOSUS Rafinesque in Med. Repository, v., 354, 1808. *P. pauciflorus* Pursh Fl. Am. Sept. i., 21, 1814. Alien, N. America, Canada, Nova Scotia to California, Jamaica, Cuba. Discovered by W. S. M. D'URBAN in the deep water of Canal Double Locks, near Exeter, on 18th August 1921. This is the second alien Pondweed in Britain. Another alien aquatic grows in the Exe, near Exeter, *Sagittaria heterophylla*. G. C. DRUCE.

2511. P. INTERRUPTUS Kit. = P. FLABELLATUS Bab. Hagström has seen all my most characteristic specimens of Babington's *flabellatus*. He refers them to *P. pectinatus* L., *in litt.*, 1921. In *Crit. Res.* he says (p. 41) that " it may nowadays by all investigators be acknowledged to be a *pectinatus* form." Our strong form from the Thames he names var. DIFFUSUS, forma PINGUIS Fisch. Cherwell, Oxon; canal, Wantage, Berks; River Wey, Surrey, etc.

2612. CAREX CANESCENS × STELLULATA. O. EKLUND in *Meddel. Soc. Faun. et Fl. Fennica* 95, 1921. This I have gathered on Ben Lawers, and I saw it in Norway in 1922.

2614. C. MURICATA and C. PAIRAEI. See note by A. W. STELFOX in *Irish Nat.* 31, 1921.

Gen. 635 (1). PASPALUM L.

2631 (10). P. RACEMOSUM Lam. *P. stoloniferum* Willd. Alien. Bristol, Mrs SANDWITH. Det. W. B. Turrill.

2635 (10). PANICUM TERNATUM (Stapf) Druce, nov. comb. *Digitaria ternata* Stapf in Dyer Fl. Cap. vii., 376. Alien, South Africa. Bradford, Yorks, 1917, coll. J. CRYER.

2645. ZEA MAYS L. Inheritance of the Ramose Inflorescence in Maize. J. H. KEMPTON in U.S. Dept. of Agric. Bulletin 971, December 1921. The branched-ear variation is the *Zea ramosa* Gernert in *Amer. Nat.* v., 46, n. 550, 616-622. Behaves generally as a simple, Mendelian character recessive to the normal condition.

2662. ALOPECURUS PRATENSIS L., var. CAESIUS A. Schwarz. [Ref. No. 2494]. Pasture, West Barnes, Merton, Surrey, June 1922. Distinguished by reason of the glaucous stems and sheaths, the latter more inflated than in the type. C. E. BRITTON.

2662. A. PRATENSIS L., forma MASONII mihi. This differs from the type in the much longer anthers. They protrude so far as to give the panicle a look of *Plantago media*. Melmerby, Cumberland, Rev. W. WRIGHT MASON. In the Scottish plant the anthers are longer than those in the common British form. This, too, is usually the case with *Phleum pratense*. G. C. DRUCE.

2673. PHLEUM PRATENSE L. Under the name, Timothy Grass (*Farmers' Bulletin*, n. 1254, U.S.A. Dept. of Agric.), this grass is said to be by far the most important hay grass cultivated in America, the quantity grown being four times as great as of all other hay grasses. As early as 1807 it was the most important hay grass. It is acknowledged to be an introduced species from Europe. The specimen figured seems to be the Scotch Timothy which is closely

related to, if not identical with, the form or variety *P. intermedium* Jord. in that it has, at the base, one or two thickened internodes each of which is of annual duration. The number of seeds in a pound of Timothy is 1,200,000, and a bushel weighs from 42-60 pounds.

2684. AGROSTIS ALBA L. *A. palustris* Huds. (*Farmers' Bulletin*, n. 1254, *l.c.*). In this work it is called "Redtop." It was early introduced into the American colonies. "No other grass will grow under as great variety of conditions as Redtop." Most of the seed is produced in Illinois. It is smaller than that of any other commercial grass, a pound containing 4,000,000 seeds and a bushel of the chaffy seeds weighs 14 lbs., but when recleaned as much as 36 pounds.

2685. A. TENUIS Sibth. (*Farmers' Bulletin*, p. 33, *l.c.*). The Rhode Island Bent, the American name, according to Mr Piper, is the most common and abundant grass on well-drained soils in New England and New York, but it is believed that it was introduced from the Old World. It thrives best on acid soils, as it does in Britain. Dr Thellung has recently shown that its more correct name is *A. capillaris* L.

2702. AMMOPHILA ARENARIA Link, var. (vel forma) nov. RAMOSA. Found by Mrs WEDGWOOD, in August 1922, at Yarmouth, E. Norfolk. It differs from the type by its lax, compound panicle, the lowest branch reaching to about midway of the five-inch inflorescence. There is no suggestion of hybridity. G. C. DRUCE.

2717. AVENA. Under the title of "Varieties of Oats in Cultivation," Mr C. V. B. MARQUAND has contributed a valuable paper which is printed in a *Report of the Welsh Plant Breeding Station*, series 6, n. 2, 1922; price 5s 6d. A paper on *A. strigosa* Schreb. and its forms has already been published in the *Report*. In addition, Mr Marquand gives *A. brevis* Roth, a continental oat, readily distinguished from *strigosa* by its very short grain, 7-11 mm. in length. Of *A. fatua* he gives three varieties:—(1) PILOSISSIMA Gray. Young plant prostrate; tillering capacity very great; frequently as many

barren shoots formed as those producing panicles; leaf-sheaths pubescent; lamina long; marginal hairs extending from the base up to ½-¾ of its length; ripe grains dark brown, 14-18 mm. in length; a dense tuft of brown hairs, 1.5-4 mm. long, on the upper part of the callus surrounding the sucker mouth. (2) PILOSA Druce. Differs from var. PILOSISSIMA in the character of the grain, which becomes olive-coloured when ripe, and is very sparsely covered with pale yellowish hairs from the base to the point of attachment of the awn; a tuft of pale grey hairs, 1.0-2.0 mm. on the callus. (3) GLABRATA Peterm. Young plants prostrate to sub-erect; marginal hairs usually extending up the lamina to near the apex. Agreeing with *pilosissima* in other characters except in the grain which is somewhat broader than in that variety, becoming pale yellowish on maturity. The callus bears a dense, circular tuft of spreading, whitish hairs, 2-3.0 mm. long. Mr Marquand remarks that this variety, which has been known for some years, may have originated as a mutation from one of the earlier, cultivated varieties with solidified, basal articulation (*A. sativa*) and is thus really a wild base. Dr Thellung, I believe, considers it to be a hybrid of *A. fatua* × *sativa*. *A. sativa* is distinguished from *A. fatua* by the absence of awns on the upper grains and by the attachment of the grain. Of this he gives two new sub-species—VERNA and AUTUMNALIS—and under it he also places, as a sub-species, A. ORIENTALIS (Schreb.). The very numerous cultivated forms are fully described. A. NUDA L., with four varieties, is given. The Oilcorn, as it was called, is no longer cultivated in Britain. A. STERILIS L. has two varieties, *i.e.*, var. MAXIMA Perez Lara and LUDOVICIANA Gillet. The latter appears as a casual in Britain. It differs from the type in having only two, or rarely three, grains in the spikelet (type 3-5), the glume is 16-19 mm. long (type 35-52) by 5.5-7.0 mm. broad (type 9-12); grain 16-19 mm. long (type 32-38). The awn in both is long, geniculate, and twisted. Of this there is also a sub-sp. CULTA. Several varieties are given. Some good photographic illustrations are appended.

2724. ARRHENATHERUM ELATIUS (L.) Beauv. (*Farmers' Bulletin*, n. 1254, p. 18, U.S.A. Dept. of Agric.). Tall Meadow Oat-grass. The seeds, which are of low vitality, go 150,000 to a pound, and a

bushel weighs 10-16 pounds. Nothing in the Bulletin is said about *A. tuberosum*. It became established in the States about 1807.

2727. CAPRIOLA DACTYLON Kuntze. (*Farmers' Bulletin*, n. 1254, *l.c.*). Under the faulty name, *Cynodon Dactylon* L., the Bermuda Grass is described as being the most important grass in the South where it shows a marked preference for clayey soils. Three well marked varieties occur. Good seed is produced in Arizona, California, and Australia. 1,800,000 seeds go to a pound and a bushel weighs from 35 to 36 pounds. With regard to the name Linnaeus called it *Panicum*, not *Cynodon*, a genus which we owe to Persoon, who established it in 1805, but Adanson, in 1763, had named it *Capriola*. It is one of many instances of an improper name being conserved by the Vienna Actes.

2751. DACTYLIS GLOMERATA L. (*Farmers' Bulletin*, n. 1254, *l.c.*) Under the name, Orchard Grass, it is said to grow in nearly every State in the Union, but there is no great demand for it. The number of seeds in a pound is half a million, and a bushel only weighs 14 pounds.

2759. POA PRATENSIS L. Kentucky Blue Grass. (*Farmers' Bulletin*, n. 1254, *l.c.*). Next to Timothy in importance in the States comes this grass. Like Timothy it is an introduction from the Old World. Although it does best on limestone it is not peculiar to that soil. Each pound contains 2,400,000 seeds, and a bushel weighs 14 pounds. It would be interesting to see which form of *pratensis* is referred to. The name suggests it may be *subcærulea*.

2761. P. TRIVIALIS L., var. SEPTENTRIONALIS Druce Fl. Zetl. 539, 1921. Characterised by its larger florets with purplish black outer glumes. The plant has numerous offsets above the surface so that it gives more foliage than the common forms. The florets are about 20 per cent. larger than those of the common midland plant. Specimens distributed this year. Tingwall, Lerwick, Balta, Burrafirth, etc., Shetlands, G. C. DRUCE.

2761. P. TRIVIALIS L., var. STRICTA Döll. Cultivated field, Lower Morden, Surrey [Ref. No. 2502], June 1922. This is similar

to the var. *rigidior* Fl. Ingr. (see *Rep. B.E.C.* v., 56, 1917), but Döll's name is probably earlier.

2765. P. COMPRESSA L. (*Farmers' Bulletin*, p. 17, *l.c.*). The Canada Bluegrass, as it is called, was introduced from Europe and is largely grown in Canada. Although undoubtedly inferior to *P. pratensis* it is of much more importance than agricultural writers generally admit, and will do better than *pratensis* on stiff clays, but is suited for pasture rather than for hay. 2,700,000 seeds go to a pound, and a bushel weighs from 14 to 24 pounds.

2776 (2). PUCCIANELLA FESTUCIFORMIS (Hayne). In *Suppl. Fl. Cornw.* 155, 1922. This is recorded from Egloshayle Marsh, 1918, by E. THURSTON and named by Dr Stapf. The grass is so critical that, despite the high authority as to its name, until one has seen a series of it I hesitate to accept an Adriatic plant from Cornwall as British when its very close ally *P.* or *G. maritima*, var. *hibernica* occurs in Ireland, Dorset, Hants, Sussex, and Kent. Even *festuciformis* may not be specifically distinct from *maritima*.

2781. FESTUCA ARUNDINACEA Schreb. Mr T. F. JENKIN has sent a note saying that in making a critical examination of this and its allies he finds *arundinacea* has the ledge of the auricle (*i.e.*, the margin) fringed with rather stiff hairs. The *pratensis* types have no such hairs. This fact does not seem to be previously recorded. Will members kindly assist in seeing if this is usually the case?

2782. F. ELATIOR L. (*Farmers' Bulletin*, p. 20, *l.c.*). As Meadow Fescue or English Bluegrass has not received due attention in the States. Mr Piper says *F. pratensis* and *elatior* are merely medium and tall varieties of the same species. The seed of *elatior* is highly germinable and 240,000 go to a pound, and a bushel weighs 25 pounds.

2785. F. RUBRA L. (*Farmers' Bulletin*, n. 1254, *l.c.*). In the States it is used mainly as a lawn plant, and there are two varieties, one, the type, and the other, "Chewing's Fescue from New Zealand," which Mr Piper calls *F. rubra fallax*, but whether it is the *F. fallax* of Thuillier is conjectural. Half a million of seeds go to a pound, and a bushel weighs 10-15 pounds.

2786. F. OVINA L. (*Farmers' Bulletin*, p. 27, *l.c.*). It is said to be native of the Great Lakes area and along the Rocky Mountains. It is an excellent grass to grow on poor, sandy soil, while the bushel of seeds weighs about the same as those of *F. rubra*. The seeds are smaller as a pound contains 680,000.

2823. LOLIUM MULTIFLORUM Lam. (*L. italicum*). (*Farmers' Bulletin*, n. 1254, p. 30, *l.c.*). Under the name, Italian Rye-grass, it is said to be not truly an annual, but under farm conditions few of the plants live more than one year, and the yield of it is much less in the States than in Europe. 280,000 seeds go to a pound, and a bushel weighs 24 pounds. Under *L. italicum* the name of the author is given as Robert Brown. This is not so, the author is A. Braun. It is not quite certain that *L. multiflorum* and *italicum* are synonymous. The former is supposed to be the wild plant, *italicum* the cultivated form. *L. Boucheanum* Kunth, 1829, is earlier than Braun's name.

2824. L. PERENNE L. (*Farmers' Bulletin*, p. 32, *l.c.*). The Perennial Rye-grass is also known in the States as English or Australian Rye-grass. It is said to be the first of all perennial grasses to be grown in pure culture for forage in England in the seventeenth century. The seed germination is good. 280,000 go to a pound and a bushel weighs 20 pounds.

2848. HORDEUM NODOSUM L. (H. SECALINUM Schreb.), ? var. BREVISUBULATUM (Trin.) Thellung. *H. secalinum* Schreb., var. *brevisubulatum* Trin. Sp. Gram. 1, t. 4, 1828. Planta paulla nota e Sibiria descripta. Det. A. Thellung, March 1922. Greenford, Middlesex [Ref. No. 1757], coll. J. E. COOPER; comm. G. C. BROWN.

2860. JUNIPERUS COMMUNIS L. Om variations formagan hos eren *Meddel. Soc. Faun. et Fl. Fennica* 11-15, 1921.

2862. TAXUS BACCATA L. The size of Yew Trees. J. RENWICK in *Garden* 205, 1921.

2862. T. BACCATA L., var. FASTIGIATA Loudon. The Irish Yew is generally (? always) female. It is said to have originated as a

mutation in Fermanagh, and if the Irish Yew trees grown in England have all been propagated by cuttings the sex-character would be explained. See C. J. BOND in *Nature* 810, 1922, who asks for male examples of the Irish Yew. He has young plants raised from the berries of *fastigiata* fertilised by pollen from the type *baccata*. These are as yet barren but show a graded series from the Irish to the English Yew.

2865. LARIX DECIDUA Mill. In the *Gardeners' Chronicle* for May 20, 1922, p. 258, Mr A. D. RICHARDSON treats of the introduction of the Larch into Britain. The popular idea is that the Dunkeld Larches were the first to be planted. One of these still remains. The other was blown down prior to 1911. The members of the Phyto-Geographical Excursion were photographed standing round the base of the trunk. It was said by Loudon to have been planted in 1727, and the popular version is that the Larches were first treated as greenhouse plants, but were thought to be dying and were thrown on a rubbish-heap where they took root and soon became vigorous. But another claimant for precedence came in for Dick Lauder says the Larches at Dawick, Peeblesshire, were said to have been planted in 1725. Mr Richardson, however, states that the Larches at Arniston House, in Midlothian, overlooking the South Esk, about 500 feet above sea level, were planted in 1738, and are smaller than the Dunkeld trees, girthing, as they do, 11 feet at five feet from the ground. From the Arniston Memoirs he is led to believe that the Dunkeld trees were planted in 1727, but whether before or after the Dawick trees is uncertain.

2878. BLECHNUM SPICANT With., var. BIFIDUM Wollaston. Leith Hill, Surrey [Ref. No. 2537], August 1922, C. E. BRITTON.

2878 (2). B. TABULARE (Thunberg) Kuhn Fil. Afr. 94, 1869 = LOMARIA MAGELLENSE Desv. Alien, S. America, etc. A specimen was sent me by Mrs THOMPSON which had been gathered near Megavissey, Cornwall, by Dr BALGARNIE. Doubtless planted.

2907. POLYPODIUM VULGARE L., var. SERRATUM Moore. [Ref. No. 2556]. Lane between Gate Cottages and Beckley Furnace, E. Sussex, September 1922, C. E. BRITTON. See *Our Native Ferns* i.,

38, f. 18, where it is recorded for Hereford, and near Hutton Railway Bridge, Malton.

2924. ISOETES. Anatomie und Systematik der Gattung Isoetes U. WEBER in *Hedwigia* 219-40, 1922.

2932 (3). SELAGINELLA DENTICULATA Link fil. Sp. H. Berol. 159. Alien, Mediterranean region, etc. Hortal. Well established in an orchard at Landewednack, Cornwall, H. DOWNES. See *Rep. B.E.C.* 586, 1921.

NOTES ON PUBLICATIONS, NEW BOOKS, ETC., 1922.

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

ADAMSON, R. S. Studies of the Vegetation of the English Chalk —I, The Woodlands of Ditcham Park, Hampshire, in Journ. of Ecol. 113-219, 1922.

AMES, O. ILLUSTRATIONS AND STUDIES OF THE FAMILY ORCHIDACEAE. The Orchids of Mount Kinanulu, British North Borneo. Note on Phillipine Orchids. Royal 8vo., tt. 22, pp. 335. Wheldon & Wesley, London, 1922; 50/-.

ARMITAGE, ELEANORA. The Twenty-seventh Annual Report of the Moss Exchange Club, June 1922. The Treasurer writes in the *Report*, "It is evident that two [Moss Exchange] Societies are a source of weakness instead of strength," and it has been impossible to complete the "issue of new editions of the Census Catalogues of the Club." Perhaps the establishment of the combined bryological society may solve the difficulty.

AULIN, Fr. R. En flikbladig form av *Rhamnus Frangula* L., in Svensk Bot. Tids. xvi., 301-302, 1922.

BABINGTON, C. C. MANUAL OF BRITISH BOTANY. Tenth edition; edited by A. J. WILMOTT. Gurney & Jackson, London; pp. liv., 612, 1922; 16/-. In the Seventies and Eighties the publication of a new edition of "Babington" caused great excitement among British botanists. Each edition, the result of personal work, was well brought up to date. Every page showed the careful attention given to it by the author, who kept himself in touch with contemporary botanists. He was, besides, an acknowledged referee on Rubi. But Babington has long passed away. His personal influence is only in the memory of a few, and some of the few have lost touch with their common subject. So that now the *Manual* has to appeal to a different set of readers. Vast changes in nomenclature have taken place and different views as to the grades of plants are now held. Mr A. J. Wilmott has edited the present edition which the publishers have produced in a very compact form, so that it is especially convenient for the field-botanist. Considering the cost of printing and binding the price, 16/-, cannot be called dear for its 666 pages. No mention is made of the previous edition, which was so ably edited by Messrs Groves. This omission seems almost unaccountable, unless it was owing to Mrs Babington, the somewhat arbitrary possessor of the copyright, whose frame of mind respecting the sanctity of the descriptions and names used in the *Manual* was so peculiar that it led to the 9th edition being less valuable than would have been the case had the Editors been allowed a clear hand. One is somewhat surprised in the circumstances to see such innovations in nomenclature as are now made, while the retention of the hoary errors of the old editions are still perpetuated. The practice is retained of enclosing the name of the author of the species in brackets, which is not only contrary to universal custom, but also conveys an entirely false impression—as if, for example, *Ranunculus Lingua* (L.) was either established as a variety or under some other generic name by Linnæus. The innovation is, perhaps, worth discussing. One feels sure that the citation of '*Lychnis dioica* L., em. Mill.,' '*Papaver dubium* L., em. Lamotte,' '*Arenaria serpyllifolia* L., em Guss.' would have been repugnant to Babington. The greatest debt botanists owe to Linnæus was his introduction of the consistent use of binomial names. In the days of the herbalists, when the known species of plants were few, and when no dominant system of classi-

fication was in use, plant names were more or less descriptive and were often lengthy. As one sees from the MSS. of the Dillenian *Pinax*, botany was being strangled by the exuberance of its lengthy names of plants. Linnæus had the intuition to see that by using a binomial name an enormous amount of writing would be saved, and a heavy tax upon the memory would be avoided. And with few exceptions, and these were only of a temporary kind, the change was welcomed and adopted. For a century and a half the beneficent reform has been enjoyed. Unfortunately in the hasty proceedings at Vienna in endeavouring to avert undue creations of new names, the introduction of a ternary method was, if not enforced, at least made permissible in cases where there is an obscurity of definition, or where 'species' covered more than one, or in cases where two species were combined under an old name. See Art. 44 where, surely, the intention is to use a second author's name only in such cases which were absolutely necessary. Although examples of species only are given it applies to genera which are more fluid than species. See also Art. 41 where it is suggested (I think most unwisely) to write *Globularia cordifolia* L. "excl. var b.," while Art. 40 says it is necessary to quote the author who first published the name. One may ask—does such a citation as *Ulex europæus* L., "em. Roth," or *Genista tinctoria* L., "diagn. em. Willd." really help botanists? Those who have only an elementary knowledge of nomenclature—itself not a popular subject—have enough to do to remember the authority for the name. As to where Roth or his emendations are to be found is beyond him. Nor will such works as are at his disposal assist him. He who is better informed as to the methods and limitations of Linnæus does not want to be told. He knows that the descriptions in the *Species Plantarum* are often inadequate or even incorrect, that they may differ from his herbarium specimens, and that the synonyms often do not apply. In the majority of cases, however, it is not difficult to fix the species name or the type. With regard to every species that has been described, our knowledge of it is not final, and there is no reason to add a second authority, because, if not already, it may be only to-morrow that another emendator may have to be recognised. Again the mere citation, "emend. Reichb." is quite inadequate. One wants to know which Reichenbach and in which work this so-called emendation occurs. The

monumental *Index Kewensis* or *Genera Siphonogamarum* would give no help. In field botany, both in Britain and elsewhere, plants are often spoken of by the specific name. Therefore the highest importance must be put on the retention of the original trivial. The exceptions to this rule should be of the fewest. Personally I should accept (as is done by the American school and by zoologists) duplicated names such as *Coronopus Coronopus* rather than wander about in a quagmire of *C. Ruellii*, *C. verrucarius*, *C. procumbens*, *C. squamata*, &c., all of which would have been avoided by the duplication of the trivial, even if for a moment the risibility of Engler's students had to be faced. One might " have heard the smile " but it would have been as evanescent as the choice of some of the foregoing alternatives. So, too, the so-called " totgeborenen " names might have been allowed resuscitation, or rather need not have been strangled as they somersaulted into the world. In the field we talk of *Filix-mas* and give comparatively little heed as to whether it is associated with Schott, Richard, Presl or Swartz, and the coupling of each of these authors with " emend. someone " causes annoyance and creates an exactly opposite effect to what is the true aim of nomenclature. Art. 3 states, " The rules must be simple and founded on considerations clear and forcible enough for every one to comprehend, and be disposed to accept," and in Art. 4 the essential points are (1) to aim at fixity of names; (2) to avoid the use and forms of names which may cause error or ambiguity, or throw science into confusion." In a monograph of a genus such details can be supplied, if thought necessary, but for every day citation it is a waste of time and space and has no compensating advantages. For instance, why write " *Lotus corniculatus* L., emend. Reichb." when for the last 50 years *L. corniculatus* L. has practically meant the same thing the world over. In an ordinary British Flora a description of *L. corniculatus* L. would be given and if it is worth a tinker's curse the description there should be adequate to distinguish it from its allies without any reference to Reichenbach or other author. There is only one thing worse than the employment of this method, and that is its erratic employment. Why write *Matricaria inodora* L. without an emendation? Why, as in the *Manual*, should *Spiræa*, *Daucus*, *Conium*, and *Viscum* all be ascribed to Linnæus without an " emend."? *Viscum* L. consists of

plants now referred to five different genera, and the others are in the same category as many of those which are cited L., emend. So, too, among others, *Achillea*, which includes also species of *Lonas*, *Pyrethrum*, and *Tanacetum* is simply cited " L." while *Anthemis* L. is "emend. Koch." Enough has been said. It may be that some may like the method but I am old-fashioned enough to dislike a plan which adds to difficulties and affords no help. One wishes that the time spent on adding these 'emends,' and it must have been quite considerable, had been given to correcting errors and in amplifying the information in the text. How strangely inadequate are the statements that *Matricaria discoidea* is " established in many parts of Ireland, Cornwall, and elsewhere," that *Diotis* is " extinct in England," or the references to *Senecio Cineraria*, *S. squalidus*, and other species. Among the new combinations is *Vicia varia* (Wilmott) which, it is suggested, should replace *V. gracilis* Lois., on the faith of Brotero's *Ervum varium*, published in the *Flora Lusitanica* of 1804 which appears to be the earliest trivial. If Mr Wilmott means consistently to use the oldest trivial I welcome it. According as I read the existing rules the trivial is invalid since there is already a *Vicia varia* Host. established in *Flora Austriaca* in 1836—a combination earlier than 1922. The adoption of the permanency of the oldest trivial (under whatever genus it may have been established) as against a combination of a more recent date in which that trivial is used might possibly cause an alteration of 200-300 names but its adoption would do away with another of those troublesome exceptions which make botany so burdensome.

Mr Wilmott has ably described the additions in the Appendix II., where he says only " the more important advances are noticed," but, following Babington's practice their sources might have been supplied. They include *Ranunculus Aleae* Willk. (which perhaps should be Moss not Willkomm since true *Aleae* awaits discovery in the place where it was said to be a feature). Specific grade is given to *Nymphaea occidentalis* Moss which Ostenfeld named as a variety. It has not yet been shown conclusively that it differs from De Candolle's var. *minor*. It certainly differs from the standard of species set in the *Manual*. It has been questioned if the Yorkshire and Lancashire

plants belong to *Sagina Reuteri*. Specific rank, again, is given to that exceedingly thin plant *filicaulis* as apart from *Alchemilla minor* Huds., which rejoices as "*A. minor* Huds., not of Lindb., not of Buser, and other continental botanists." Under *M. piperita*, Linnaeus is given as the author although he made it a species, not, as it is now considered, a hybrid, and that is a great emendation. It is suggested that *Arctium vulgare* should be replaced by *A. intermedium* Lange. But is not the older and correct name *A. nemorosum* Lejeune? Among the numerous omissions are *Nitella spanioclema* and *Tolypella nidifica*. *Euphrasia succica* is not noticed although Wettstein and the Swedish botanist named my plants as they did those of *E. fennica*. At least they are as good an authority as those who suggested the latter was a slender *E. Rostkoviana*. Linnaeus did not describe *E. minima*. E. S. Marshall is incorrectly given as the authority for *Rhinanthus borealis*, *monticola* and *Drummond-Hayi*. I placed these plants, which had been called *Alectorolophus* by Sterneck, in the Ann. Scot. Nat. Hist. 178, 1901, not in synonymy, as is wrongly stated in Ind. Kew. Supp. 216, 1911-15, but as "three new British species of Rhinanthus," thus much antedating Mr Marshall's transference of them to the same genus. This he acknowledges in the tenth edition of the *London Catalogue*. *Rhinanthus stenophyllus*, which is attributed to me, is to be found in the Index to Schur's work (in the text, if I remember rightly, he called it a variety). I do not claim to have 'emended' *Orchis maculata* L., the description in the *Species Plantarum* is precise enough to distinguish it from *Fuchsii*. Indeed it is more precise than the description of *Crataegus Oxyacantha* in the same work which is used by continental botanists in the sense of *oxyacanthoides*. Under *Potamogeton rutilus* Shetland might have been added. The trivial, *Habenaria chloroleuca*, is still retained notwithstanding there is an earlier combination of that name. *H. virescens* retains the oldest available trivial. There are no references to *Glyceria festuciformis* or to *Plantago Sabrinae*. Under the Elms we have an example of making a fetish of a trivial. The name, *Ulmus campestris*, has been interpreted in so many ways that its use is only a source of confusion. Linnaeus meant practically any European Elm. The specimen in the herbarium is not the English Elm. Nor are the synonyms given or the habitat that of the

English Elm. What is it that is sacrosanct? It was (wrongly as I think) sought to fix the name *campestris* by a reference to Ray's *Synopsis* in the *Flora Anglica*—a work which should be outside the pale of citation for binomials. In the *Manual* it is cited "*U. campestris* L., emend. Bab." But Smith (*Comp. Fl. Brit.* 40, 1800) had already used it for our British Elm. He only had two species, while continental authors had used it in quite a different sense. If *campestris* be retained for the English Elm it involves "*U. campestris* L., non syn. nec habitat nec Herb., emend. Sm., Bab., Henry, Moss, not of Kerner et auct. var." It would be much wiser to describe under a new name such as *U. anglica* our English Elm, since the arboriculturists who have most closely studied it ascribe it to two different species of Miller. Both cannot be correct. Other names are in this category—*Rubus fruticosus*, *Ranunculus aquaticus*, *Ophrys insectifera*, and *Orchis latifolia*. Their retention only leads to confusion. In such cases, and perhaps in the case of *Rosa villosa*, which I believe was given as an illustration in the Vienna Actes, the sentimental reason for retention is outbalanced by the advantages of using a name free from ambiguity and which requires no qualification, emendation, or gloss.

The Manual thus gives us much to ponder over and to give a kindly thought to the veteran botanist, almost the last of the professional systematists, who compiled it and who, although he ran the gauntlet of severe criticism, bore it manfully and was always willing to correct any mistake he might have fallen into, or to add anything to his descriptions which he thought would render them of greater assistance.

It may be well to give the dates of the various editions of the *Manual*. Ed. 1, pp. 400, 1843; ed. 2, pp. 428, 1847—(mine is Prof. Lawson's interleaved copy with Durham notes); ed. 3, pp. 434, 1851; ed. 4, 1856; ed. 5, pp. 448, 1862; ed. 6, 1867; ed. 7, pp. 472, 1874; ed. 8, pp. 485, 1881; ed. 9, edited by H. & J. Groves, pp. 580, 1904; ed. 10, edited by A. J. Wilmott, pp. 621, 1922.

Bailey, L. H. The Apple Tree. pp. 117. Macmillan & Co., Ltd., New York and London, 1922; 7/-.

Bateson, Prof. W., F.R.S. Lecture given before the American Association for the Advancement of Science at Toronto, December

21, 1921. The conclusion of an admirable lecture was occupied in an appeal to systematists. "Only those who are keeping up with these new developments can appreciate fully their vast significance or anticipate the next step. That is the province of the geneticist. Nevertheless I am convinced that biology would greatly gain by some co-operation among workers in the several branches. I had expected that genetics would at once provide common ground for the systematist and the laboratory worker. This hope has been disappointed. Each still keeps apart. Systematical literature grows precisely as if the genetical discoveries had never been made, and the geneticists more and more withdraw each into his special 'claim' —a most lamentable result. Both are to blame. If we cannot persuade the systematists to come to us, at least we can go to them. . . . Both we and the systematists have everything to gain by a close alliance. Of course we must specialise but I suggest to educationists that, in biology at least, specialisation begins too early. In England certainly harm is done by a system of examinations discouraging to that taste for field natural history and collecting, spontaneous in so many young people. . . . With us attainments of that kind are seldom rewarded, and are too often despised as trivial in comparison with the stereotyped biology which can be learned from text-books. Nevertheless, given the aptitude a very wide acquaintance with nature and the diversity of living things may be acquired before the age at which more intensive study must be begun, and is the best preparation for research in any of the branches of biology. The separation between the laboratory men and the systematists already imperils the work, I might almost say, the sanity of both."

BEAUVERD, G. Phanerogamarum Novitates. Bull. Bot. Soc. Genev., 10, 1921.

BECK, G. Plantae Europaeae hactenus non indicatae. Fedde Repert, 449, 1921.

BECK-MANNAGETTA. Orobancheae Novae. Fedde Repert, 33-40, 1922.

BENNETT, ARTHUR. *Hippophae Rhamnoides* L. and its Names. Naturalist, 157-158, 1922. *Statice* and *Atriplex* in Lincolnshire.

Naturalist 197, 1922. *Pyrola rotundifolia* Linn., in Caithness, with Notes on the Genus, in *Trans. Bot. Soc. Edin.*, vol. xxviii., pt. 2, 71-6, 1921.

BITTER, G. Zur Gattung *Physalis*. Fedde Repert, 5-7, 1922.

BLATTER, Prof. E., and D'ALMEIDA, Prof. J. F. THE FERNS OF BOMBAY. 8vo., pp. viii., 228. Taraporevala & Sons, Bombay, 1922; 7.8 rupees.

BLOMEFIELD, LEONARD. A NATURALIST'S CALENDAR KEPT AT SWAFFHAM BULBECK, CAMBRIDGESHIRE. Edited by Sir Francis Darwin. Camb. Univ. Press, 1922; 3/6.

BORNMULLER, J. New Species and Forms of *Filago* from Persia, Palestine, and Egypt. Fedde Repert, 40-43, 1922.

BRIQUET, J., and CAVILLIER, F. Autobiography of Emile Burnat, 1828-1920. Published at the Conservatoire Botanique, Genève, 1922. Burnat was the author of the excellent *Flore des Alpes Maritimes*. His large Herbarium contained over 200,000 sheets.

BRAIN, W. J. The Big Tree of Tule, in Kew Bull. 199, 1922. *Taxodium mucronatum* Tenore. Kew possesses three trees presented by Mr H. J. Elwes, which are now 7 to 9 feet high. They resemble *distichum*, but are not at Kew completely deciduous. In the Museum, No. 3, there are two good photographs of the tree at Tule taken by Mr Thos. C. Ellis in 1898. I have one given me by Lord Farrer. The Gardeners' Chronicle (350, 1867) says this tree at Santa Maria di Tula, in Oaxaca, had a circumference of 117 feet 10 inches, and was variously estimated at 6000, 5352, and 3882 years old.

BRANDRIS, Sir DIETRICH. INDIAN TREES. 8vo. Constable & Co., London, 1921; 40/-.

BRITTEN, JAMES. Friedrich Ehrhart and his Exsiccatae. Journ. Bot. 318, 1922. A valuable contribution to the history of this important set.

BRITTON, NATHANIEL LORD. Studies of West Indian Plants, X. Contrib. New York Bot. Garden, No. 236, pp. 327-43, 1922. Contains 37 new species from Trinidad; 4 from Jamaica; 6 from Cuba, and one, *Tournefortia barbadensis*, from Barbados.

BRITTON, N. L., and ROSE, J. N. THE CACTACEAE. Vol. iii., 4to., pp. vii., 255, tt. 24. Carnegie Institute of Washington, 1922.

BROWN, N. E. *Mesembryanthemum* and Some New Genera Separated from it. Gardeners' Chronicle, 1922. We are glad to see an appreciative notice and a portrait of Mr Brown in the same paper for April 1922. Attention is properly drawn to the ready help and kindly manners of the distinguished botanist.

BRUNKER, J. P. Plants of Co. Dublin, in Irish Nat. xxxi., 94, 95, 1922.

CABALLERO, A. Nuevos datos respecto de la accion de las Chara en las larvas de los mosquitos, in Bot. R. Soc. Espan. Hist. Nat. 61-64, 1922.

CAMUS, E. C., and A. ICONOGRAPHIE DES ORCHIDEES D 'EUROPE ET DU BASSIN MEDITERRANEEN. Folio atlas, tt. 120, with explanatory handbook. Plain, 100 fr.; coloured, 500 fr. P. Lechavalier, Paris, 1921.

CARR, J. W. *Claytonia perfoliata* in Nottinghamshire, in Naturalist 200-201, 1922.

CHAMBERLAIN, CHARLES J. The Big Tree of Tule, in Chicago School Science and Mathematics 21, 715, 1921. The species is *Taxodium mucronatum*, closely related to, if not a variety of, *T. distichum*. It stands in the churchyard of Tule, about 250 miles south-east of the City of Mexico. Twenty-eight people, with outstretched arms and with finger tips touching, can just reach round the trunk, which is said to be 50 feet in girth, but the measurements do not seem to tally. Its height is 150 feet. As is the case with the largest tree in the world, the Castagna di Cento Cavalli, on Etna—some writers think it is a group of trees, but Prof. Chamberlain examined the *Taxodium* with care and could find no evidence of such a theory. It is beautifully symmetrical and is a giant among its

kind. When he visited it in 1908 there was not a dead twig in sight and unlike *deciduum* it is evergreen. This, the Montezuma Cypress, was abundant in the Valley of Mexico when Columbus discovered America. At that time the City of Mexico was an American Venice, with canals for streets, and it was customary for rich Aztecs to have floating artificial islands with little cottages on them, which could be poled round on the neighbouring lakes; but the Spaniards drained the lakes and the big cypress trees disappeared. In the City of Mexico a single historic specimen, the Arbor del Noche triste, under which Cortez rested after his disastrous defeat, still stands protected by an iron fence. *T. mucronatum* is still found as comparatively small trees along the rivers. Prof. Chamberlain thinks the tree cannot be less than 5000 years old. "Some of the Californian Sequoias have reached an age of 4000 years, but the big tree of Tule is at least a thousand years older." It was seen by Humboldt on his journey, and on the east side of it is carved an inscription now partly overgrown. Resting under its shade, says Prof. Chamberlain, "and remembering its great age, one could hardly avoid thinking of events which have occurred during its lifetime. Before the Pyramids of Egypt were built it was a sturdy tree; before Moses led the children of Israel out of the wilderness it must have reached the usual size of the species; when Rome was founded it must have been known as a big tree; in the days of King Arthur and his Table Round, its reputation as a giant among its kind must have been established, and ever since there has been Mexican tradition, Indians have made pious pilgrimages to the Big Tree of Tule. It must have been a familiar object to the prehistoric men who built the Pyramids on the near-by Monte Alban, and who erected the wonderful buildings now known as the ruins of Mitla." This year one of the daily newspapers stated that the great Tree of Tule was beginning to show signs of wear and tear and will wither away before the present generation has passed. The height is given as 175 feet and the spread of its branches as 150 feet.

Under *Castanea sativa* mention will be made of the "Biggest Tree in the World," the Castagna, on Mount Etna, which I visited in 1906.

Chase, Corrie D. Co. Down Plants, in Irish Nat. xxxi., 95, 1922.

CHRISTY, MILLER. The Pollination of the British *Primula*, in Journ. Linn. Soc. xlvi., No. 306, 105, 1922. The insect-visitors of the three British species are enumerated. The whole paper evinces a thoroughness of work and a most judicious reticence in formulating a theory until it has been experimentally proved.

CHURCH, A. H. INTRODUCTION TO PLANT LIFE OF THE OXFORD DISTRICT. Bot. Memoirs, No. 13. Oxf. Univ. Press, pp. 103, 1922; 3/6. A brilliant and most interesting ecological study, full of valuable information and ilustrated with some beautiful photographic pictures of woodland and river vegetation. The chapter on geology is excellent reading. The estimate of the age of the world which satisfied the geologists of thirty years ago is now so much extended that 1000 millions are given without a qualm. The pre-glacial period may be estimated at a million of years ago. The Tertiary period has claimed for it 50-100 millions of years, but there are Families in the Cretaceous period, and the primary lines of divergence between Angiosperms and Gymosperms may be of Paleozoic antiquity, 300-400 millions. Forest timber trees were in existence in the Upper Devonian, " and this indicates the immensity of the gap still required to account for the rise of a timber tree, producing flowers and seeds from the algal prototypes of the transmigration and the positively hundreds of millions of years required to build the organisation of the arboreal habit from its constituent factors." Dr Church has no doubt about his theories. For instance, we are told that (1) every aquatic of the open stream once grew on the bank; (2) every bank-aquatic was once a plant of damp woodland undergrowth; (3) every plant of swamp-woodland was once in normal woodland as a herbaceous perennial; (4) every herbaceous perennial was once an underwood shrub; (5) every underwood shrub was once a tree of high-forest."

CLARK, J. EDMUND. Flowering Dates of Trees along Main British Railway Routes, in Nature 210, 1922. An important phenological paper. Members willing to afford assistance in these observations are requested to communicate with Dr J. Clark, Asgarth, Purley.

CLEMENTS, F. A. Aeration and Air Content. The Role of Oxygen in Root Activity. Carnegie Institute of Washington Publications, No. 315, 1921; 2 dollars.

COCKERELL, T. D. A., and YOUNG, DOROTHY. Mutation in *Aquilegia caerulea*—mutat. trifida, near the Smuggler Mine Wood, Colorado. See Nature 701, 1922.

COLTMAN-ROGERS, C. CONIFERS AND THEIR CHARACTERS. Demy 8vo. The Macmillan Co., New York; Murray, London, 1921; 21/-.

COMPTON, R. H. A Systematic Account of the Plants collected in New Caledonia and the Isle of Pines in 1914, in Journ. Linn. Soc., xlv., No. 304, 421, 1922. The Conifers number 31—an exceptionally large number for so small an area, three species being added by Prof. Compton to those previously recorded. *Podocarpus ferruginoides* is a new species. Two new genera are also described—*Austrotaxus*, with the species *A. spicata* and *Callitropsis*, with its species *araucarioides* Compton. He also collected 149 species of Ferns and 26 species of Vascular Cryptogams. *Cyathea neocaledonica*, *Lindsaya neocaledonica*, *Asplenium polyphyleticum*, *Eleophoglossum neocaledonicum*, *Gleichenia Montaguei*, *Lycopodium ignumbiense* are newly described species.

CRAIB, W. G. Contributions to the Flora of Siam, in Kew Bull. 225, 1922. Contains a large number of new species.

CURTIS'S BOTANICAL MAGAZINE. Founded in 1787. Edited by O. Stapf, Ph.D. Vol. cxlviii., 48 coloured plates. Annual Subscription, £3 3s. H. F. & G. Witherby, 326 High Holborn, London, W.C., from whom vols. 71 to 147 are obtainable. It is good news to see that this valuable magazine is once again appearing.

DAHLGREN, K. V. OSSIAN. Om *Lysimachia Nummularia* i Sverige. Bot. Notiser, hft. 3, 129-137, 1922.

DALLMAN, A. A., F.C.S. The First Liverpool Flora and its Author in the Lancashire and Cheshire Naturalist, vol. xiv., p. 244, 1922. This alludes to T. Hall, the author of A Flora of Liverpool, published in 1839. In the preceding year Hall was elected a member of our forerunner, the Botanical Society of London, of which he became local secretary. His address is there given as of Coggeshall, Essex. This paper is an excellent treatment of the subject and a valuable contribution to botanical bibliography.

DARWIN, FRANCIS, and SHRUBS, A. Records of Autumnal or Second Flowering of Plants, in New Phytologist xxi., 78, 1922.

DAVY, J. BURTT. Revision of the South African Species of *Dianthus*. Seventeen species and three varieties are described in a useful clavis. Six new species described by the author are included in that number. One, *D. mooiensis*, was described by Mr F. N. Williams. See Journ. Linn. Soc., June 1922.

DENT, Mrs R. W. THE WILD FLOWER MAGAZINE for 1922, edited by Mrs Dent, is a pleasing publication of an extremely popular Society which acts as a feeder to more advanced work. The February-March number contains a picture of the charming silver rose-bowl which was presented by the members to Mrs R. W. Dent, O.B.E., on the occasion of the 25th anniversary of the Magaine. The report of the work for 1921 shows how industrious the members are. That for the Juniors, under our member, Miss Honor M. M. Pennycoste. includes some distinct rarities. One, however, it is to be feared, is a misnomer—*Tordylium maximum* from Suffolk. Dr Claye's branch C. Juniors are quite good, one of the competitors finding 467 species. The branches presided over by Miss Saunders and Miss Hall have also done well. In this competition 730 plants were found by Miss Richards. Miss Gertrude Bacon gives as a chapter "A Word in Season," which might be read with advantage by many botanists. Miss Robinson, of Sussex, says both her parents remember the appearance of *Veronica Buxbaumii* in England. In the April number Mrs Dent gives an account of a Channel Island visit. Miss Richards, one of our members, reports on Branch A and Mr T. H. Green on Branch J, in which Miss Carmichael has a wonderful collection but, I am afraid, it has misnomers. I should like to see *Carex alpina* and *Pinguicula alpina* (the latter, if correct, would be a most important discovery as the Black Isle, alas, knows it no more). Miss H. H. M. Pennycoste gives an account of the Botany of Par, and the Rev. S. Laing a paper on British Orchids. The June number contains an editorial written from Oxford by Mrs Dent. Miss Hilda Salmon reports on Branch I., Seniors, in which it states our member, Mr R. H. Williamson, found 848 species in the year. The Hon. Mrs Campbell saw *Ononis reclinata* in Devon and Miss Lyon *Asplenium viride* in Sussex. In the August number there

is a capital report on Branch Q by Mrs Sandwith, which contains excellent advice. Miss Mason records *Urtica pilulifera* from Norfolk in a new locality. One would much like to see a specimen. Mrs Eyre records *Epilobium alpinum* from Merioneth but it cannot be accepted until a specimen is produced. Miss Thompson's record of *Potentilla fruticosa* from Scotland must await further information. The October number gives notes on the Cumberland Flora by Mrs Dent. *Phleum alpinum*, sent by Miss Scott from Bucks, must be a misnomer. Miss Hillard reports on Branch R. Mr J. Parkin has a paper on the "Lesser Celandine Counts." From the members he received 5224 counts. The general results show that at the height of the flowering season 70 to 80 per cent. of the flowers have eight petals and 98 per cent. three sepals and that the next most frequent number for the petals is nine.

Dixon, Prof. H. H. Practical Plant Biology. A Course of Elementary Lectures on the General Morphology and Physiology of Plants, pp. xi., 291. Longmans, Green & Co., London, 1922; 6/-.

Emerson, F. W. Subterranean organs of Bog Plants, in Bot. Gaz. 359-374, 1921.

Fairchild, David. Inventory of Seeds and Plants imported [into the U.S.] from December 31, 1916, to December 31, 1919 (Nos. 43,391-49,123), and September 21, 1921, to July 1922. U.S.A. Dept. of Agric., Washington. In this wonderful output nearly 5000 separate introductions are tersely noted, chiefly consisting of seeds and plants of economic or horticultural value. Not only are these Inventories most useful when issued but they afford a trustworthy historical record of the date of introduction of plants, some of which may be of the greatest value. The introduction to each number forms an excellent précis. In one (No. 59) it states that *Chenopodium album* is used by many people in the States and is said to be more delicate than Spinach. So *Amaranthus paniculatus* (No. 56) yields a seed which was cultivated by the Aztecs before the discovery of America. Montezuma had 167,000 bushels of its seeds in his granaries. In No. 58 Mr Fairchild says "as the years have passed . . . the proportion of new plants which appears interesting seems to have increased. . . . This is quite the opposite of the prediction of my friends who raised the question in the beginning as to

what I proposed to do when all the plants which were worth while had been introduced. Instead of the widening prospect that actually lies before us and which embarrasses with its wealth of opportunity, they saw in their imagination the stream of new plants becoming a tiny brook and finally stopping altogether. It is interesting to note that, whereas in the spring quarter of 1913 there were 407 introductions, six years later, 1919, there were practically as many, 397, and this in the face of the world war, which had demoralised shipping. The dearth is not in plant material of great potential possibilities, but in experimenters who can adapt these plants to the wide uses of mankind. Ten thousand independent experimenters scattered over this country could spend their lives working on the material we have brought in and not exhaust its possibilities." Again in No. 59 he says, " The agriculture of America in the next century will diverge widely from what it is to-day, just as to-day it is something vastly different from its conditions when the Indians hunted over the country. Even now it will be found that the Date oases of California and Arizona, the Durum-wheat areas of the Great Plains region, the feterila-sorghum areas, and the Sudan grass-fields of the West, the Dasheen patches of the South, the Zante-currant vineyards of California, the Timber-bamboo groves of Louisiana, the Rice-fields of California and Texas, if their history is traced, had their beginnings in part or wholly in these inventories." The remark about the falsification of prediction as to the drying up of the stream of introductions has its parallel in Britain where many people in the seventies thought the botany of Britain had been completely exhausted. Yet in the 50 years which have elapsed probably more species have been added to the flora than in any other similar period. And the paragraphs also bear upon the criticism which has been made as to the uselessness of making notes of the occurrences of alien species in Britain. Information is surely needed as to when these adventives came in. The mass, it is true, are ephemeral, but a few have come to stay, and one cannot predict which they may be. Nor can a sharp line of separation be drawn. Some of the more intensive critics would apparently reject rubbish-heap casuals, but would admit escapes from flower-beds in a cemetery! Others would omit reference to *Sisymbrium orientale* but notice *Salix babylonica* or the Larch.

FAWCETT, WILLIAM. Note on William Wright, a Jamaican Botanist, in Journ. Bot. 330, 1922.

FERNALD, M. L. The North-American Representatives of *Scirpus caespitosus*, in Rhodora xxii., 25, 1921. Two varieties, *callosus* Bigelow, and nov. var. *delicatulus* are given. The generic name, *Phragmites*, *l.c.*, xxiv., 55, 1922.

FERNALD, M. L., and WEATHERBY, C. A. *Equisetum fluviatile* or *limosum*?, in Rhodora xxiii., 43, 1921. The authors claim the name *limosum* for the type as we do in Britain. In America, as in Britain, there is no strict limitation of the species and variety.

FRIES, S. C. E. Die Skandinavischen Formen der *Euphrasia salisburgensis*, in Arkiv. för Botanik, xvii. No. 6, 1922.

FRITSCH, K. EXKURSIONS FLORA FUR OSTERREICH. pp. lxxx., 824. Wien, C. Gerold, 1922. Est *Cardamine bulbifera* als Abkömmling Eines Bastardes Aufzufassen. Berichte der Deutsch. Bot. Ges. 193, 1922.

FUCHS, ALFRED. *Orchis Traunsteineri* Saut., in Ber. Naturw. Vereines Schwaben and Neuberg, xlii., pp. 3, 174, t. 47, 1919. *O. pseudo-Traunsteineri* is described as new with several new subspecies.

FYSON, Prof. P. F. THE FLORA OF THE NILGIRI AND PULNEY HILL-TOPS. Vol. 3, pp. xviii., 581. Madras Government Press, 1920; 15 r. 6 a.

GAMBLE, J. S., M.A., C.I.E., F.R.S. A MANUAL OF INDIAN TIMBERS. An Account of the Growth, Distribution, and Uses of the Trees and Shrubs of India and Ceylon with Descriptions of their Wood-structures. Reprint of Second Edition with Corrections and Additions, pp. xxiii., 868, including a map, 16 plates of sections of Indian Timbers, and four full page illustrations, *i.e.* Forest of Long-leaved Pine, A Sál Forest in the Dehra Dún, Young Teak Trees, and Clump of Thorny Bamboo. Sampson, Low, Marston & Co., London, 1922; three guineas. Although the subject-matter of this

very important work lies outside the sphere of British botany, one is unable to refrain from directing the attention of our readers to it. The investigations of Mr Gamble into the floristic botany of India have been of a very high order of merit, and science is the debtor to him for the results of his manifold labours in, among others, the excellent *Flora of the Presidency of Madras* (see *Rep. B.E.C.* 336, 1921). In this more technical work he has laid the Indian Government itself under great obligations for bringing into such a compact and attractive form an enormous mass of information of the highest economic value. Let us take an example. "One of the most magnificent trees in the world is splendidly figured by Fitch in Hooker and Cathcart's *Illustrations of Himalayan Plants* [of which Dr Thompson's copy, through the kindness of his niece, is in the possession of the writer]. It has large flowers of a glorious rose-red colour, and attains a height of 150 feet. A specimen in full blossom is, as Hooker told me, an astounding sight. The tree is *Magnolia Campbellii* Hook. f. & Thompson Fl. Brit. Ind. i., 41; Hook. f. Ill. Him. Pl., tt. 4 and 5; Gamble Darj. List 2; King Ann. Calc. iii., 208. Red Magnolia. Vernacular Lal Champ *Nep.*; Sigumgrip, sagok, penre, *Lepcha*; Pendder, patagari, *Bhutaia.*" Then follows the description. The tree is found in "Sikkim and Bhutan Himalaya at 8-10,000 feet. It used to be very common, and King says that specimens 150 feet high were common in the time of Sir Joseph Hooker's visit in 1849, but the demand for building and tea-box woods has made large trees scarce. . . . The wood is used for planking chiefly. Growth moderate, 11½ rings per inch of radius E. 365. Rangirum Forest, Darjeeling, 7500 ft. (Johnston). 25 lbs.." The last figures refer to the weight of a cubic foot of the wood. In the case of a tree of considerable economic value full particulars are given of its qualities, of its insect pests, and the methods of cultivation. For instance, under the Sandal Wood, *Santalum album*, there are two closely printed pages devoted to it. It yields a heavy timber, as much as 60 pounds in a cubic foot. A large quantity is exported to China for coffins. It affords a valuable essential oil which is best obtained from trees growing at 2-3000 feet altitude. The arrangement follows that of Hooker's *Flora of British India*, and under each family is given the timber-yielding species. There are excellent indices—(1) of European; (2) of Scientific; (3)

of Vernacular names; and (4) of Numbers of Wood Specimens, the latter alone occupying eight pages. There is a good map from Afghanistan and Kukunor southwards including Ceylon and the Nikobar Islands. The work is indispensable to Schools of Forestry and is a most useful book of reference to any who are interested in Indian Botany or Arboriculture. This is shown by the demand which has arisen for this reprint. The introduction is a masterpiece of compression, and the details of the microscopic sections in the plates are well brought out. It may be added that even in 1902 the number of woody plants in India totalled 5000—a third of its then known flora. In this work about 1500 have their wood described, but this includes some exotic trees.

GEISENHEYNER, L. Zwei Rassen von *Dianthus caesius* Sm., in Verhandl. des Bot. Ver. der Prov. Brandenburg, 34-37, 1920-21 [1922].

GILBERT-CARTER, HUMPHREY. GUIDE TO THE UNIVERSITY BOTANIC GARDEN OF CAMBRIDGE. pp. xvi., 117, with 23 illustrations. Cambridge University Press, 1922; 3/6. In this pleasing and compact volume, a considerable amount of useful botanical information is supplied about the plants cultivated in the Garden, which through the liberality of Dr Walker, the Vice-Master of Trinity College, was founded in 1762. The Garden of about six acres, by an Act of Parliament, was allowed to be moved to the present site in 1831. The very fine specimen of *Sophora japonica*, near the Pathological Laboratory, marks the original site. The old gateway has been removed and a good illustration shows it at the main entrance of the present Gardens, which, as visitors know, are well arranged and kept in a manner worthy of the University. Under the excellent management of Mr Lynch they held a very varied and rich collection, which it was always a pleasure to visit, and one is glad to see under the altered arrangements that the high standard is likely to be maintained. Following the unfortunate (as some of us think) method of the *Cambridge Flora* all the trivials are spelled with a small letter, and the arrangement of the species is that of Engler. In the introduction it states that "the Law of Priority rules the question of Botanical Nomenclature and that the Law of Aptness holds no sway . . . in practice it is the only legislation possible."

However, under *Welwitschia*, the older generic name *Tumboa* is only quoted in synonymy while the oldest trivial *Bainesii* (inapt as it may be) is cited only, *Tumboa bainesii*, but it has been joined to *Welwitchia* as *W. Bainesii* by Carr. A specimen grown from a seed collected by the late Professor Pearson is in one of the houses. A great many valuable economic notes are tersely added, and a novel feature is the citation of many Indian names which are written in Urdu characters. A useful plan of the Gardens is added, and no visitor to the Gardens should go unprovided with this very useful help.

GODFERY, Colonel M. J. The Fertilisation of *Cephalanthera*, in Journ. Linn. Soc. xlv., n. 304, p. 511, 1922. The writer holds, in contradiction to Darwin, that *Cephalanthera* is a very ancient genus and that it is not a degraded *Epipactis*. It shows the earliest method of cross-pollination in the family before a rostellum had yet been evolved. He holds that the genus was well established before *Helleborine* (or, as he calls it, *Epipactis*) came into being. Darwin operated with *C. Damasonium* (*grandifolia*). Had he examined, says Colonel Godfery, *C. rubra* or *longifolia* (which he calls *ensifolia*) he would have assuredly discovered their simple method of cross-pollination and that they are dependent upon insect visitors. He holds that the self-fertilisation of *C. Damasonium* has been developed owing to the scarcity of insects in the shady woods where it grows but that it is an addition to not a replacement of cross-pollination. Notes on Fertilisation of Orchids, in Journ. Bot. 359, 1922.

GRIFFITHS, B. MILLARD. The Heleoplankton of Three Berkshire Pools, in Journ. Linn. Soc. xlv., n. 305, 1922. These pools are at Bulmershe and White Knights.

GROVES, JAMES. On Charophyta collected by Mr T. Bates Blow in Ceylon, in Journ. Linn. Soc. 97, 1922. Our old member, Mr Blow, has collected in many parts of the world and a paper on the Charas collected by him in the West Indies has already appeared (*Journ. Bot.* 323, 1898). Mr Blow's specimens are always well prepared and this gathering is the most extensive yet made for the 'spicy isle of Cinghali,' thirteen species being enumerated in the present article. One is a new species,

Nitella leptodactyla Groves, of which a figure is given. It is not unlike our own *gracilis*. It was obtained from Moratuwa between Colombo and Galle. *Nitella mucosa* is now made a species. Nordstedt treated it as a form of *pseudo-flabellata*.

GUIGNARD, L. LE JARDIN BOTANIQUE DE LA FACULTE DE PHARMACIE DE PARIS. pp. 180. Marqueste, Toulouse, 1922; 8 frs.

GUNTHER, R. T., M.A. EARLY BRITISH BOTANISTS AND THEIR GARDENS. pp. viii., 417. Clarendon Press, Oxford, 1922. Based upon unpublished writings of Goodyer, Tradescant, and others. An account of Goodyer, his work at British Botany, and a list of his books which he left to Magdalen College Library are in *Rep. B.E.C.* 523-50, 1915, of which it formed a supplement. No copy for review has been received.

GUSTAFSSON, C. E. Nogra ord om Rubusformernas systematik, in Bot. Notiser, heft 4, 190-196, 1922. *Rubus Scheutzii* Lindeb. och *Rubus thyrsanthus* F., in Bot. Notiser, heft 3, 155-158, 1922.

GUERSTLAUER, L. Kritische Potentillen im südwestlichen Bayern, in Bericht. der Bay. Bot. Gesell. xvii., 1-17, 1922.

GWYNNE-VAUGHAN, Dame HELEN. FUNGI. Ascomycetes, Ustilaginales, Uredinales. 8vo., pp. xii., 232, 196 text-figures. Cambridge University Press, 1922; 35/-.

HAAS, PAUL, D.Sc., and HILL, T. G., A.R.C.S. AN INTRODUCTION TO THE CHEMISTRY OF PLANT PRODUCTS. Vol. II. Metabolic Processes. With diagrams, pp. 140. Longmans, Green & Co., London, 1922; 7/6. The first volume dealt with the nature and significance of the commoner organic compounds of plants; in this volume, dealing with Metabolism, the authors give an outline which forms a basis for the study of the processes. The authors instead of giving as full an account as possible of the literature have chosen the more difficult task. The work is arranged under the heads of the Living Plant, the Hydrogen Ion Concentration, the Synthesis of Fats, Carbohydrates, Proteins, Respiration and Growth. The book is necessarily highly technical and is outside the sphere of study by

field botanists, but to the physiological student, from the high reputation of its authors, it must strongly appeal, and will prove of great service. The much discussed vitamins of which three are at present recognised are—A, fat soluble; B, water soluble; and C, which may or may not be identical with one of the other two. A is the growth promoting or anti-rachitic, B the anti-neuritic or anti-beri-beri vitamin, and C, for convenience, is termed the anti-scorbutic vitamin. They appear to be produced only in the vegetable world—no animal is able independently to produce vitamins for its own use. A is associated with fats or oils especially in fish-livers, *i.e.*, cod liver oil, but the vitamin is said to be obtained from the Algae and other plants devoured by fish. Vegetable oils strangely contain a low content of vitamin A. Vitamin B is associated with the pericarp of rice and other grain hence the importance of not carrying the milling process of cereals too far. Vitamin C is associated especially with growing plants and is not contained in the seed as such, but the germinating seed is an effective anti-scorbutic. The knowledge of the subject is, however, embryonic and it is not at all certain whether either of the two hypotheses as to their constitution is correct, *i.e.*, Williams says they are related to hydroxypyridine and contain a betaine ring, while Bessanoff affirms they are polyphenolic substances related to hydroquinone—either sufficiently alarming in name to a nervous invalid who has to swallow them.

HAMPDEN, MARY. BULB GARDENING, 7/6; ROSE GARDENING, 7/6; TOWN GARDENING, 6/-. Thornton, Butterworth, Ltd., 1921.

HEDEREN, BIRGEN. *Anemone Hepatica* L. in Transtrand, Dalarne, in Svensk Bot. Tids., xvi., 302, 1922.

HEGI, G. Illustrierte Flora von Mittel-Europe. Lehmann, München, 1922.

HENRIKSSON, J. *Anemone nemorosa* L., var. *marginata*, nov. var., in Bot. Notiser, heft 2, pp. 103-104, 1922.

HILEY, W. E., B.Sc. OXFORD FORESTRY MEMOIRS. An investigation into the height and growth of trees and meteorological conditions. Clarendon Press, Oxford.

HITCHCOCK, A. S. The Type Concept in Botany, in American Journ. Bot. vii., 251, 1921.

HOFFMANN, R. Flora of Berkshire Co., Mass., in Proc. of the Boston Soc. of Natural History 171-382, 1921.

HOOKER, Sir J. D. 201 letters to Sir W. T. Thistleton-Dyer, 1870-1909, who has kindly presented them to the Library at Kew Gardens. Lady Hooker has also presented 37 original notebooks of his Indian and other travels as well as other material. W. B. Hemsley has also presented his letters from Sir J. D. Hooker.

HOLM, T. CONTRIBUTIONS TO THE MORPHOLOGY, SYNONYMY, AND GEOGRAPHICAL DISTRIBUTION OF ARCTIC PLANTS. Rep. of the Canadian Arctic Exped., 1913-8. Vol. 5, Botany, pp. 139. F. A. Acland, Ottawa.

HOWARTH, O. J. R. The British Association for the Advancement of Science: A Retrospect, 1841-1921, pp. vii., 318. Brit. Ass., Burlington House, London, 1922; 7/6. The Association was founded by Sir David Brewster in 1831. Its first meeting was held at York, the second at Oxford, the third at Cambridge. The Association has expended in grants since 1834 about £83,000, of which the Botany, section K., has received the modest amount of £1952.

HUGHES, Miss D. K. Further notes on the Australian Species of *Stipa*, in Kew Bull. 15, 1922. The Australian species now number 42 and six are at present dubious. Two new ones *bigeniculata* and *effusa* are included in this paper. Serrato-ciliata group of *Tropæolum*, in Kew Bull. 63, 1922, with key to species.

HURST, CECIL P. East Wiltshire Lichens, in The Wiltshire Magazine, vol. 42, pp. 1-16. This gives a list of 85 lichens observed during the last three years, the most important of which is *Bilimbia Naegelii*.

IKENO, S. On Hybridization of some Species of *Salix*, in Ann. of Bot. 175-191, 1922.

JEDIN, OLOF. Zur Blüten und Befruchtungsbiologie der Leindotter (*Camelina sativa*), in Bot. Notiser, heft. 4, 177-189, 1922.

JOHANSSON, W. K. Ulmus-studier pa Oland, in Bot. Notiser, heft 4, 197-202, 1922.

JOHNSTON, Col. H.-H. ADDITIONS TO THE FLORA OF ORKNEY, as recorded in Watson's "Topographical Botany," second edition (1883), in Trans. Bot. Soc. Edin., vol., xxviii., pt. 2, p. 52, published December 21. This does not mean that they are additions to the known flora, but only additions to Top. Bot., since many have been already recorded, some in our own pages.

KEMPTON, J. H. Inheritance of Ramose Inflorescence in Maize, with photographs, in U.S.A. Bull., 971, Dept. of Agric.

KLOOS, A. W. Aanwinsten van de Nederlandsche Flora in 1920, in Ned. Kruid K. Arch. Jaerg. 1921, gives many adventives from Holland, including a new *Oenothera*, *i.e.*, *argentinae* Lév. et Thell., allied to *O. laciniata* Hill.

KNOCHE, H. FLORA BALEARICA: Etude Phytogeographique sur les Iles Baleares, 534, 1921.

KNUDSON, L. Nonsymbiotic Germination of Orchid Seeds, in Bot. Gaz., 1-25, 1922.

LACAITA, C. Addenda et emendanda ad Floram Italicam, in Bull. Bot. Soc. Ital., 18, 1921.

LANG, Prof. W. H. TRANSLATION OF STRASBURGER'S TEXT-BOOK OF BOTANY. Fifth English Edition, pp. xi., 799. Macmillan & Co., London, 1921; 31/6.

LANKESTER, C. H. A Short Trip on Mt. Elgon, Uganda, in Kew Bull. 145, 1922.

LARTER, Miss C. E. Thirteenth Report of the Botany Committee, in Trans. Devon. Assoc. 89-97, 1921.

LAW, ERNEST C. B. SHAKESPEARE'S GARDEN, pp. 34, tt. 21. Selwyn & Blount, London, 1922. The beautiful illustrations in the book will appeal to those who become its possessor. The author

pleasantly shows how the improvements at Stratford have come about and how beautiful the Knott Garden and the Long Border have been made by those who took up the work as a labour of love. Shakespeare lovers in many parts of Britain have contributed to this happy result. Among others, Marie Corelli gave fifty pounds when the funds were low. The idea is a charming one. May it be copied in many places where at present a town space is hideous for want of a little care and forethought. There are many references to Shakespeare's flowers in this little volume. The author need not have run such a tilt against Latin names, uncouth as they are, since grosser names have been given them in English literature as Shakespeare well knew, and even the Long Purples of Warwickshire might have an entirely different meaning in another part of England. Nor is an English name like Marigold always pronounced in one way any more than *Reseda*.

LEDENGREN, G. R. Anteckningar till Sveriges Adventis-flora, II.

LEROUX, E. OSIERCULTURE. pp. 352. J. B. Baillière et Fils, Paris; 10 francs.

LITTLE, J. E. Notes on North Herts Willows, in Journ. Bot. 79, 1922.

MATHIESEN, FR. J. SCROPHULARIACEAE. The Structure and Biology of Arctic Flowering Plants. Meddel om Gronland 361-507, tt. 46, 1921.

MATTHEWS, J. L., M.A. The Distribution of Plants in Perthshire in Relation to Age and Area, in Ann. Bot. xxiv., 321, 1922. The principle worked out by Willis from the study of numerous floras "that *on the average* the older a species is within a given country the greater area it will occupy" is one which is now generally accepted. The effects of man's occupation are one of the modifying factors emphasised by Willis. The writer has compared the flora of Perthshire on these lines and finds it agrees perfectly with the general aspects of the theory advanced in "Age and Area" — the widely distributed species in Perthshire prove to be common species in Britain. In both the rarity is 2-2,

and 502 species out of a total of 738 exhibit a remarkably striking descending series quite comparable with the ' Wides ' of Willis. But Perthshire possesses 103 rare, entirely Lowland, species, as many as 40 of these being limited to a single district. The numbers run in an opposite direction to the ' Wides.' Since these species are not endemics, their great variety cannot be due to recent origin, but on Willis' theory to recent arrival within the county. They are confined very largely to Gowrie and Lowland Earn, where the bulk of the Perthshire flora seems to have entered, and they are thus possibly at an early stage of invasion. It would be necessary to see this long list of species before assent could be given as to their recent arrival. The Highland element is excluded from the application of the same law. Matthews says it has been estimated that 13,000 years have elasped since the emergence of Scotland and Scandinavia from the ice cap of the last glacial period. Since then an Arctic flora has almost entirely disappeared. Numerous species once occurring in Britain are now extinct. Those that remain are confined to our higher hills . . . and must be regarded as relics of an outgoing flora. Are *Oxytropis campestris*, *Carex polygama*, *Carex salina*, and *Deyeuxia* to be taken as ' relics ' or ' arrivals '?

MENDEL, GREGOR. The Centenary of the Abbot Mendel took place on September 22, 23 and 24 of this year at Brunn, in Czecho-Slovakia.

MERRILL, E. D. A BIBLIOGRAPHICAL ENUMERATION OF BORNEAN PLANTS. Journ. Straits Royal Asiatic Society, 637, 1921, London, W. Wesley; 8 dollars 50 cents. A review of the new species of plants proposed by N. L. Burman in his Flora Indica, in Philipp. Journ. Sc. 329-388, 1921.

MURR, Prof. Dr JOHN. GESCHICHTE DER BOTANISCHEN ERFORSCHUNG LIECHTENSTEINS, pp. 80, 1922.

NATIONAL TRUST. Report for 1921-2 gives particulars of the property recently acquired. It includes 70 additional acres at Box Hill through the generosity of Miss A. B. Warburg. Mr Emery Walker has presented some land near Eashing Bridge. An extra portion of land bordering Derwentwater has also been purchased so

as materially to improve the beauty of the Memorial to Canon Rawnsley. The picturesque ruin of Lyveden New Build in Northamptonshire has also been obtained.

NUTTALL, G. C. BEAUTIFUL FLOWERING SHRUBS. pp. 291. Cassell & Co., London; 21/-.

OSTENFELD, C. H., and PAULSEN, OVE. [Plants of] SOUTHERN TIBET. Discoveries in Former Times compared with my own Researches in 106-8, by Sven Hedin, pp. 27-100, tt. viii. These plants, numbering about 260, were collected in the Pamir, Tibet, and East Turkestan. The new species incude *Chondrilla polydichotoma* Ostf., *Saussurea humilis* Ostf., *Aster Hedinii* Ostf., *Artemisia Hedinii* Ostf., *Pedicularis Svenhedinii* O. Pauls., *Acantholimon Hedinii* Ostf., *Pleurospermum Hedinii* Diels, *Myricaria Hedinii* O. Pauls., *Euphorbia altobetica* O. Pauls., *Astragalus toatjenensis* and *Hedinii* Ulbrich, *Oxytropis thionantha*, and *Hedinii* Ulbrich, *Glycyrrhiza Hediniana* Harms., *Sedum dubium* O. Pauls., *S. stamineum* O. Pauls., *Delphinium candelabrum* Ostf., *Polygonum peregrinatoris* O. Pauls., *Calamagrostis Hedinii* Pilger and *Potamogeton tubulatus* Hagstr. One new genus, *Hedinia* Ostf., allied to *Hutchinsia* and *Capsella*, is established by Dr Ostenfeld.

PEARSALL, W. H. The Development of Vegetation in the English Lakes considered in relation to the General Evolution of Glacier Lakes and Rock Basins, in Proc. Roy. Soc., Biol. Sect., ser. B. 259-284, 1921. Plant Distribution and Basic Ratios, in Naturalist 269-271, 1922.

PEARSALL, W. H., and MASON, F. A. Yorkshire Naturalists at Thornton Dale, in Naturalist [List of Plants] 289-296, 1922. Yorkshire Naturalists at Filey, in Naturalist [List of Plants] 317-320, 1922.

PETCH, T. *Statice Limonium*, on the north bank of the Humber, in Naturalist 9-12, 93-96, 121-124, Addendum 155-156, 1922.

PIPER, C. V. Important Cultivated Grasses, U.S.A. Dept. of Agriculture, Farmers' Bulletin, n. 1254, Washington, 1922. This is a most valuable and practical paper. We copy what the writer

says about the study of Grasses: "It is not necessary to have any elaborate instruments for examining them or to acquire a detailed knowledge of their structure. Nearly every grass is so distinctive that once a person has noted its obvious characteristics he will easily recognise it again. Though there are probably about 6000 distinct species of grasses in the world only about 60 are important cultivated plants, and not more than 20 wild species are abundant or valuable in any one locality." Some excellent figures of the details of the inflorescence are given.

PIPER, C. V., and DUNN, S. T. Revision of *Canavalia*, in Kew Bull. 129, 1922, with key to the old-world species. Dunn describes three, and Piper two new species.

POLE, EVANS I. B. THE FLOWERING PLANTS OF SOUTH AFRICA. Vol. i., cr. 4to, tt. 40. L. Reeve & Co., 1921; £3 6s.

PORSILD, THORBJORN. Griffelhaarene hos *Dryas octopetala* L., og *Dr. integrifolia* Vahl (the pubescence of the styles in *Dryas octopetala* L. and *D. integrifolia* Vahl), in Bot. Tidsskrift, bd. 37, heft 2, pp. 121-4, 1920.

PRAEGER, R. LLOYD. *Equisetum litorale* Kuehl., in Irish Nat. xxx., 145, 1921.

PRAIN, Sir DAVID. A warmly-worded address, together with some parting gifts, was given to Sir David on his retiral by the staff at Kew. His tenure of the office was a brilliant one and he carries with him into retirement not only the good wishes of his staff but of all those botanists with whom he has been brought into contact.

REA, CARLETON. BRITISH BASIDIOMYCETAE. A Handbook to the Larger British Fungi. Published under the auspices of the British Mycological Society. pp. xii., 799. Cambridge University Press, 1922; 30/-. In this model of conciseness, our member has produced a text-book which must prove invaluable to the study of the larger Fungi. His thirty years' experience in the investigation of this group is of a very thorough nature and has commanded the respect of our leading fungologists. That the Royal Society contributed to

its preparation is an evidence of the authoritative standard of the work. A key to the divisions and genera is given. The specific descriptions are clear and concise, and the original authority for the species, when differing from the one adopted, is given, *e.g.*, *Caloceras tuberosa* (Sow.) Fries, with a reference to Sowerby's figure. The derivation of the generic name is supplied, *i.e.*, kalos = beautiful, keras = a horn. A copious bibliography is supplied occupying eight pages. The specific names are arranged in the index alphabetically, the generic name following, *i.e.*, *clavatus* (Batt.) Quél. (*Coprinus.*) Synonyms are printed in italics. This saves much trouble when looking for the species. It may be added that Cook's illustrations are cited throughout. The author must be most warmly congratulated on his completing so important an addition to our British text-books, which will doubtless for many years be the hand-book of every student of this varied and difficult group.

PRATT, A. WILD FLOWERS. 2 vols., cr. 8vo, pp. 196, 231. S.P.C.K., London, 1922; 10/-.

PRIESTLEY, J. H., and HINCHCLIFF, MILDRED. The Physiological Anatomy of the Vascular Plants characteristic of Peat, in Naturalist 263-268, 1922.

PUGSLEY, H. W. Notes on British Euphrasia, in Journ. Bot. 1, 1922. He gives a new form—f. *albida* of *E. confusa*. He doubts if *E. stricta* has been found in Britain.

RAYNER, J. F. The Botany of the Southampton District, in Trans. S. E. Union of Scientific Societies, pp. 43, 1922. This is a useful account of the plants of the area and includes several which are new county records. There are a large number of adventives. One of these, *Crepis mollis*, is, and it is the first time I have seen it, recorded in that grade. *Solanum maritimum* is an addition to the British list. The *Euphorbia Esula*, however, proves to be the commoner *E. virgata*.

RIDLEY, H. N., F.R.S. THE FLORA OF THE MALAY PENINSULA. Vol. I., Polypetalae. pp. xxxv., 918, 1922. L. Reeve & Co., London; £3 3s. *Rigiolepis* and other Vacciniaceae of Borneo. Four new species are described.

ROBINSON, J. FRASER. *Cephalanthera Damasonium* Druce = *C. grandiflora* Gray, *C. pallens* Rich., etc. Near Brough, E. Yorks. See *Naturalist* 22, 1922.

ROBSON, F. OUR WAYSIDE TREES AND HOW TO KNOW THEM. Thornton, Butterworth, 1921; 6/-.

ROCK, JOSEPH F. The Chaulmoogra Tree (*Taraktogenos Kurzii* King) and Some Related Species: A Survey conducted in Siam, Burma, Assam, and Bengal, in United States Dept. of Agric., Bulletin n. 1057, April 1922. The use of Chaulmoogra Oil in leprosy, one may say the successful use, is the justification for this excellent research into the vegetable origin of, and the distribution of the plants yielding, a fatty oil, not a volatile oil. The isolation of Chaulmoogric and Hydnocarpic acids was made by my friend, Dr F. R. Power, in London, and he, with his collaborators, prepared their respective esters. Several photographs of the trees growing in Burma are added. The tree is a slender, smooth-barked species, with pendulous branching habit, about 50 feet in height, with fruits about the size of a large orange of a light fawn colour and velvety tomentose. The collection of the fruit is difficult on account of the number of tigers which infest the jungle. Mr Rock with thirty coolies was followed for a whole day in broad daylight in this district by a tiger which during the following night killed three women and a two-year-old child.

ROHDE, ELEANOR SINCLAIR. THE OLD ENGLISH HERBALS. pp. viii., 243, with coloured frontispiece and 17 illustrations. Longmans, Green & Co., London, 1922; 21/-. This handsome volume deals with that attractive and curiously neglected branch of garden literature, the Old English Herbals from Anglo Saxon times to the end of the seventeenth century. The chapter on early MS. herbals treats of Anglo-Saxon plant-lore and folk-medicine of which these MSS. are the sole source. A chapter is devoted to herbals written in connection with the colonisation of America by the Spaniards and English. This chapter contains information concerning the first records of Red-Indian plant lore, English weeds introduced into America with the first colonists and early lists of plants in New England gardens. For some years our members, Dr and Mrs

Charles Singer, have studied with great detail the MSS. of Anglo-Saxon Herbals and the authoress is indebted to them for reading the proof-sheets on this subject. The earlier MSS. perished, perhaps at the hands of the Danes, but Herbals existed as early as the eighth century since (as is quoted) Boniface, the Apostle of the Saxons, received letters from England asking him for books on simples and complaining that it was difficult to obtain the foreign herbs mentioned in those we already possessed. The earliest which exist, says the authoress, dating from the tenth century, are The Leech Book of Bald, once in Glastonbury Abbey, which in date precedes the books of the Salernian School, the Lachnunga, the Saxon Translations of the Herbarium of Apulius, and the so-called Περὶ Διδαξέων (Peri Didaxeon) which exists as a Saxon translation in the Harleian MSS. in a thin, badly mutilated, volume which shows that it is in part indebted to writers of the Salernian School. As the writer cogently says "the two latter are less interesting because they are translations, but the more one studies the original Saxon writings on herbs and their uses, the more one realises that . . . . there are suggestions and traces of an age far older . . . . and embedded beliefs which carry us back to the dawn of history. It is this which gives this plant-lore its supreme interest."

The oldest herbal known in Britain is the one in the British Museum called "The Leech Book of Bald," evidently the manual of a Saxon doctor, which dates from A.D. 900-950. It was penned on vellum by Cild the scribe and to-day exists in excellent preservation. It consists of 109 leaves of vellum on which, probably shortly after the death of Alfred, is written in a large bold hand the vernacular text which here and there has a faintly illuminated initial letter. It was written, so Mrs Rohde says, under the direction of Bald who, if not a personal friend, had access to King Alfred's correspondence, for one chapter of the Leech Book consists of prescriptions of drugs such as a resident in Syria would recommend. These had been sent by Helias, the Patriarch of Jerusalem, to Alfred, whom we may perhaps claim as an early botanist, since Bishop Asser tells us that he kept a book in which the King entered "little flowers culled on every side from all sorts of masters," unless indeed this referred to flowers of speech. One of the prescriptions sent by the Patriarch was 'the white stone' which is power-

ful against flying venom. In these times the priest was the doctor's rival in medicine, the cure of bodies as well as souls being claimed. Mrs Rohde has studied the MS. with great care, and gives a scholarly and literary account of its contents.

The earliest illustrated herbal of Saxon times is a translation of the Latin "Herbarium Apuleii Platonici" (supposed to date from the 5th century), which belongs to the school of Aelfric of Canterbury, circa 1000-1050. It is also in the British Museum. Each of the 132 chapters contains the description of a herb but many of the plant illustrations are copied from an older work, itself probably not the original drawing. Dr Singer once took the writer to see this wonderful work with its coloured frontispiece in which Plato is repre ented as holding a volume which has been given him by Aesculapius and the Centaur.

"The Lachnunga," or Liber Medicinalis, likewise in the Harleian MSS. of the British Museum, dates from the tenth century. It is a small, thick volume without illustrations. It was acquired by a great investigator of Anglo-Saxon documents, Humfrey Wanley—once an assistant at the Bodleian Library, who received a stipend of £12 a year—towards the end of the seventeenth century from Barbara Crokker, who could not read and doubtless knew nothing of the value of the book. A fascinating account is given of these early MSS. which teem with points of interest. It shows how in those early days a wide knowledge of medicine was possessed, mingled as it was with dense superstition, in a few of its phases bearing resemblance to some of the practices of the present day. It bears evidence to the extensive use of medicines obtained from far distant lands showing that communication with the outer world was more prevalent in those distant times than we are wont to suppose.

The centuries succeeding the Norman Conquest proved a dull time for science and we find no important work on plants for many years, but the various transcriptions of Macer's Herbal, and of the works of Bartholomaeus Anglicanus are fully acknowledged. It may be mentioned that the "Sinonima" of that author was printed at Oxford in 1882. The "Breviarum" is preserved in Pembroke College, Oxford. The "De Proprietatis Rerum," of 19 books, was, says Mrs Rohde, probably written about the middle of the 13th century. Oxford has a copy, dated 1296. It was translated into

English in 1398 by a Cornishman, John de Trevisa, a Fellow of Exeter College, and Chaplain to Lord Berkeley. The " De Herbis," printed in 1495, abounds with delightful pictures of medieval life, and contains probably the first botanical illustration printed in an English book. Its printer, Wynken de Worde, says that Caxton had a hand in its publication which, however, is not accepted by modern bibliographers. We are told by Wynken de Worde that " John Tate the yonger which late hathe in England doo make this paper thynne. That now in our Englysh this boke is printed Inne." The first evidence of English-made paper.

Strictly speaking the first English Herbal is that of Richard Banckes, published in 1525, which went through several editions, two being erroneously attributed to Ascham, the Astrologer. Of the second edition the only known copy is in Cambridge University Library. It was far more interesting than the better known "Grete Herbal," which was printed in England in 1526, a translation of the French " Le Grand Herbier," itself adapted from the " Circa Instans," written by Bartholomaeus in 1458. Its English publisher was Peter Treveris who had a printing office in Southwark. The third chapter is allotted to William Turner, the Father of British Botany, of whose life and works a most excellent account is given. Full justice is also done to Lobel and Dodoens. Another chapter is devoted to John Gerard and his " Herbal " in which discriminating praise is accorded to the great botanist. One is glad to see the tribute to " his matchless Elizabethan English." It may be added that Gerard added eighteen original woodcuts, one of which represents the " Virginian " Potato, to the 1780 which he had borrowed from Nicholas Basseus of Frankfurt, and which had already appeared in the " Eicones " of Tabernaemontanus. It is pleasing to read extracts from Gerard's London plant localities of *Sagittaria* " growing in the Tower Ditch and Vervain Mallow on the ditch-sides on the left hand of the place of execution by London called Tyburn."

A delightful feature of the book is the account of the early herbals relating to the New World, the earliest cited being that of Nicolas Monardes, a Sevillian doctor, written in 1569 when Spain was at its zenith of power. Clusius translated it into Latin. Mrs Rohde gives a fascinating account of these and delectable extracts

which one would like to have quoted. Here we get perhaps the earliest use of the name *Tacamahaca* ' a rosin of a very sweet smell,' taken out of a tree as large as a willow. The name is now misapplied to a Poplar. The second part gives the first account of the ' hearbe tabaco.' Sassafras is also mentioned. The native Indians described its medicinal effects to the Spaniards. Accounts are also given of Josselyn's " New England's Rarities Discovered," and of Hughes' " The American Physitian," of 1672, and Petiver's account of Feuillé's " South Sea Herbal " of 1715. Then follows a chapter of John Parkinson with an excellent account of his two great works the " Paradisus " and " Theatrum." The later seventeenth century herbalists include Nicolas Culpeper and the Oxfordshire William Coles, the author of " Simpling " and of " Adam in Eden." Some amusing extracts from still-room books, compiled by distinguished people, are given, but still-rooms are things of the past. The bibliographies, or rather the list of Herbals, MSS. and printed, arranged in chronological order, extend to 46 pages and are of extreme value. The list might be even made more useful by having an index to the authors' names and by adding the page of the book to such as are mentioned in the text. The book is singularly free from misprints but ' Hutton, 76, Bodleian ' should be Hatton, 76, Bodley or Bodleian Libr. References might have been made to Earle's " English Plant Names," which treats of those used in the Herbals from the tenth to the fifteenth century, to Mowat's " Alphitá," a Medico-Botanical Glossary of about 1465, which is substantially that published in Renzi's " Collectio Salernitana," to Bentley and Trimen's " Medicinal Plants," to Hanbury and Flückiger's " Pharmacographia," and Woodville's " Medical Botany." But these are trifling matters. The book holds one so that it is difficult to release oneself from its spell. It should be on the shelf of every flower-lover who wishes to know something of the history of the thing he loves.

SALT, HENRY S. THE CALL OF THE WILDFLOWER. pp. 192, 1922. G. Allen & Unwin, London; 6/-. In this breezy book of Mr Salt's we are carried into pleasant scenery with a charming guide. He loves the flowers and the country which they haunt. Nor are his interests limited to plants and their habitats. The places he con-

ducts us to are pleasant spots—the Sussex Shingles—'salt and splendid from the circling brine'—Shoreham with its introduced *Trifolium stellatum* and its native *Vicia lutea*, or Pagham with its Proliferous Pink. "By Ditch and Dike" includes a sketch of those rich hunting-grounds—the Amberley Wild Brooks, the Pevensey levels, or the Lewes meads. Mr Salt has not an unwonted admiration for botanical nomenclature, and he rightly condemns the indiscriminate use of "Common" as an English appellative since as he says any one searching for the "Common hare's-ear" would find that he had got his work cut out. He dislikes, too, personal names for genera, such as *Hottonia* or *Hutchinsia*. His reasons, however, are not convincing. He is more contented and more at home on the open downland, where the pride of Sussex, the *Phyteuma orbiculare*, grows, or the early Spider Orchis gladdens the eye, or near the Ditchling Beacon where he can see the Musk Orchid and enjoy the freedom and space which the Downs afford. He makes a sturdy protest against those marauders who take plants away in such quantities as to threaten the very existence of the species. A delightful chapter is devoted to "A Sandy Common," with all its varied vegetation, nor are the Derbyshire Dales omitted with their *Silene nutans*, *Hutchinsia* and *Draba muralis*. But why should *Draba* be spelled with a little "d" and *Thlaspi* with a little "t"? "Limestone Coasts and Cliffs" are illustrated by the Orme's Head and Arnside Knott, but we may say that the *Cotoneaster* he saw at Capel Curig was not the rare Orme plant, which once rejoiced in the inapplicable name *vulgaris* but a Himalayan cousin *C. microphylla*. "A Northern Moor" refers to the splendid area round High Force in Teesdale with all its splendid plants, and in "Snowdonia" he describes an April visit. A good description is given of its splendid scenery, and of the places of growth of *Lloydia* and *Saxifraga oppositifolia* of which it is said that it is a true Alpine not found in this country much below 2000 feet. In Sutherlandshire the writer has seen it at less than 200 feet in great beauty. On Helvellyn he describes the *Cerastium alpinum* and the rich growth of the alpine lady's mantles with which the Lake District abounds. Needless to say the book is written with a literary charm which will delight a large circle of readers.

RUSSELL, T. H. MOSSES AND LIVERWORTS. An Introduction to their Study, with Hints as to their Collection and Preservation. pp. 200. Sampson, Low, Marston & Co., London, 1908. This work, written by a friend of our old member, J. Bagnall, has recently been brought to my notice. It may be of service to those who are beginning the study of these groups since it abounds with practical information.

SALMON, C. E. *Statice anfracta*, a Dalmatian species, described in Journ. Bot. 345, 1922.

SANDERS, T. W. LIST OF HYBRID ORCHIDS, containing all the known Orchids of hybrid origin with their parentage and synonyms. With addenda up to September 1921. London, 1921.

SARGENT, C. SPRAGUE. MANUAL OF TREES OF NORTH AMERICA. Edition 2, pp. 900, 783 figures. Constable & Co., London, 1922; 46/-. It includes descriptions of 717 species belonging to 85 genera.

SCHLICH, Sir WILLIAM. MANUAL OF FORESTRY. Vol. I. Forest Policy of the British Empire. Fourth edition, revised and enlarged. pp. xi., 342. Bradbury, Agnew & Co., London, 1922. In this, the fourth edition of a very important work, Sir William Schlich has endeavoured to give an account of the condition of forest conservancy in the Empire as it stood in July 1920. He gives figures showing the immense importance of Forest Maintenance since nearly £70,000,000 of products were imported into Britain in 1913. The great bulk was unmanufactured timber, amounting to nearly half the whole, *i.e.*, £33,789,000. Manufactured timber and wood-pulp came to over £8,000,000. The next most valuable product is caoutchouc to the value of £14,000,000. Sir William pleads for active assistance in providing woodlands in the vicinity of great towns in England, not only for the æsthetic and ethic effects of forest life and scenery, but because their produce will find a ready sale at good prices. Their establishment under rational treatment need not be a financial burden. Forests, as he says, offer a convenient opportunity for the investment of capital and the profitable utilisation of inferior land. They produce a demand for labour in the management and working; they reduce evaporation

and increase the relative humidity of the air. These are only a few of the advantages he claims. Britain, as compared with Continental countries, has a small amount of land under forest, and during the war this was greatly diminished, so that our woodland is well-nigh negligible. Only 0.07 of area per head of population is possessed by us as compared with .62 in Germany and France and 9.4 in Sweden. Taking our Empire as a whole Sir William estimates its population at 447,000,000 and its area at 14,000,000 square miles, the population numbering 378 to a square mile in Europe, 3 in Canada and 2 in Australia. Our net imports of timber amount to 217,730,000 cubic feet.

A very interesting chapter is devoted to the Forests of Britain and their produce. Extremely valuable statistics are supplied as to the sources of imported timber. Forestry in India is treated in a masterly way: indeed there is no higher authority on the subject. Canada and Australia are both adequately noticed and due attention is paid to Ceylon, our African possessions and to the West Indies. It is an indispensable volume to every School of Forestry and British landlords may find in it a source of profit as well as pleasure.

SCHARFF, R. F. Thirty Years' Work of the Irish Naturalist, in Irish Nat. xxxi., 1-7, 1922.

SCHÖNLAND, Prof. S. INTRODUCTION TO SOUTH AFRICAN CYPERACEAE. 8vo, pp. 72, tt. 80. Bot. Survey of South Africa, memoir n. 3, Dept. of Agric. Pretoria, 1922; 10/6.

SEWARD, A. C., F.R.S. The Hooker Lecture—A Study in Contrasts. The Present and Past Distribution of Certain Ferns. Journ. Linn. Soc. xlix., 219, 1922. A SUMMER IN GREENLAND. pp. lxiv., 100. Cambridge University Press, 1922; 7/-.

SHEPPARD, T., M.Sc., F.G.S. HANDBOOK TO HULL AND EAST RIDING OF YORKSHIRE. Prepared for the Members of the British Association . . . on the occasion of their visit to Hull 1922. pp. vi., 532. A. Brown & Sons, London, 1922. This compact, yet handsome volume, does infinite credit to the Hull Committee and to the Editor and Contributors of the various chapters who have so successfully dealt with a difficult task. The chapters include the

Evolution and Past History of Hull; its Antiquity, and the Rise and Progress of the Port, the latter by Sir A. K. Rollit, K.B., who died before the work appeared. With regard to the health of the town it may be said that while the death-rate in 1874 was 23.8, in 1921 it was only 13 per thousand. Hull Coins and Tokens are described by W. Sykes, and many of them are figured. An interesting chapter is devoted to Old Farming Methods in East Yorkshire, and Mr Strachan describes its agriculture. Prehistoric Remains and the Romans and Anglo-Saxons in the East Riding are by the Editor. Mr John Nicholson writes on the Place-Names of the area. The changes in the surface are evidenced by the chapter on the Lost Towns of the Humber. The zoological side is well treated. Dr Irving contributes an article on the Marine Mollusca, and Mr J. W. Taylor an important paper on Land and Freshwater Mollusca. The Crustacea, Coleoptera, Lepidoptera, Diptera, Hymenoptera, Arachnida and Plant Galls are also described. The Botany of East Yorkshire is from the pen of Mr J. Fraser Robinson. The Non-Vascular Cryptogams are not overlooked. Naturally it is the Botany in which we are most interested, and Mr Robinson has done his work in a very capable manner. It may be well to give the census of species which Mr Robertson supplies. I have added the numbers which occur in Berks for comparison, but it must be remembered that the standard of species is not the same in both counties.

Type.	Britain.	E. Riding.	Berks.
British, ...	532	532	931
English, ...	409	291	
Germanic, ...	227	28	78
Atlantic, ...	70	4	10
Highland, ...	120	—	3
Scottish, ...	81	20	19
Intermediate, ...	37	10	9
Local, ...	49	3	8
Total, ...	1525	888	1058
Alien, Casual, ...	—	143	324
Incognita, ...	—	19	12
	1525	1050	1394

The members of the British Association were fortunate in having such a useful volume supplied to them.

SHULL, G. H. Three New Mutations in *Oenothera Lamarckiana*, in Journ. Hered. 354-363, 1921.

SKIPPER, E. G. The Ecology of the Gorse (*Ulex*) with special reference to the growth-forms on Hindhead Common, in Journ. of Ecology x., 24-52, 1922.

SPRAGUE, T. A. The Seedling Foliage of *Ulex Gallii*, in Journ. Bot. 6, 1922. The Nomenclature of Plant-Families, *l.c.*, 69, 1922. The Type Species of *Bignonia*, *l.c.*, 236, 1922. Revision of *Amoreuxia*, in Kew Bull. 97, 1902, with key to the species, three of which are new.

STEBBING, E. P. THE FORESTS OF INDIA. Two. vols., 8vo, pp. xv., 548. J. Lane, London, 1922; 42/-.

STELFOX, A. W. *Prunus Padus* in Wicklow and Kilkenny, in Irish Nat. xxx., 145, 1921. *Carex axillaris* in Co. Dublin, *l.c.*, xxx., 145-146, 1922. *Poa compressa* survives! *l.c.*, xxxi., 95, 1922. Botanical Notes from S.-E. Wexford, *l.c.*, xxxi., 100-2, 1922.

STEPHENSON, T. & T. A. Hybrids of *Orchis purpurella*, in Journ. Bot. 33, 1922. *O. insignis* (*O. purpurella* × *latifolia*). Aberystwith and Arran. *O. formosa* (*O. purpurella* × *ericetorum*). Ambleside and Arran. *O. venusta* (*O. purpurella* × *Fuchsii*). Aberystwith, Ambleside, and Arran. *O. Orchigymnadenia varia* (*Gymnadenia conopsea* × *O. purpurella*). Arran. Three figures are given.

STOREY, F. W., and WRIGHT, K. M. SOUTH AFRICAN BOTANY. 2nd edition, pp. vi., 220, with six plates in colour and 113 text illustrations. Longmans, Green & Co., London, 1922; 6/6. This is not a Flora or a description of African plants, but is a handy little volume on plant structure and physiology, a chapter being devoted to Classification. The Families described are those prescribed in the syllabus for Matriculation in the Cape University. The appendix gives methods for preparing plants for the herbaria.

The examples chosen for illustration are plants of the Cape. That it is a serviceable text-book is shown by the demand for a second edition.

STOUT, Mrs CHARLES H. THE AMATEUR'S BOOK OF THE DAHLIA. pp. 314, tt. vii. W. Heineman, 1922; 10/6. From the foreword we quote: "For you, dear friend, amateur of the Dahlia, this book is written. You are rich beyond millions, with God's treasures; yet you know it not. Your wealth is stored away, and this key is made to fit the lock of your treasure house. Your questions, asked often with shy apologies, needed no apologies; they taught me how to fashion the key, and I am grateful. So open wide, dear friend. Take these God's gifts for the asking. One flower cannot represent the race; one variety is not the whole species. Have abundance—and share it with all who come your way. Plant your seeds and your bulbs, and the great Artist will come down and work with you. Your hoe will become a wand, and beauty will spring from the brown dead earth which you have touched. He will break up the rainbow and paint the blossoms with the pieces; and you will feel a thrill of joy at thought of partnership with Him who made the world so beautiful." The Dahlia was discovered in Yucatan in Mexico by the Spanish when in 1570 Philip II. sent Francisco Hernandez to study that country. After Hernandez' death there was published "Quatro libros de la naturaleza y virtudes de las plantas y animales que estan recevidos en el uso de medicina en la nueva Espana," but it was not until the edition printed in Rome in 1651 that the two varieties of Acocotli and Cocoxochitl were included. These are the earliest figures of the plant of which they seem to be cultivated varieties. In 1789 the first seeds reached Europe and they were cultivated in the Royal Gardens at Madrid by the Abbé Cavanilles. That eminent botanist named the Dahlia after Andreas Dahl, a Swedish botanist, then living in Berlin, giving it the specific name *pinnata*. It was figured in his splendid "Icones" in 1791. At that time the Earl (not the Marquis) of Bute was Ambassador at the Spanish Court. Jack Boot, as he was irreverently called, was a patron of Botany, and of botanists, notably Sir John Hill, but the Marquisate was not given him till 1796. Lady Bute sent some seeds home about 1790. These did not germinate, but

Lady Holland sent others in 1804 from which the first Dahlias were grown in Britain. In 1872 the Cactus Dahlia was introduced. The home of three out of the eight species of Dahlia known (there are over 4000 varieties now catalogued) is the Terra Fria in Mexico where, at Pedigral, at an elevation of 6000 feet, there are found acres and acres of them in every hue and colour. "For successful culture they must have two things, fresh air and moisture. An open, level bit of land bathed in the morning sun, a few tall trees to shade them shortly after noon, a gentle rise of the ground at the back perhaps which will shed its overplus of rain upon the beds and the site is ideal." In a similar situation, as at Mr Reginald Cory's garden at Duffryn, in Glamorganshire, Dahlias may be seen in such dazzling variety as to make the observer almost gasp at the colouring. The book can be very strongly recommended to any who are interested in Dahlia culture. It is by no means dry reading.

TAHOURDIN, C. B. Some Notes as to British Orchids, 1921. The author gives records of the occurrence of the various British Orchids and remarks upon their scarcity or abundance. His correspondent was unable to find *Liparis* from Ham Ponds, but the plant may well have once occurred there. Of *O. hircina* he says, Mr Fox has successfully raised it from seed. In a Canterbury specimen there was no trace of purple on the 'ribbon.' A specimen from near Lewes had 96 flowers. It has also been noted from East Sussex and near Steyning, and near Bures in North Essex in 1919. In the 1922 Notes are good photographs of '*O. latifolia*,' *O. praetermissa*, *O. ericetorum* (the true *maculata*), and *O. hircina*. He records from Aldsworth *O. incarnata* × *praetermissa*. He was unable to find *Cephalanthera rubra* at High Elms, Kent.

TANSLEY, A. G. ELEMENTS OF PLANT BIOLOGY. Cr. 8vo, pp. 410. Allen & Unwin, London, 1922; 10/6.

THELLUNG, Dr ALBERT. Zur Terminologie der Adventiv und Ruderalfloristik, in Allgem. Bot. Zeitsch., p. 36, 1918-9. Received March 13, 1922. Herborisation à Zermatt, in Le Monde des Plantes, n. 23, p. 138, 1922.

THOMPSON, H. S. Changes in the Coast Vegetation near Berrow, Somerset, in Journ. of Ecology, x., 53-61, 1922.

THOMSON, Hon. G. M., M.L.C. THE NATURALISATION OF ANIMALS AND PLANTS IN NEW ZEALAND. pp. x., 608. Cambridge University Press, 1922; 42/-.

THURSTON, EDGAR, C.I.E., and VIGURS, C. C., B.A., M.D. A Supplement to F. Hamilton Davey's Flora of Cornwall. Reprinted from Journal of the Royal Institution of Cornwall, vol. xxii., pp. xx., 172, 1922. Despite the laborious work at the county flora by Davey and the multitudes of botanists who from time to time explored the delectable Duchy and whose records were fully quoted in the Flora, yet in the 12 years which have intervened since its publication, thanks to the persevering efforts of the compilers, a large and important number of additions are entered in these pages. Mr Thurston, it may be well to say, has spent several years in making a representative herbarium of county plants which he has generously presented to Kew, where they are separately stored, so that they can be easily consulted. An analysis of the Additions works out as follows:—Species recorded in the Flora as 'doubtful or an error' and which are now included are *Isatis tinctoria*, *Silene conica*, *Arenaria tenuifolia*, *Medicago minima*, *Senecio squalidus*, *Chenopodium glaucum*, *Euphorbia Esula*, which are probably not indigenous, and *Malaxis paludosa* and *Nitella gracilis*, which are indigenous. The plants which are claimed as British and not recorded in the Flora are *Thalictrum dunense*, *Fumaria paradoxa*, *F. neglecta*, *Viola epipsila*, *Dianthus deltoides* (casual), *Rubus Scheutzii*, *Pyrus intermedia* (alien), *Hieracium Peleterianum*, *H. silvaticum* W. & N. (Gouan is the authority), var. *microladium* Dahlst., *Verbascum pulverulentum* and *Veronica triphyllos* (but neither native), *Euphrasia Kerneri*, *E. stricta* (this is very doubtful), *E. confusa*, *Ajuga pyramidalis* (alien). [This proves to be *A. genevensis* L.] *Salicornia appressa*, *Sagittaria*, *Agrostis verticillata*, *Mibora*, *Poa palustris* (the last three adventive), *Isoetes Hystrix* (a solitary specimen), and *Chara delicatula*. *Atropis festuciformis* is probably a variety of *Glyceria maritima*. *Fumaria muralis* and *Hieracium brunneo-croceum* are in the Addenda. The British varieties have been increased by 142, hybrids by 17, and the alien species and varieties to 110, to which may be added the seven mentioned among the British species.

This makes a splendid addition to the already large Flora. It may be added that *Diotis*, which was thought to be extinct, still occurs. There is a very appreciative memoir of Davey by Dr Vigurs, which puts the botanical side of Davey's life in a clear and concise form. We heartily congratulate the compilers at the completion of a very laborious undertaking. The Supplement will surely increase the number of botanical visitors to Cornwall.

TRELEASE, Prof. W. PLANT MATERIALS OF DECORATIVE GARDENING. The Woody Plants. Edition 2, pocket size, pp. xliii., 177. University of Illinois, 1921, 1 dollar, post paid by author from Urbana, Illinois. WINTER BOTANY, 2.50 dollars. In these two portable volumes, measuring 4½ by 6 inches, the author has given keys by which a large number of North-Eastern American trees can be run down to their respective species. The terms used are simple and the directions are extremely clear. There is a useful glossary. In "Winter Botany" the author has given some excellent drawings of the winter-buds and other details. This part is arranged in systematic order, and under each genus the chief members of it have given the contrasting characters as exhibited in winter. Under *Salix* 13 species are described. The key runs:—

1.	Weeping	2.
	Not markedly weeping	4.
2.	Twigs very slender, glabrous	3.
	Twigs stout, villous	*S. caprea-pendula.*
3.	Buds alternate	(1) *S. babylonica.*
	Buds often opposite	*S. purpurea.*
4.	Buds large, 5-10 mm. long	5.
	Buds moderate, 4-6 mm. long	7.
	Buds small, scarcely 3 mm. long	9.
5.	Buds rather sharply two-winged	6.
	Buds plano-convex	(2) *S. missourensis.*
6.	Buds, green and red, planted	(3) *S. caprea.*
	Buds blackish, native	*S. discolor.*
7.	Buds frequently opposite	*S. purpurea.*
	Buds always alternate	8.
8.	Twigs glossy, olive, glabrous	*S. lucida.*
	Twigs dull, velvety	*S. incana.*
9.	Trees: Twigs mostly glabrescent	10.
	Shrubs: Twigs gray-velvety	13.
10.	Twigs olive-green	11.
	Twigs golden	*S. vitellina.*
	Twigs red	*S. vitellina Britzensis.*
11.	Large open trees	12.
	Slender, pole-like	*S. longifolia.*
12.	Trunks mostly clustered	*S. nigra.*
	Trunk single: twigs sometimes velvety	*S. alba.*
13.	Buds, 3 mm. long	*S. humilis.*
	Buds, 2 mm. long	(6) *S. tristis.*

Under the Poplars nine species, three varieties, and one hybrid are similarly treated. *P. nigra* has the twigs rather slender and of moderate growth, while *P. deltoides monilifera* has them stout and the tree is of large growth with the buds glabrous. In *tremula* these are somewhat downy, in *canescens* the tomentum is gray, and in *alba* it is white.

TROUP, Prof. R. S. Report on Forestry in Kenya Colony and in Uganda. Crown Agents for the Colonies, 1922; 5s each.

TURRILL, W. B. Notes on Cyperaceæ. *Pycreus pumilus* and *P. hyalinus*, in Kew Bull. 122, 1922. *Isotheca*, gen. nov., described in Decades Kewenses, Kew Bull. 187, 1922, from Aripo, Trinidad, with one species, *I. alba* Turrill.

UNITED STATES DEPARTMENT OF AGRICULTURE. Check List of Publications of the State Agricultural Experiment Stations on the subject of Plant Pathology, 1876-1920. Compiled in the Library of the Bureau of Plant Industry, April 1922. LIST OF FUNGI (Ustilaginales and Uredinales). Prepared for Exchange, Dept. Circular N. 195, February 1922.

VACHELL, ELEANOR, F.L.S. The Leek—The National Emblem of Wales. Cardiff Naturalists' Society 26, 1919. This gives a very complete history of the Leek in Welsh History, and Miss Vachell dismisses the claims of the Daffodil, *Narcissus Pseudo-Narcissus*, to be the Welsh Leek holding, as she does, and assuredly correctly, that it is the leek *Allium Porrum*, itself perhaps a cultivated race of *Allium Ampeloprasum*. The Leek is mentioned in the leech-book, Meddygon-Myddveu, of the 12th century.

VALLENTIN, Mrs E. F., and COTTEN, Mrs E. M. ILLUSTRATIONS OF THE FLOWERING PLANTS AND FERNS OF THE FALKLAND ISLANDS. tt. 64, Mrs Vallentin. Lovell, Reeve & Co., 1921; £4 4s.

VEGETABLE RENNET. In Nature (543, 1922) R. Hedger Wallace, 4 East Grove, Cardiff, asks for the names of plants used in various countries for coagulating milk in place of rennet. Of the British species used for this purpose he names *Galium verum*, *Carduus nutans*, *Datura Stramonium*, and *Pinguicula vulgaris*. The

foreign species include *Withania coagulans*, *Ficus Carica*, *Cnicus Benedictus*, *Cynara Cardunculus*, *C. Scolymus*, *Drosera peltata*, *Pisum sativum*, *Lupinus hirsutus*, *Ricinus hirsutus* (sic ? *communis*), *Leucas Cephalotes*, *Crotalaria Burhia*, *Rhazya stricta* and *Streblus asper*. To these may be added *Drosera rotundifolia*.

VELENOVSKY, Prof. JOSEF. BOHEMIAN MUSHROOMS, 4 vols., pp. 920, Prag, 1920-22.

WATERFALL, CHARLES. Plants from the County of Cheshire in his Collection, 1910-14. Reprint.

WARD F. KINGDON. His Sixth Expedition in Asia, in Gardeners' Chronicle. Eighth article, 1922.

WATSON BOTANICAL EXCHANGE CLUB. Thirty-eighth Annual Report, 1921-2. Distributor, W. R. Sherrin. Contains a key to British species of *Juncus* by the distributor.

WHITE, J. WALTER. Obituary (with portrait) of Cedric Bucknall, in Journ. Bot. 65, 1922.

WILLIS, J. C. AGE AND AREA. A Study in Geographical Distribution and Origin of Species, with chapters by Hugo de Vries, H. B. Guppy, Mrs E. M. Reid, and Prof. James Small, pp viii., 260, Cambridge University Press, 1922; 14s. On the cover the author says "he has endeavoured to free himself from the trammels of the natural selection theory and to work as if he had found himself in another planet where scientific investigation was just beginning." As he says in the preface when he took up the study of distribution he found that the current theories provided an explanation that was not only unnecessarily complex but one that did not explain. Gradually it was borne in on him that plants spread very slowly, but at an average rate, determined by the various causes acting upon them, so that age forms a measure of dispersal when one is dealing with allied and similar forms. Age as explanation of spread, is enormously simpler than natural selection. Nine chapters are devoted to "The Present Position of Age and Area." The theory, like so many others, is not new, Lyell, in 1853, and Hooker, in the same

year, came very near to the same conclusion and, as Dr Willis very generously says, " had it not been for the appearance and rapid rise of the great theory of Darwin, with its inevitable diversion of effort into other, and at the time, more profitable lines, it is evident that Hooker or some other worker of an earlier time would have discovered not only the principle which I have termed Age and Area, but also the many and remarkable conclusions to which it leads." Observations on the species found on pollard-willows, Dr Willis claims, show that even a barrier of distance so small as the ground is to the willow-top effectually prevents the spread of many species. He never noticed the Daisy and Clover on them, nor yet the Orchid. The majority consisted of fleshy-fruited plants, bird-carried, while the Dandelion as a type of wind-specialised fruits was frequent. Surely Dr Willis has not taken into account two important factors—soil and sunlight. The first, as it occurs on the willow-top, consists of humus in which mineral constituents are well-nigh absent, and (2) the shade afforded by the foliage is fairly complete. Again, there is little moisture. Thus the conditions are inimical to the growth of the plants mentioned. A twelve-foot wall is not a barrier to a daisy, for I have seen plants growing on such an one, and it is inconceivable to believe that such a small elevation as a pollard-willow is too much for the wind to convey an Orchis seed when we know they are blown for long distances to a shingly shore, but many seeds fall on unsuitable soil and they die. On Ritigala, in Ceylon, a solitary precipitous peak about 40 miles from the main mountain-mass in Ceylon, of the 103 wet-zone plants growing there 24 had fruits suitable for bird-carriage, 49 had light fruits fitted for wind dispersal, 40 were doubtful. Here 30 plants were carried 40 miles most probably by birds. Krakatau, in 1883, was sterilised by the famous eruption. Three years after Dr Treub found 11 spore-carried ferns, 9 flowering plants, growing on the shore, current-borne, and 8 growing inland, four of these being wind-carried Composites, 2 Grasses, *Phragmites* and a *Pennisetum*, likewise wind-borne, *Phragmites*, and two fleshy-fruited species bird-carried. Eleven years after there were 50 flowering plants, 30 due to sea and 16 to air-carriage. In 1905 the number had increased to 137, but the distance proves a serious barrier since Java possesses 5000 species. Thanks to the virgin soil, Krakatau received and

nourished a larger number than Ritigala offers even after an indefinite period of time, dating back to the Tertiary period. Dr Small has shown that the distribution of Composites is favoured by the pappus fruit being able to float about two miles an hour for an indefinite period, so long as the relative humidity of the air remains at a figure that keeps the pappus open, but if the humidity increases the pappus closes and the fruit falls, hence a barrier to long sea-journeys. Ridley's observations on *Shorea*, a tree a hundred feet high, show that it was not able to scatter its fruits freely beyond a hundred yards. Therefore it would take 60,000 years to migrate a hundred miles; slower than a glacier or the L. C. & D. The argument of Dr Willis is that immense time is needed for plant distribution. He says that 4000 areas of a square yard each (or of a single acre) upon a moor or forest would not receive 80 new species in a hundred years even though these might be growing within 200 yards. "It is doubtful if they would even receive one or two." Nor would an area equal in size to Krakatau of a tropical savannah receive 137 new species in less than 40 years. It is a completely incorrect view to think of plants in general as travelling rapidly about the world, in fact dispersal is a very slow process. Of the ten largest families in the world only the first two, the *Compositæ* and *Orchidaceæ*, are remarkable for the possession of extra good methods of dispersal, yet they have the largest number of genera. This fact, he says, goes to show that dispersal has not altogether depended upon the possession of a good 'adaptation' for the purpose and also when one takes long periods and large numbers it is to a marked degree mechanical. Hooker in 1888 wrote, "The conditions which have resulted in Monocotyledons retaining their numerical proportion of 1 to 4, or thereabout, of Dicotyledons, in the globe and all large areas thereof, are, in the present state of science, inscrutable." Mr Willis sums up by saying that more than half of the most cosmopolitan genera have little or no mechanism for dispersal, and this is not well marked, on the whole, in the largest and most widely distributed families. A fascinating chapter is devoted to the causes which favour or hinder Dispersal. He says that *Festuca ovina* is so abundant and successful upon the chalkdowns that one is tempted to think it is a chalk plant till one finds it almost as common upon a bilberry moor in Derbyshire or a grass moor in Scotland on a peaty

soil. Does not this raise the question, are the chalk plant and the peat-moor plant identical? I have long believed them to be distinct species and that each might be used as an index to soil-condition, *F. ovina*, the calcareous species, *F. tenuifolia* or *paludosa*, the acid-soil plant. Comparative culture for several generations is needed to settle this question which is not less important to the ecologist than it is to the agriculturist. Nor are we convinced that distribution is so slow as he contends. Twenty years sufficed for *Elodea* to be dispersed through Britain.

The Age and Area rule is thus summarised:—"The Area occupied at any given time, in any given country, by any group of allied species at least ten in number, depends chiefly, so long as conditions remain reasonably constant, upon the ages of the species of that group in that country, but may be enormously modified by the presence of barriers such as seas, rivers, mountains, changes of climate from one region to the next, or other ecological boundaries, and the like, also by the action of man, and by other causes." He claims he has proved this by prediction of plant occurrences in New Zealand and the adjacent islands. Dr Small contributes an erudite article, and concludes by saying that so far as the Compositæ are concerned on the whole, both the average generic area and the average number of species or genera are closely related to absolute age. Endemism affords a delightful chapter. One of the very local species mentioned is *Campanula Vidalii*, which an old Secretary of this Society discovered on rocks near Flores in the Azores. It also grows on S. Maria and it was reported from S. Miguel, but the local botanists had never seen it there. In climbing up a lava wall on the north side of the island I saw it growing on the precipitous sea-cliff in some quantity, but it is known from nowhere else in the world. Madagascar has 266 endemic genera, South America and Africa about 1730 each. Islands have the smallest proportion, and he holds that endemic species and genera are young beginners, and probably the descendants of other genera still existing. There are 4853 monotypic genera or 38.6 per cent., 1632 ditypes and 921 tritypes, while at the other end there is the gigantic genus *Astragalus* with 1600 species. One has only been able to skim the contents of this suggestive work, but enough has been said to show that it is a volume which all systematists should possess. Dr Willis

has elsewhere dealt with such problems as those afforded by some of our very local species. *Lychnis alpina*, *Oxytropis campestris*, *Astragalus alpinus* and *Lloydia* may be the battle-ground for those who may think them relics of a widely distributed species or for others who consider them recent arrivals. Whether in the latter case wind or birds have been the dispersal agent has to be thrashed out. They stand in a different category to *Hydrilla*, *Eriocaulon*, *Tillaea aquatica*, and, perhaps, *Naias marina*, for it requires no stretch of imagination to attribute the occurrence of the latter to waterfowl, especially as a seedless plant like *Elodea* has been carried over the whole of Britain and to upland tarns and lochs many miles distant from the nearest habitat and all in less than a century. As regards sea-dispersal one must not forget sea-spume dispersal, which is a more important factor than is generally understood. Small seeds are entangled in this and the effects upon such wind-swept areas as the Shetlands and Faroes must be considerable.

WILLIS, Dr J. C. AGE AND AREA. See Nineteenth Century, October, 1922. He says that Natural Selection "has received so severe a shake that it is no longer a name to conjure with."

WILSON, A. West Yorkshire Botanical Notes, in Naturalist 397, 1922. He records *Hedera Helix* at 1570 feet on Cantley Crag, with *Lonicera Periclymenum*.

WILSON, ERNEST H. THE ROMANCE OF OUR TREES. Doubleday, Page & Co., New York, 1920.

WRIGHT, WALTER P. PRACTICAL GARDENING. For Pleasure and Profit. Six volumes. The Educational Book Co., Ltd.; £4 5s.

WRIGHT, HORACE J., and WALTER P. BEAUTIFUL FLOWERS AND HOW TO GROW THEM. Illustrated with 32 plates in full colours from paintings by Beatrice Parsons, Eleanor Fortescue Brickdale, Hugh L. Norris, Margaret Waterfield, A. Fairfax Muckley, Francis G. James, Anna Lea-Merritt and Marie Low, pp. 402, T. C. & G. C. Jack, London and Edinburgh; 10s 6d. In the seventeen chapters the authors give in a pleasing way much useful information about the cultivation of those plants which are more commonly met with

in gardens. Incidentally many interesting literary references and thoughtful observations are added. "Roses" form the subject matter of the first chapter, "Bulbs" that of the second, and here the Lilies and Tulips are well treated. The third is devoted to "Hardy Herbaceous Plants," a group especially attractive to those of narrow means, but it is not every one who can afford a bed 'twelve feet wide,' which is recommended. To those who can, a splendid effect is produced. Let any one who can, visit the noble herbaceous border at Goodwood with its magnificent clumps of Salvia, Delphiniums and Thalictrums, and he will not regret the old days of carpet bedding. To illustrate the herbaceous border there is a beautiful picture of the Christmas Rose and *Chionodoxa*, a little sheltered by Fern in the bed at Kew Gardens. One is glad to see due praise given to the *Kniphofia*. I shall never forget a border of it in Madeira outlined against the blue sky. It formed one of Miss Acland's most successful pieces of colour photography. Alas! the slide was smashed in showing it to Dr Graben, but one can still call to mind the wonderful colour scheme that garden displayed. Another charming picture represents the *Hippeastrum* with its glorious display contrasting, as it does most effectively, with its companion, the feathery *Spiraea*. "Rockery Plants" have a short but useful chapter and "Greenhouse and Hothouse Flowers" are dealt with at some length. "Window and Room Plants," "Carnations," "The Dahlia" and "Sweet Peas" are adequately dealt with. "Annuals," whose name is legion and whose colours are those of the rainbow, have a selected list given, as also have "Half-Hardy Annuals." There is a chapter on "Water Lilies and other Aquatic Plants," where it is shown how successfully even in a small garden Water Lilies may be grown. "Arches, Pergolas, Pillars and Stumps" and "Beautiful Walls and Fences" are treated of, and the chapters abound with practical suggestions. "Orchids" are a class by themselves, and their devotees should be richly endowed, but "The Chrysanthemum" appeals to a wider circle, and for cultivation a representative selection is given. "Tender Bedding Plants" are appreciatively dealt with, and the chapter will appeal strongly to the readers of this charming book. Another excellent treatise is that on "Flowers for Suburban Gardens." One of the many beautiful pictures represents a garden

at Hampstead painted with great feeling by Beatrice Parsons and excellently produced, as is her beautiful group of Yuccas and Kniphofias. There is a good index to the work which will prove an acceptable gift book to any garden-lover.

YAPP, R. H. The Dovey Salt Marshes in 1921, in Journ. of Ecology x., 18-23, 1922.

OBITUARIES.

BALFOUR, Sir ISAAC BAYLEY, F.R.S., D.Sc., LL.D. Born at Edinburgh, March 31, 1853; died at Courts Hill, Haslemere, November 30, 1922. He was educated at the Edinburgh Academy and at the Universities of Edinburgh, Strassburg, and Würzburg. In 1874 he accompanied the Transit of Venus Expedition to Rodriguez. In 1879 he was appointed Professor of Botany at Glasgow, and in 1880 he explored the island of Socotra. There he discovered many new species. The King of the island gave him specimens of *Aloe Perryi*, but as it contained little Aloin its commercial value was small. A set of his Socotra plants is at Oxford, where is also preserved his herbarium of Scottish plants, collected when a student. In 1884 he was appointed to the chair of Botany at Oxford, where he soon made his presence felt, the old connection of the Baxters with the Gardens ceasing, the younger Baxter having to leave. The old arrangement of the beds, in which the plants were grouped according to the Linnean system, was changed, not without losing something by it. The changes were made so rapidly that doubtless, if further consideration had been given, the glass-houses might have been relegated to the island across the Cherwell and the Gardens made to resemble more closely what they were in the time of Morison without in any way sacrificing their scientific utility. The collections, also, nearly suffered "re-arrangement." The first intention was to put all the various collections, chiefly of interest as they were from their historic associations, into one general herbarium: a plan which if used

for modern and properly identified specimens is doubtless advantageous. Remonstrance was almost useless. I had no official relation then with the place. But something had to be done to avoid putting the Morisonian and Dillenian collections into chaos, so the Du Bois herbarium was allowed to be cut up—a child thrown to the wolves, and it saved the rest. But he was a great stimulus after Lawson's lethargic regime. He was one of the chief promoters of the "Annals of Botany," of which he was one of the editors from its start. Chiefly owing to his recommendation an honorary M.A. was conferred upon our local bryologist, Mr Henry Boswell. In 1888 he was appointed Professor of Botany at Edinburgh, and King's Botanist and Regius Keeper of the Royal Botanic Gardens, Edinburgh, offices which had been held by his father, John Hutton Balfour, so long known to his students as "Woody Fibre." In the thirty-four years Isaac Balfour held the chair he exerted a wonderful influence. He was ceaselessly active; he made a most beautiful and popular rock-garden; he stimulated collectors to send in their gatherings; he worked out the Rhododendrons and Primulas from China—that inexhaustible storehouse; and he had the various herbarium specimens sent him carefully examined for seeds and in this way succeeded in raising many rare and some new species by his scientific methods of propagation. On our Phyto-geographical Excursion through the British Isles in 1911 he royally entertained us not only with haggis but with many a rare vegetable and fruit, and the foreign members were greatly impressed with the Gardens and collections as well as by the hospitality and the acute observations of the highly accomplished King's Botanist. There was present at this dinner also his charming and only son, a Magdalen College student, who had the ball at his feet, but like so many another of our golden youth died during the great war, leaving a blank in his father's life which was never filled. Professor Balfour was created K.B.E. in 1920, and retired from the offices which he held at Edinburgh at the end of last March. He was a clear and able lecturer, and was one of our greatest systematists. Balfour was a good correspondent, and an able critic. It was at his suggestion that the "Memoir on George Don" was published as a Blue Book, and, in a letter respecting it, he adds that "as a matter of fact I have been accumulating for several years, at odd times,

material for a complete history of the Botanic Garden here which of course includes an account of the lives of the chief members of the staff at different times, and I had, therefore, got together some facts about Don, but my information about him was far less complete than yours. I am able, however, to fix definitely when Don came to the Garden. John Mackay, who was superintendent before Don, died on the 14th of March 1802, and Don must therefore have been appointed after that date. . . . The name of George Don appears in the list of the chemistry class, but not as studying medicine." One of the last letters from him was one saying :—" My dear Doctor, —Thank you for the account of the Herbarium at Oxford. I am very pleased to have it. It is a splendid record. What an advantage it would be if a like account were published of all herbaria! I am sorry to say that the past few years have been so strenuous that I have not done any botanising in Scotland during the period—a great deprivation. I am glad you are continuing to add to our flora and solving problems of what forms really are which have puzzled so many of us in the past."

Bottomley, William Beecroft, Ph.D. Born at Apperley Bridge, Yorks, in 1863; died at Huddersfield, March 24, 1922. He was educated at the Royal Grammar School, Lancaster, and King's College, Cambridge. For some years he was lecturer on biology at St Mary's Hospital Medical School, then a University Extension school. He became Professor of Biology at the Royal Veterinary College, St Pancras, and in 1893, on the retirement of Richard Bentley, Professor of Botany at King's College, a chair he only relinquished, owing to ill-health, in 1921. He contributed several papers to the Royal Society on his researches into nitrogen-fixing organisms for the supply of food to the soil, and he devised a bacterial test for plant food accessories. Other papers treated of "Some Effects of Organic Growth-promoting Substances," and "On the Growth of *Lemna minor* in Mineral Culture Solutions." He also found that he could set free humic acid by the action of certain decomposition bacteria, and from this he hoped to have great practical success in soil treatment.

Boulger, Prof. George Simonds. Born at Bletchingley, Surrey,

in 1853; died suddenly at Richmond, May 4, 1922. He was educated at Wellington and Epsom Colleges, and when quite young became Professor of Natural History at Cirencester, where he was for thirty years. He was also Professor of Botany and Geology at the City of London College, and a lecturer at the Imperial Institute. He was Vice-President of the Selborne Society and of the Gilbert White Fellowship. His most useful work was (in collaboration with Mr J. Britten) *A Biographical Index of British and Irish Botanists.* which ran into two editions and three supplements. He edited Johns' *Flowers of the Field*, which has been a popular help to a wide circle of readers. He also wrote the text for Mrs Henry Perrin's beautiful paintings of *British Flowering Plants* in four volumes, and *The Country, Month by Month*, was a quite pleasing publication, which he wrote in collaboration with J. A. Owen. His *Familiar Trees* ran through two editions. His wife was a delightful writer and, by Professor Boulger's consent, I published the most sympathetic and vivid memorial sketch of the Rev. W. W. Newbould (which was written by her for the *Journal of Botany*) in my *Flora of Berkshire*. Boulger had a fair knowledge of British plants and described a variety of *Erica cinerea* (*Journ. Bot.* 315, 1912) as *schizopetala*, which is a teratological condition rather than a true variety. I had previously recorded it in the same *Journal* (352, 1902) but gave it no name. Professor Boulger's kindness of manner and intelligent interest in science endeared him to a large circle of friends.

Bryce, Viscount James, O.M., G.C.V.O., P.C., D.C.L., LL.D., F.R.S. Born at Belfast, May 10, 1838; died January 22, 1922. His father was headmaster of the High School at Glasgow, and there James was educated. He proceeded to the University and then came to Trinity College, Oxford, where he had a brilliant career, taking a first in Mods and a double-first in Greats, winning the Craven and Vinerian Scholarships, the Gaisford Prize for Greek Verse, and the Arnold Prize for his essay on the Holy Roman Empire —a work which was afterwards translated into several European languages. He was elected a Fellow of Oriel in 1862. In 1867 he was called to the Bar, and became Regius Professor of Civil Law at Oxford in 1870. Not only was he a brilliant scholar, but he was a

great traveller and a skilled mountain climber, a man of untiring energy and with interests numerous and world-spread. He loved the land he travelled over, and much of it was rarely traversed ground, and this he could describe in a very vivid manner. Among his early publications was a graphic account of Transcaucasia and Ararat, written in 1877. This historic peak, the meeting point of three great empires, said to be an extinct volcano, the summit of which is 17,000 feet above sea-level, with perpetual snow at the high level of 14,000 feet due to the small rainfall, is composed of igneous rock. It is graphically described by Bryce, who states that it was first ascended in 1829 by Fredric Parrot. The mountain is exceptionally grand since the massif rises from " a wide sea-like plain " about 2500 feet only above the sea, hence 14,500—the height of the Matterhorn—is in view, and it has no rival in its vicinity. Bryce's companions were left behind at 12,000 feet, and he climbed alone the last 5000 feet—a testimony to his bravery and powers of endurance. On his way at 14,000 feet he saw a species of *Cerastium*. Although he did not find the ark he met with a piece of wood "which might be gopher wood," on which he humorously descants, but some of his readers took it seriously and many made applications for a fragment of the relic, " which as relics go " the argument for its being a piece of the ark is " exceptionally strong." In 1885 he entered Parliament as member for the Tower Hamlets by a large majority, which to some extent was owing to his addressing a meeting of German master-bakers in their own tongue. In after days it was his fate to be the chairman of a small but distinguished committee on alleged German outrages. The report as issued by it was a denunciation of the atrocious action of the German Army in Belgium, and the hope was expressed in it that the nations of the world in council might devise methods to prevent the recurrence of war. In 1888 he issued an important work on the American Commonwealth, which commanded a large circulation in the States. In 1897 he published his *Impressions of South Africa*. In 1907 he became member for South Aberdeen, and in Mr Gladstone's Cabinet of 1892 he was appointed Chancellor of the Duchy of Lancaster. In 1894 he became President of the Board of Trade. In 1905 he was made Chief Secretary for Ireland, an office which he held for two years. Nor was it, as has been in so many instances, the grave of

his reputation. Mr Campbell Bannerman, who may be credited with a great act of statesmanship in his treatment of the South African difficulty, had also the prescience to see that in Bryce no better Ambassador could be found to represent Britain in the United States and thus, without a previous acquaintanceship with diplomacy, Bryce served our country in that important capacity for seven years. His auguries were not of the happiest, but during his residence he conquered America, or rather American sentiment, and was paid the compliment of learning the hidden mysteries of its statecraft, and he acquired an almost unrivalled knowledge of its inner machinery. It is said that he visited every State in the Union, and wherever he went he was welcomed. On almost the last occasion I met him he had come to Oxford as President of the American Club to give an address at the Union, and there for an hour without a written note he explained the relation of the American President to his Foreign Office and showed how much greater was the power of the President in dealing with matters of foreign policy than our own Premier. In this lengthy and well phrased discourse not a word was said which could touch the sensibility of the most thin-skinned of his hearers. Yet at the back of it all one could imagine how, as was the case with Page, he must have girded at the intricate workings of a mind like that possessed by the silver-tongued idealist. President Wilson. To no one more than to Bryce is due the whole-hearted support of the Allies which America eventually gave. After the address one would have thought Lord Bryce would have been tired out. Instead of that he talked to me for a long time on the beauties of the Scottish flora, of the climbs on the Breadalbanes and Cairngorms and his delight at hearing of the additions which had been made in recent times to the Scottish Flora. And Lord Bryce was no mean botanist. One of his earliest contributions to literature was "A Flora of the Isle of Arran," which was published in 1859. When he visited Pekin, Freshfield tells us that the attachés were prepared to answer questions about Chinese politics but were dismayed to find information about the local flora was demanded of them, and this interest in botany was retained to his latest days as an extract from his letters will show. "Though I belong to so many societies that I made a vow two years ago to join no others I cannot resist your persuasions to become a member of the Botanical Society.

The preservation of our rare species is now a matter of the highest consequence. I fear many are extinct. In Clova, four years ago, I failed to find nearly all of the rarer species which were known there in 1855 and fear they may have been destroyed by collectors long ago as *Menziesia* so nearly was. I was shown not long ago a frond of *Cystopteris montana*, stated to have been gathered on Skiddaw within three miles of Keswick. We have an interesting and peculiar flora in this forest [Sussex] of a Cumbrian or West of Scotland character." This latter note was written only last year. In 1912 he made a journey from Panama to Argentina and Brazil by the Straits of Magellan. His account of this forms a most excellent and readable book of travel, full, as it is, of information, and it is also an evidence of his broad and sympathetic judgment. Douglas Freshfield, in his memorial notice in *Nature* (14, 1922), quotes one of Lord Bryce's sentences from this work as an example of his style—" The blue of Titicaca is peculiar, not deep and dark as that of the tropical ocean, nor opaque like the blue-green of Lake Leman, nor like that warm purple of the Ægean which Homer compares to dark red wine, but a clear, cold crystalline blue, even as is that of the cold sky vaulted over it. Even in this blazing sunlight it had that sort of chilly glitter one sees in the crevasses of a glacier; and the wavelets sparkled like diamonds." But Lord Bryce was more than a botanist, or a traveller, or a University scholar: he was a statesman of a high order. Years ago Gladstone gave the Romanes Lecture in Oxford. It was shortly after the death of a Royal Personage. The Sheldonian Theatre was packed with an audience clothed for the most part in black. It was a grim cold day and the light, or such of it as came through the Broad Street windows, was focussed on the dark southern doors, against which, on a rostrum, stood Gladstone dressed in his scarlet robes as D.C.L., with his well cut, almost predacious features, and silvery hair, the one touch of colour in the place. The air outside was frigid. He had, for the most part, a hostile audience to face and his reception was scarcely warmer than the exterior atmosphere. Yet with oratorical skill he elaborated the characteristics of the great Universities—Paris, Cambridge, Oxford—and contrasting the two latter said that Cambridge had been the home of poets—Oxford of statesmen. He mentioned that all the Chancellors of Oxford,

from the Duke of Wellington to Lord Salisbury, had been Premiers of England. This generous allusion to his great opponent melted the ice and he had subjugated his hearers. Lord Bryce adds another to the list of Oxford statesmen who has done inestimable service to his country. He had visited most countries, had met almost everyone worth knowing, and possessed a very wide and deep knowledge of places and peoples, not only from books but from personal observation, and this was recognised not only in his own country but by the Universities of many lands which showered their honours upon him. Not the least of these was the well-earned encomium passed on him by Sir Edward Grey when he alluded to him as 'the great pacificator.' A lover of liberty in the highest sense as Bryce was he necessarily detested strife, and his concept of liberty is magnificently expressed in his sketch of Lord Acton, from which we quote: "Twenty years ago, late at night, he expounded to me his view of how such a history of Liberty might be written, and in what wise it might be made the central thread of all history. He spoke for six or seven minutes only, but he spoke like a man inspired, seeming as if, from some mountain summit high in air, he saw beneath him the far-winding path of human progress from dim Cimmerian shores of prehistoric shadow into the fuller yet broken and fitful light of modern times. The eloquence was splendid, but greater than the eloquence was the penetrating vision which discerned through all events and in all ages the play of those moral forces, now creating, now destroying, always transmuting, which had moulded and remoulded institutions, and had given to the human spirit its ceaselessly-changing forms of energy. It was as if the whole landscape of history had been suddenly lit up by a burst of sunlight. I have never heard from any other lips any discourse like it, nor from his did I ever hear the like again."

CARRUTHERS, WILLIAM, Ph.D., F.R.S. Born in Moffat in 1830, the son of Samuel Carruthers, a merchant there; died at Norwood, June 2, 1922. He was educated at Edinburgh University with the view of entering the Presbyterial ministry, but he took up science as his life work. He joined the Botanical Department of the British Museum on Robert Brown's death in 1869, and became Keeper in 1871. He was President of the Linnean Society, 1886-90, during

its centenary; President of the Royal Microscopical Society, 1900-1, and Consulting Botanist to the Royal Agricultural Society, 1871-1910. He was a member of the Presbyterian Church and formed a considerable collection of works relating to Puritan England. He rendered great service to Agricultural Science by his testing of seeds to determine their germination capacity, and by his work on the vitality of farm and grass seeds.

CODRINGTON, Rev. ROBERT HENRY, D.D. Born at Wroughton, Wilts, September 15, 1830; died at Chichester, September 1922. Noted for his work in Melanesia, of the Mission of which he was the Head. He was a versatile scholar and a man of great natural accomplishments. Although he never published anything on botany he was a great lover of plants and knew much about them. When I saw him last July he was unwell but his mind was clear and his wonderful memory still good. His works on the Melanesian languages and the Melanesians, their anthropology and folk-lore are monumental.

DUTHIE, JOHN FIRMINGER. Born May 12, 1845; died at West Wortling, Sussex, February 23, 1922, aged 76. He was the son of the Rev. A. H. Duthie, Rector of Sittingbourne, and was educated at Marlborough and Jesus College, Cambridge, graduating in 1867. He acted as tutor for a short time and then travelled on the Continent. In 1875 he was appointed Professor of Natural History at Cirencester, and the next year became Superintendent of the Botanic Gardens at Paharanpur where he remained till 1903. He contributed the greater part of the account of the Myrtaceae to the second volume of *The Flora of British India* in 1879. In 1881 he issued *A List of the Grasses of North-Western India*, and in 1886 appeared folio *Illustrations of the Indigenous Fodder Grasses of the Plains of North-Western India*. In the same year he gave an account of a botanical tour in Rajputana, and in 1896 of a botanical tour in Kashmir. In 1903, on his return to England, he was appointed Indian Assistant in the Kew Herbarium, which ill-health caused him, four years later, to resign. He published "The Orchids of the North-Western Himalayas" in 1906 to the *Annals of the Royal Botanic Garden, Calcutta* ix., pt. 1, 173 species being enumerated. He was also engaged in writing a *Flora of the Upper Gangetic Plain*

of which some portions have been printed in Calcutta. Duthie, in 1871, added a new plant to the British Flora—the interesting *Polygala austriaca* from Wye downs, where it still grows. He also added *P. calcarea* to the Oxfordshire flora from Ewelme downs, as recorded in our *Report* for 1870. His name is connected with *Liparis Duthiei* and *Herminium Duthiei*. He acted occasionally as an examiner in our Botanical School at Oxford but, doubtless from ill-health, he always seemed depressed and lacking in vigour.

Elwes, Henry John, F.R.S. Born May 16, 1846; died December 3, 1922. He was the son of J. H. Elwes, of Colesborne Park, and married Margaret, daughter of W. C. Loundes, of Brightwell Park, Oxon. His great-grandfather succeeded to a part of the large wealth of the miser Elwes of Marcham. He was educated at Eton and served five years in the Scots Guards, retiring with the rank of captain. He was a great traveller. He had the travelling spirit and was, I think, most at home when he was exploring. He travelled in Turkey, Asia Minor, Tibet, India, South America, Mexico, Chile, Russia, Siberia, Nepal, Sikhim, China, Japan, and Formosa. His travelling was by no means purposeless: a more purposeful person never existed. Tall and strongly made, he was one of the most virile men I have ever met. In conversation he carried all before him as autumn leaves are blown in a gale. He knew places and things and had strong views on most subjects, and they lost nothing in expression. He was an ardent collector of Lepidoptera, and his magnificent collection was given to the Natural History Museum. A big game hunter, one would not imagine that micro-Lepidoptera were much in his line. He was an enthusiastic horticulturist and a vice-president and Victorian medallist of the Royal Horticultural Society. So long ago as 1877-80 he published an excellent and costly *Monograph of the Lilies* which now commands much more than its published price. In it he describes *L. Handsoni* from Manchuria. In Asia Minor he discovered, in 1875, a magnificent Snowdrop which bears his name. I have had the pleasure of seeing it in its native home. His monumental work, however, was that in which he secured the co-operation of Dr Henry—*The Trees of Great Britain and Ireland*, published between the years 1906 and 1913, on the preparation of which he spent much labour and money.

He visited nearly every important estate in Britain in order to measure or have photographed the special trees growing there. In this occupation his almost volcanic energy found a fitting vent. After a heavy day's work, he was ready to start the next day at 7 or earlier! While engaged on the Trees he came to Oxford to see the Garden trees, but was somewhat contemptuous at what he thought Oxfordshire could show. The Magdalen Elms brought him into a less agnostic mind. I took him to Cornbury where he saw the Great Beech, now, alas, like Elwes, no more, and the big Hornbeam and the fine Service Tree. We also went to see the great Plane at Rycote. He was rather dogmatic about oak-panelling, so I took him to Yarnton, and there Mr Franklin, who has done such excellent oak-work in St Paul's and elsewhere, told him that for beauty of grain he considered the Brigstock Chase Oaks of Northants the best in Britain, and showed panels from them which surprised Elwes. He also showed the best way of cutting the wood in order to more efficiently display the grain. I will not say that Elwes was chastened. That could not happen, but he admitted that his visit was not entirely barren. The book, despite its want of arrangement, supplies a great want, and now commands more than twice the original price. Elwes was President of the Royal English Arboricultural Society and of the Entomological Society. He was also admitted a Fellow of the Royal Society. It will be remembered that he was one of those who stepped into the breach in order to prevent the lapse of the publication of the *Botanical Magazine*. In a previous year Sir Joseph Hooker dedicated a volume to Elwes. I had much correspondence with him, and have printed one or two of his letters to show how keen he was. "Can you help us on a point which British Botanists as a rule have seemingly neglected, and that is the distribution of the two forms, generally looked on by German botanists as species of birch? I cannot call to mind any single English author who seems to have paid due attention to the subject and I do not like taking my facts from Germans as so many others do. The only forester whom I know who seemed to recognise them as distinct was Mr Michie, now the King's factor at Balmoral, and he told me that in that district the *B. verrucosa* was confined to rocky and hard ground, whilst *B. pubescens* grew only on boggy, wet land. This is the case in Germany according to the best authority. But in

most parts of England the two forms seem mixed, and many of the trees seem intermediate in their distinctive character which is much more apparent in the seedling and juvenile stages than when mature. The bark is supposed to be more silvery in *verrucosa*, but the nurserymen who catalogue "Silver Birch" neither know nor care which the seed comes from, and I think the character of the bark depends much more on the soil, climate and age of the tree. Again, in so many parts of England the birch is planted or has sprung from planted trees and I have no doubt that the two hybridise. One finds the majority of trees so mixed that the character is not sufficiently marked to say which form they belong to, and in consequence most local botanists in England have not distinguished them as regards their habitat. If you can refer me to any exact observations I shall be much obliged. Dr Henry has just been appointed Lecturer on Forestry at Cambridge University, and I have no doubt will do a great deal there as he is a very live man, deeply interested in the subject and personally attractive to young men, which, in a lecturer, is a great point. The English Arboricultural Society, of which I am president, meets next week at Cheltenham and has an attractive programme of excursions. Can I tempt you to join?" Again, October 22, 1910—"We are just finishing the Poplars for vol. vi. . . you are quoted (*Scot. Nat.* 248, 1892) for the occurrence of *P. canescens* in West Inverness. Loudon quotes Maculloch that it is the only tree existing in the Isle of Lewis but I suppose that he mistook *P. tremula*. Can you give me further particulars? Watson seemed to agree with Hooker and Bentham that it was only truly native in the southern and eastern counties, but I believe it is native here as I have both sexes on my property in a place where they are not likely to have been planted." Again, April 29, 1916—"I am much obliged for the trouble you have taken with the *Report* and am glad you have reprinted Henry's paper on the Black Poplar, for it is very strange how little this interesting tree has been noticed by British Botanists, and I am afraid it is everywhere becoming scarcer and may become extinct unless planted. I hope that it may be propagated by cuttings for, though inferior in timber-producing quality to the hybrids, it is a very handsome tree when in flower. . . It is very strange how little we know of the life-history of the British Orchids and I think it would be a most interesting study for some

of your readers who have time to note year by year whether they reappear in the same localities; whether they survive after seeding; and how long the seedlings take to flower [I was able to say that *praetermissa* flowered when six years old]. As far as I know no one in England has drawn or described their germination or explained how it is they reappear at long intervals in places where they seem to be extinct. If we can raise the most delicate exotic orchids from seed under glass and hybridise them freely it surely ought to be possible with the British species. You have never paid me your promised visit but I hope you will this summer." He leaves a son, Lieut.-Col. H. C. Elwes, D.S.O., M.V.O.

HAGSTROM, JOHAN OSKAR. Born in Bettna in Sudermania (Södermanland), March 21, 1860; died June 7, 1922. Educated at Ny Koping, he went to the University of Upsala in 1879, entered Holy orders in 1885; did duty at several places, Unite (Kommister), Lysvik in Verinland 1889, and as Vicar in Västra Emtervik. He was the author of Potamogeton in Neuman's *Sveriges Flora* (1901); Potamogetonaceae from Asia (1905); Potamogeton in Lindman's *Svensk Flora* (1918); New Potamogetons in *Bot. Not.* (1908); and the work we know him so well by *Critical Researches on Potamogeton* (1916). No one has contributed so much to the knowledge of the genus, especially in its anatomy, and his splendid work will ever remain a monument to his memory. Not only did he describe many new species but he disentangled many that had been erroneously put together; and he has given the fullest and best account of many species. As an example of good and clear reasoning may be cited his account of *P. panormitanus* Biv. Bern. He did not accept the verdict that it was only a variety but by careful and full analysis showed it was a good species. There is no one at present to take his place. A. BENNETT.

For many years Hagström was engaged in studying the Pondweeds and for this purpose paid especial attention to their anatomical structure. The results are embodied in his very excellent *Critical Researches on Potamogeton* which appeared in the Kungl. Svenska Vetenskapsakademiens Handlingar for 1916, and its excellence was generally acknowledged. Pearsall reviewed it in the *Report*, v., 701. In recognition of these studies the University

of Upsala conferred on him the degree of D.Ph., honoris causa. In December 1920 he wrote about some Pondweeds I had sent him "that they were especially interesting and I wished to write a paragraph on them but I have been ill since that time and am at present still lying sick in bed at an infirmary in Stockholm. Further the Shetland Pondweeds need a thorough elaboration before any one writes on them. You have there some strange forms and I should be very glad if you would be so kind as to again visit the isles next summer, gathering all the other species and forms—for instance, Fryer's *cancellatus*, which I have not seen. Then you would come over to Sweden and stay by me and we should work out the Shetland Potam. Flora. I misdetermined a *pusillus*-like plant which is *panormitanus* instead of *pusillus*. Can you help me to get Perth and Inverness Potamogetons? Wishing you a happy New Year. . . J. O. HAGSTROM." "In returning your pondweeds, with many thanks, I will give a list of the most beautiful and interesting of them. [Most of these have already appeared in the *Report* so only a few are here given.]. *P. filiformis* × *pectinatus*, var. *intermedius*, a new form from Shetland. [This is the *P. vaginatus* of previous workers. So far *vaginatus* is unknown for Britain.]. × *P. franconicus*. Kent, Northants, Berks, etc. *P. rutilus*. Bardister, Tingwall, Shetland, also hybrids. *P. panormitanus*. Norfolk, etc. *P. Sturrockii* [which he thinks is *P. obtusifolius* × *panormitanus*]. Stroud. *P. alpinus* × *gramineus* = *P. nericeus*. River Don, Aberdeen. *P. gramineus* × *natans* = *P. sparganiifolius* Laest. Maam, Galway. [This is the *P. Kirkii* of the *List.*]. *P. gramineus* × *lucens* × *natans* = *P. crassifolius* Fryer. Engine Drive, Camb. Indeed a very beautiful list of which few botanists have the match. Now I hope you will return from Shetland with a rich harvest of Pondweeds, the most interesting of which no doubt will be *rutilus* and its hybrid with *panormitanus*. Your reprints, for which I thank you heartily, I have read with much pleasure. J. O. HAGSTROM." He was especially interested in the Glen Cahir, Clare, "*P. lanceolatus*" which had been named var. *hibernicus*. Hagström thought it was a hybrid of *coloratus* but that plant was then unknown from the Cahir stream. In September 1921, with Mrs Wedgwood, the stream was explored and we succeeded in finding *coloratus*, although small plants, in some plenty with the hybrid,

thus corroborating his brilliant suggestion. The sight of it cheered him on his bed of sickness, as did that of the Shetland *P. polygonifolius*, var. *cancellatus*, which after much difficulty I found and thus proved to him it was not a hybrid but a form of that species. Of the Clare Pondweed he says—" This hybrid which I, ad. int., name *P. perpygmaeus* is undoubtedly the most interesting plant which Ireland owns. The same occurs in Burwell Fen, Camb. I will write a note on it in my new book on the Pondweeds." This was written shortly before he died and was probably his last scientific work. As Mr Bennett (himself an acknowledged authority on the genus) generously says, there is no one to take his place. We all deplore the loss of one of our most respected Honorary Members.

HANCOCK, WILLIAM, F.L.S. Born at Lurgan in 1847; died at Bristol, 1914. He was educated at Lancaster and Queen's College, Belfast. He went out to China as a member of Sir Robert Hunt's Imperial Maritime Customs. There he began collecting plants, assisted by Hance, Canton Maximowicz, of St Petersburg. He became a valued correspondent of Sir Joseph Hooker. On several occasions I had the pleasure of meeting him, when he told me of his various journeys—for he saved up his ' leaves ' until he could have one long enough to visit Central America, the West Indies, as well as Java, Sumatra, and Japan. His Herbarium of about 10,000 specimens was given to Kew by his sister. See Kew Bull. 204, 1922.

HARCOURT, The Right Hon. Viscount LEWIS VERNON, Baron Nuneham, P.C., D.C.L. Born January 31, 1863; died February 24, 1922. He was a son of the late Sir William Vernon Harcourt, and Trustee of the Wallace, British Museum, London Museum, and National Portrait Gallery. Educated at Eton, he acted as Secretary to his father, and entered the House of Commons for the Rossendale Division of Lancashire, which he represented for thirteen years. He was Commissioner of Works and a most efficient Colonial Secretary. Although an able parliamentarian and a successful head of each Government Department to which he was appointed, as he often said " he was a politician by accident, a gardener by inclination," but the statement, one felt, had to be taken with a grain of salt, for had his health been robust there is little doubt that one of the highest, if not the highest, political post might in time have

come to him. The late Lord Spencer once told the House of Commons "that he was not an agricultural labourer," a statement which, coming from such an extremely well-dressed and so aristocratic a young man, sent the members into shrieks of laughter. So too one could scarcely picture such a magnificently arrayed personage as Lord Harcourt as being one who delved; indeed his tall, graceful, well-groomed figure suggested one of the haute noblesse coming from the Boulevard St Germain rather than out of a potting shed, for he inherited some of the physical as well as the mental traits of his ancient lineage. But he loved his garden and knew much about its occupants. It has been my lot to know four owners of Nuneham. It is, or was, a large plain house beautifully situate on the east bank of the Thames. From this high, wooded bank, where Otho Nicholson's Conduit, which once was erected at Carfax, Oxford, stands, a charming view of the spires and towers of that city is obtained. There is a large deer-park and old-fashioned gardens partly laid out by Capability Brown and partly by the poet, Mason. I made the acquaintance of Colonel Harcourt in the eighties when I was preparing the *Flora of Oxfordshire*, for there was a rumour that when Jean Jacques Rousseau, who was on intimate terms with the Lord Chancellor, Earl Harcourt, came to Nuneham he introduced many French flowers into the woods. Of this we failed to obtain any confirmation. However, I was shown Rousseau's copy of Tasso and some papers which were given by his widow to Earl Harcourt. Colonel Harcourt was succeeded by Aubrey Harcourt, of whom it was rumoured that he was in love with one of the Miss Liddells, a daughter of the Dean of Christ Church, and that her untimely death altered his career. He came to me often as a customer and asked, though he did not always take, my advice on many things relating to himself and even to his private affairs. It was a relief to find that on his death (had he lived a few years longer he would have succeeded to the Earldom of Sheffield) he had left his estates in the family, and that Sir William, once member for Oxford, became the owner of Nuneham. It was one of life's ironies that the estate of Nuneham which came to him who had introduced death-duties, should so soon have to bear them again, for Sir William only lived a short time after his succession. Viscount Harcourt, with his excellent taste, added a

parapet to the mansion, thus redeeming its extreme plainness, and by building a stone terrace round the house gave it a dignity befitting its situation. He planted rare creepers on its walls, and covered the stone terraces with Campanulas and rock plants, added a Japanese garden or rather filled a hollow with Japanese trees and made a water-garden, accidentally bringing *Azolla filiculoides* which became a pest. Nuneham became a delightful home to visit and it was always a privilege to go through the grounds with one who really was a flower lover, and had the means and taste to display them without overburdening the scene. I met him for the last time at a Committee at the Speaker's House and he took me in his motor to see Hertford House and to hear an excellent lecture—one of a series he had so wisely initiated—on the furniture of Louis Quinze and Quatorze which in that collection is so splendidly represented. Then all too soon the burying-ground of Nuneham had to receive the remains of its distinguished owner. One instinctively hoped, as one stood by the open grave, that the young boy, so like his father in appearance, might inherit not only his father's genius and kindly courtesy, but might be blessed with health and strength to carry out the duties which lie before him with the same geniality and kindliness.

KIRK, Sir JOHN, G.C.M.G., K.C.B., LL.D., D.C.L., F.R.S. Born at Barry, Forfar, December 19, 1832; died January 15, 1922. Educated at Edinburgh University, which he joined before he was 15, he graduated in 1854 as M.D. He went to the Crimea where he was an assistant surgeon, and in 1857 accompanied Livingstone on the Zambesi mission. He returned in 1863. In 1867 he went as surgeon to the political agency in Zanzibar where, in 1873, he became Agent and Consul. Since 1887 he had been pensioned but was employed on several missions. Until 1911 he was foreign Secretary to the Royal Geographical Society. He contributed many papers to the Linnean Society (see *Proc.* 47, 1922). See also *Kew Bulletin*, no. 2, pp. 49-63.

LINDLEY, Baron NATHANIEL LINDLEY, P.C., F.R.S., D.C.L., etc. Born at Acton Green, the son of the eminent botanist, John Lindley, in 1828; died at East Carleton, Norfolk, December 9, 1921. Lord Lindley was an intimate friend of Sir William and Sir Joseph

Hooker and Bentham and kept up his liking for botany throughout his distinguished career. He inherited his father's rights in the *Gardeners' Chronicle* and took great interest in that deservedly popular publication.

MACKENZIE, OSGOOD H., of Poolewe, Ross-shire. Born, 1842; died at Inverewe, April 15, 1922. He published *A Hundred Years in the Highlands*, which contained many references to Ross-shire plants. His beautiful garden contained many unexpected species until the influence of the Gulf Stream was remembered and the necessarily mild, humid atmosphere.

MONTGOMREY, ARCHIBALD SIM. Born 1844; died April 12, 1922. Mr Montgomrey was a member of a family who have resided in Brentford for over a century, and was well-known and respected for many years as the head of the firm of Montgomrey & Sons, timber merchants, at what is still known as Montgomrey's Wharf, High Street. He married a daughter of Mr John Coward, a minor Canon of St Paul's Cathedral, who died in early life in 1882. Mr Montgomrey was an ardent supporter of many movements in Brentford, and may be regarded as the founder of the Public Library which was first placed at Clifden House. He was one of the first elected members on the Middlesex County Council for Brentford, and served on that body for some years. In 1889 he was appointed to the Commission of the Peace for Middlesex, and later was for several years Deputy-Chairman of the Bench, finally succeeding to the chair. He retired in 1909 when he came to live in Cheltenham. Mr Montgomrey was an enthusiastic botanist and knew the British Flora well. He had a herbarium of flowering plants. H. H. KNIGHT.

In this collection the Water Ranunculi were especially well dried. It has been presented by his sister to the Museum Free Library, Cheltenham.

RYLE, Dr REGINALD JOHN. Born in 1854; died at Guy's Hospital, December 4, 1922. He was the son of Bishop Ryle of Liverpool and brother of Bishop Ryle, Dean of Westminster. He was educated at Repton and Trinity College, Oxford, and pursued his medical career at Guy's Hospital, taking his M.R.C.S. in 1883. He was in medical practice for ten years at Barnet, and then went to Brighton. When there he took his Oxford doctorate in Medicine and was made

a J.P. for that borough. For some time he had been medical adviser at Bradfield College, and only this year added *Veronica triphylla* to the Berkshire flora, but as a garden weed. By his wife, Catherine, daughter of S. K. Scott, of Brighton, he had ten children. His chief medical work was one on *The Origin of Feeble-Mindedness*. His regretted death took place shortly after he had bought a new house at Pangbourne, where he hoped to do local botanical investigation.

VAUGHAN, Canon JOHN. Born, the second son of the Rev. Matthew Vaughan, once Vicar of Finchingfield, January 22, 1855; died at Winchester, July 10, 1922. He was educated at Felsted School and graduated from Christ College, Cambridge, in 1876. He became Curate of Alton in 1881, Vicar of Portchester in 1890, of Landridge in 1897, and Rector of Droxford in 1900. He was a graceful writer and a valued contributor to the *Nineteenth Century*, *Cornhill*, *Saturday Review* and the *Times*. His published works include *Winchester Cathedral Close*; *Winchester Cathedral—Its Monuments and Memorials*; *A Mirror of the Soul* and, on the subject specially within our scope, there may be mentioned *The Flowers of Selborne and Other Papers*; *The Music of Wild Flowers*, and to Dent's County Guides papers on the Isle of Wight and the Botany of Hampshire. His *Lighter Studies of a Country Rector*, a title which suggests that of the work of 'A. K. H. B.,' of which it has the same delicacy of touch, treats of many subjects and gives a charming account of the Suffolk coast and of the Aldeburgh Pea, mentioned by Lobelius. Other chapters equally readable are on "Churchyard Trees," "The Suffolk Shore" and "In the Footsteps of John Ray." The latter describes the expedition of that naturalist with Francis Willughby into Wales. There is a useful chapter on the arid subject of Plant Nomenclature which he has robbed of its dryness. In alluding to the uncertainty about plant names which obtained until the days of the great Linneaus, perhaps he gives to him more than his due, but the paper must be helpful to botanical beginners to whom sometimes the classical name is repellent, if not unmeaning. Excellent, too, are the chapters on the Isle of Wight, an area which he deeply loved. In the *Cornhill* for June, 1916, Canon Vaughan wrote an elegant and appreciative essay on John

Goodyer of Maple Durham, which gave the salient features of that long overlooked but very excellent Hampshire botanist to whom Johnson owed so much in preparing his edition of Gerard's *Herbal*. This again directed my attention to Goodyer, for in preparing the *Flora of Berkshire*, I found that his library was in the Magdalen College Library. Therefore in these pages (*Rep. B.E.C.* 523-550, 1916) I gave an account of his botanical discoveries, his work at the British flora, as well as a list of the books which he bequeathed to Magdalen College Library. Of this Supplement to our *Report* no adequate acknowledgment has been made in a recent work on the subject. Canon Vaughan had a great love for British Botany. He prepared a neat herbarium, mainly of plants collected by himself, and he knew Hampshire and the Isle of Wight intimately. Personally he was a man of great charm. Interested in his subject he could make others also keen, and he instilled into many young Wintonians a love for plant study. He was also a pleasing and successful lecturer. My first introduction to him was when I was on one of many visits to Mill House (close to the picturesque Hospital of St Cross), then the home of the member for the City, Major the Hon. Guy Baring. From this time a friendship grew up which lasted till the end. He took us to the Cathedral Library to show the copy of Leonard Fuchs' *Historia* which formed the subject of one of his notes, and under his guidance, and what better one could have been found, we saw the new window to the memory of Izaak Walton, with its view of Dovedale and the Itchen, and its fisher Saints and then we paid our reverence to the Chantries of Waynflete, William of Wykeham, and Fox, the founders respectively of Magdalen, New and Corpus Christi Colleges, Oxford. He also showed me where *Aceras* grew in a spot which owing to the necessities of the great war now knows it no more. Nor is that the only loss from that cause which one feels whenever one revisits that city of ancient memories. I see a photograph taken in those happy days by my kind host of a group on the lawn when, of the three boys sitting at our feet, two, the handsome Lord Weymouth, with all his mother's beauty, who was killed ere life's summer had begun, and young Fellowes, whom I had known as a small boy playing Red Indians in the glades of Wychwood. And I have been privileged to see the letter written to his parents just before he went into

battle, with all consciousness of his doom and yet with all that gallant bravery—the characteristic of his race. Surely he reached heaven's gate through the portals of fiery pain. And that bravery, too, was the guerdon of his, the taker of the picture, who was shot at Mons as he led the Coldstreams into action as their Colonel, and whose courage was extolled to me in a railway carriage by a private soldier, who little knew he was talking to one who had been his friend. The sorrow of missing these is compensated in some measure by the pride one has in knowing how they died. Last year I saw Canon Vaughan in his beautiful home with its spacious garden thronged with flowers which he knew and loved, close to that stately Cathedral to which he belonged and to which he gave the devotion which was its meed. At that time he had developed a weak heart and was ordered to go slowly. This meant relinquishing his lectures, a great blow, since for many years he had been a most popular lecturer to the Church Reading Union. But, as I told him, he retained the use of his pen which would reach still larger circles, and to this enforced leisure are due some of those beautiful contributions which were a conspicuous feature in the *Times*. This summer I missed seeing him, for when he and Sir Rickman Godlee, a nephew of Lord Lister, with whom he had been staying, and who had showed him that great rarity, the Monkey Orchid, called on me I was away in Holland. On July 9 after he had been preaching in the Cathedral on the centenary of Richard Martin, and was proceeding to administer the Holy Communion heart-failure came on and shortly after his removal to his home he passed peacefully away. He leaves behind a fragrant memory of a gifted and urbane scholar and a gentle and kindly soul which will not readily fade from the minds of those who had the privilege of his acquaintanceship. He was married to the daughter of the Rev. F. Whyley, Vicar of Alton, who, with two daughters, survives him.

A correspondent writes:—"The sudden death of Canon Vaughan has left the Church, and especially the Diocese of Winchester, the poorer for the loss of a devoted minister, and has deprived science of one of her most enthusiastic adherents. Of Canon Vaughan's work as a Churchman it is no place here to speak: suffice it to say that, after taking his degree at Cambridge he passed the whole of his ministerial

career in the same diocese, from his first curacy at Portchester, through many years as Rector of Droxford till its culmination in a Canonry at Winchester, to which he was, in 1910, appointed in well-deserved recognition of his long and faithful service by Bishop Ryle. His scientific interests were two-fold, a mingling of the claims of archaeology and of botany which resulted in many charming articles. In particular the writer calls to mind several which he afterwards collected into two volumes entitled *The Wild Flowers of Selborne* and *The Lighter Studies of a Country Rector*. In these two books Canon Vaughan is seen at his best: his delicate touch and graceful style were combined with the keenest observation, yet neither gift was allowed to mar the other. Every essay, therefore, was in itself a perfect piece of work, delightful alike to the reader of literary tastes as to the driest of specialists, whether it dealt with the flowers growing on the walls of Winchester Cathedral, the use of pot-herbs and simples in olden times, the flora of his own country or the habits of birds. Although his interests undoubtedly lay primarily in the ways of nature, it was equally proper for him to pass backwards from the habits of birds and flowers to the lives and occupations of the early British naturalists, Gilbert White, George Crabbe, and many another, and through them to archaeology. But other strains in Canon Vaughan's character also led to the same end. His profound sympathy with his own contemporaries and his intense local patriotism alike guided him along the same path. To this spirit were due papers on a former Countess of Warwick, on Izaak Walton, on the French prisoners of Porchester, the old documents of his parish, and a long-forgotten burial ground. This side of his character attained its fullest realisation when he came to reside in the Close, in a historic house to which was attached a beautiful garden with a stream running through it. Here, in his study, overlooking his flowers, he composed much of his best work, notably a series of articles on birds and flowers for which the writer used eagerly to scan the columns of the *Times* and which only the author's inimitable style betrayed, since all were unsigned, and a series of papers which were later published in *Winchester Cathedral Close* and *Winchester Cathedral*. The latter work is replete with historical information on the monuments, the treasures, and the bye-

gone worthies of the Cathedral which he loved so well. There, too, his knowledge, not merely theoretical, was of practical use, for it was, the present writer believes, largely due to Canon Vaughan that the disjoined fragments of Bishop Andemar's long-dishonoured monument were once again brought together and restored to their original position. All these pursuits and interests, however, serve but to emphasise the outstanding feature of Canon Vaughan's character, his unfailing sympathy with others and his readiness to help. He was never happier than when so engaged, were it in comforting the afflicted, preaching and lecturing far and wide in the diocese, showing the Cathedral to visitors or initiating those many years younger than himself into the secrets of nature. The writer well remembers a day spent with Canon Vaughan in searching for the " Man Orchid " on the downs in the Isle of Wight, and the joy with which a specimen of this rare plant was brought home in triumph. Not a few scholars of Winchester College, like him, enjoyed on Sundays the delightful hospitality of Canon Vaughan and his family and learned from their host a love of the past as well as of birds and flowers."

WOODRUFFE-PEACOCK, Rev. EDWARD ADRIAN. Born at Bottesford Manor, near Brigg, July 23, 1858; died at Grayingham Rectory, February 3, 1922. Educated under Dr Clyde at the Edinburgh Academy, he entered St John's, Cambridge, and proceeded to Bishop Hatfield's Hall, Durham, where in 1880 he took the L.Th. After filling many curacies, in 1891 he became Vicar of Cadney, and in 1920 Rector of Grayingham. The eldest son of a distinguished antiquarian and student he had no distinct recollection when he began geology and botany. He was bred in the open country round Bottesford Manor where there was a library of 12,000 books. He was taken on his earliest natural history rambles when he was only three years of age. He could distinctly remember when, five years of age, he was taken to West Brumby Common where he saw the Ling and the Cranberry, the last of which has now disappeared. There too he had the first glimpse of the vivid blue of *Gentiana Pneumonanthe*. We once compared notes on early memories. My recollections go back to 1854 when I remember the White Water Lilies of the Ouse and still bear the scar of a scratch I

got in gathering *Geranium pratense* in a hedge, to which, 20 years later, I went to gather it again. What fixed itself on his mind on that day was the great viaduct of the then unfinished Central railway and seeing the insect galls on the branches of the Creeping Willow, which his father cut open to show him the larva. Rocks, fossils, shells and Lepidoptera were all collected with great eagerness, his mother encouraging his bent to the full. Birds and fish, too, were not neglected. He was one of the founders of the Lincolnshire Naturalists' Union and one of its chief workers, being President in 1905-6. His herbarium is one of the wonders of the Museum. For many years he had been most actively engaged in studying the field botany of Lincolnshire, and his work from an ecological standpoint is amongst the best of its kind, although on somewhat different lines from that usually followed. He was an extremely close observer and an indefatigable note-taker. He once frightened me by sending me his notes on *Sambucus nigra* and other common plants. They appalled one by their volume and one felt one could not see the wood for the trees. In 1909 he published a *Check-List of Lincolnshire Plants*; an analysis of 500,000 observations. He joined our Society in 1910 and contributed to our *Reports*. See an interesting note on a hybrid *Bidens*, v., 33, and on p. 359, 1912, he has a note on *Sieglingia decumbens*, which shows the painstaking way he dealt with the Lincoln species. He notes that it grows in ten out of the eighteen divisions but always under given conditions. The heath-peat must be limeless. On it he had 106 notes with exact soils. Wild ducks are specially fond of the seeds, and when a duck feeding on it is shot more or less of the seed may be found on its back. Thus it is spread, as also by the circular storms and whirlwinds. There are also vivid papers of his on *Capsella* and *Malva sylvestris*, the latter he thought certainly native in Lincolnshire. He suggested that *Rumex maritimus* and *limosus* are seasonal forms but the evidence he cites is not conclusive. (See *Journ. Bot.* 348, 1911.) He was also a contributor to *Science Gossip*, *The Naturalist*, &c. His voluminous notes have been left to Cambridge University Library, his library, herbarium and specimens to the Lincoln County Museum and Library. He was one of my most valued correspondents. Below is a slightly abridged account of our valued member which appeared in the *Transactions of the Lincolnshire Naturalists' Union* :—

Mr Peacock was a man of many attainments and activities, but he was best known as a capable and experienced field naturalist. He will be greatly missed, particularly by those who are interested in the natural history of Lincolnshire, for he accomplished probably more than any other single worker in the accumulation of facts relating to the distribution of plants and animals in the county in which he was born, and in which he spent the greater part of his life. He was one of the founders of the Lincolnshire Naturalists' Union in 1893; for ten years he was its Organising Secretary; he was its President in 1905-6; during the entire period of its existence he has been its moving spirit, and he was once aptly described by the late Canon William Fowler as its "nursing father." He was an all-round naturalist. Full of enthusiasm himself, he inspired enthusiasm in others, and he was ever ready to help and encourage fellow-workers and junior students. From his youth up he was an indefatigable observer and note-taker—"a humble recorder of trifling everyday facts" is the description he gave of himself in the preface to his *Check-List of Lincolnshire Plants*, published in 1909.

Phanerogamic Botany was his special study, and he devoted the leisure of many years to the compilation of a Flora on ecological lines. Mr A. G. Tansley, F.R.S., of Cambridge, was so much impressed by a perusal of the MS. of this Flora that he offered to bear the expense of its publication. "It carries out," he wrote, "the centre thought of ecology. You go for twenty or thirty years to work the same bit of ground annually to discover its changes. As you are willing to sacrifice any time to get at the facts, you have discovered the obscure laws lying behind them." This offer was a great encouragement to Mr Peacock who, so long as health permitted, was engaged in making a final revision of his MS. for the press.

Mr Peacock was thorough in everything he undertook. In his preaching he always made it his aim to get a series of correlated ideas for every address, and he then endeavoured to give expression to his thoughts in plain, simple, forcible language.

He contributed many articles on natural history topics to scientific journals and to the Press, and he wrote a number of pamphlets on the relations of particular grasses to particular soils. He is survived by a widow and three sons. R. W. GOULDING.

NEW COUNTY AND OTHER RECORDS.

ABBREVIATIONS.—*Rep. B.E.C.* = *Report of the Botanical Society and Exchange Club*; *Wats. B.E.C.* = *Report of Watson Botanical Exchange Club*; †=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 means that the plant is a hybrid; 52, &c., numbers following a county, refer to the Watsonian vice-county in *Topographical Botany*; [ ] enclosing a record mean that confirmatory evidence is needed.

† 1 (3). CLEMATIS VITICELLA L. Bank of Thames, near Hampton Court, Middlesex, 1922, BRITTON. Suggested to have been water-borne from Esher, Surrey. See *Rep. B.E.C.* 7, 1914.

9. ANEMONE NEMOROSA L. Growing, at 1000 ft., with *Ranunculus Ficaria* amid last year's *Molinia* on boggy land (sphagnous) on the open mountain below the Bwlch-y-Clawdd, on Myneydd, WILLIAM MEYRICK. *R. Ficaria* had small, narrow, almost linear petals. WEBB.

†11. A. APENNINA L. Hedgebank by the side of the road through Mr Lloyd Græme's Park to Danes Dyke, E. Yorks, FLINTOFF.

†16. ADONIS ANNUA L. Colchester, BROWN.

17. MYOSURUS MINIMUS L. Fields in Hayling Island, common, Miss HILLARD & DRUCE.

18. RANUNCULUS FLABELLATUS Desf. Corbière, &c., Jersey, Lady DAVY.

21. R. AURICOMUS L. Fyvie, N. Aberdeen, Rev. F. TURREFF.

23. R. LINGUA L. E. Gloster, RIDDELSDELL.

36. R. FLUITANS Lam. In Burry Pill, Llangenydd, Glamorgan, WEBB.

40. R. HETEROPHYLLUS Web. Mountfield, Sussex, H. L. GREEN.

45. R. LENORMANDI F. Schultz. Carnedd Dafydd, Carnarvon, at 2700 ft., an extension of its known altitude by 700 ft., DRUCE.

46. R. HEDERACEUS L. A robust form at Buxton, Derby, FLINTOFF.

†*68. ACONITUM NAPELLUS L. Walcot, Oxon, in considerable quantity, a relic of the 17th century garden of the Jenkinson's. Showed me by G. HAYNES and Mrs ETHERINGTON.

†71. PÆONIA OFFICINALIS L. Cornbury Park, Oxon, a solitary, probably bird-sown specimen, from Lady Margaret Watmey's garden. Found on Nat. Hist. Soc. Expedition by Miss STONE.

†79. PAPAVER SOMNIFERUM L. Cannock Chase, Staffs, Sir ROGER CURTIS & DRUCE; Bullingdon Quarries, Oxford, DRUCE.

80. P. RHŒAS L., var. CAUDATIFOLIUM (Jord.). Hertford, DRUCE.

82. P. LECOQUI Lam. Great Hallingbury, N. Essex, BROWN.

†90. GLAUCIUM CORNICULATUM Curt., var. PHOENICEUM (Cr.). Hythe Quay, Colchester, BROWN.

†96. HYPECOUM PENDULUM L. With above, Colchester, BROWN.

†*98 (2). CAPNORCHIS CANADENSIS (DC.) mihi. *Dicentra canadensis* Walp. Roadside near Lamplugh Station, Cumberland, TEMPLEMAN.

†99. CAPNOIDES CAVA Moench. Stow Easton, N. Somerset, Miss I. M. ROPER.

†100. C. SOLIDA Moench. Walcot, Oxon, Mrs ETHERINGTON & DRUCE.

102. C. CLAVICULATA Druce. Leochel Manse, N. Aberdeen, at 1830 feet, a considerable extension of its altitudinal range, W. WILSON.

107. FUMARIA BORAEI Jord. Yearning, Northumberland, A. H. EVANS.

111. F. OFFICINALIS L., var. GRACILIS Pugsl. Axbridge, N. Somerset, Miss TODD.

†116. MATHIOLA INCANA Br. Seedlings. Blackpill, Glamorgan, WEBB.

124. RADICULA SYLVESTRIS Druce. *Dundee, Forfar, 1921, DRUCE; Radyr, Glamorgan, SMITH; Carmarthen, HAMER.

142. CARDAMINE PRATENSIS L., flore pleno. Common round Bury Gower, Glamorgan, WEBB; a double form, with orange sepals and bright lilac petals, Aymestrey, Hereford, DALTRY.

†157. ALYSSUM INCANUM L. Leckwith, Glamorgan, SMITH; Borth, Cardigan, Mrs DEBENHAM; Eriswell, N. Suffolk, CLARKE.

162. DRABA MURALIS L. On old wall, in Forest of Dean, Gloucester, HAINES.

†185. SISYMBRIUM ORIENTALE L. South Stoke, Oxon, DRUCE.

†191. S. POLYCERATUM L. Bristol, Mrs SANDWITH.

†*200. CONRINGIA ORIENTALIS Dum. Drayton, E. Norfolk, CLARKE.

†*211. BRASSICA CHEIRANTHOS Vill. Welbeck, Notts, known for 12 years, GOULDING.

†224. B. INCANA Schultz. Hull, Miss M. COBBE.

†228. ERUCA SATIVA Mill. Hull, Miss M. COBBE.

232. BURSA PASTORIS Weber. Under this the following microspecies have been named by Dr Almquist.

*B. GALLICA (At.) c.n. Narborough, Leicester [Ref. No. B.1], HORWOOD. See *Rep. B.E.C.* 323, 1915. It was sent as *stenocarpa-lyrata*. Also from Bletchingdon, Oxon, DRUCE.

*B. TREVIRORUM (At.) c.n. Newport, Isle of Wight, STRATTON, in *Hb. Druce*; Buildwas Abbey, Salop; Lichfield, Staffs; Roade, Northants; Arbroath, Forfar, DRUCE.

*B. GERMANICA (At.) c.n. Newport, Isle of Wight, STRATTON, *l.c.*; South Stoke, Oxon, DRUCE; Narborough, Leicester, as *densifolia*, HORWOOD.

*B. VIMINALIS (At.) c.n. Pan, Isle of Wight, STRATTON, *l.c.*

*B. RHENANA (At.) c.n. Usk, Monmouth, LEY, in *Hb. Druce*.

*B. LAEVIGATA (At.) Druce. Carmarthen, HAMER.

†235. LEPIDIUM GRAMINIFOLIUM L. Barry, Glamorgan, SMITH.

236. L. LATIFOLIUM L. Growing in great profusion, native, on both sides of the Taff, near Cardiff, on tidal-mud, associated with *Aster Tripolium*, *Plantago maritima*, var. *latifolia* Syme, etc. The colony, consisting of thousands of plants, stretches for about a quarter of a mile along the edge of the tidal mud. It is near allotments but it also occurs in profusion higher up the river where there are no allotments and also on the opposite river bank. The occurrence substantiates an old record referred to by Mr Riddelsdell as dating from 1840-50 in Motley's herbarium. The earliest record for Glamorgan is in *Phyt.* 1848. Storrie (*Flora Cardiff*) gives St Donat's as a Glamorgan locality but this needs confirmation. For many years it has been known to exist on a railway bank between Cardiff and Penarth where it has been thought to be alien. The plant was distributed by A. E. WADE. See *Rep. B.E.C.* 214, 1920, Miss E. VACHELL.

†239. L. PERFOLIATUM L. Drayton, E. Norfolk, CLARKE; Cardiff, SMITH.

†240 (2). L. NEGLECTUM Thell. Colchester, BROWN.

†247. L. VIRGINICUM L. Claddagh, Galway, Mrs EVANS; Knaphill, Winchester, Miss TODD; Ware, Herts, A. E. GRAVESON; Drayton. E. Norfolk, CLARKE.

249. THLASPI ARVENSE L. Galway, Mrs EVANS.

250. T. PERFOLIATUM L. Snowhill, unusually common this year; Cutsdean, Worcester, HAINES.

†253. IBERIS UMBELLATA L. Cannock Chase, Staffs, Sir R. CURTIS & DRUCE.

254. TEESDALEA NUDICAULIS Br. A robust form, Hartlebury Forest, Worcester, Miss A. WILKINSON.

264. CRAMBE MARITIMA L. In some plenty, shore north of Parton, Cumberland, TEMPLEMAN.

†268. RAPISTRUM RUGOSUM All. Tanneries, Hull, Miss M. COBBE.

†281. RESEDA ALBA L. Radyr, Glamorgan, sometimes with six sepals, SMITH.

†282. R. PHYTEUMA L. Cardiff, SMITH.

284. R. LUTEA L. (as var. LECOQUI). Railway, Brislington, N. Somerset, Miss I. M. ROPER. Det. A. THELLUNG.

293. VIOLA SILVESTRIS Kit., var. PUNCTATA Druce. Headley Wood, E. Sussex, RICHARDS; Whittlebury Forest, Northants; Whaddon, Bucks, DRUCE.

294. V. RIVINIANA Reichb., var. DIVERSA Greg. Carnedd Dafydd, Carnarvon, DRUCE. Mrs Gregory now refers the *V. rupestris* of Mr J. E. Little (*Rep. B.E.C.* 374, 1921) from Langley, Herts, to *V. Riviniana* × *rupestris*.

297. V. LACTEA Sm., var. PUMILIFORMIS. Llanishen, Glamorgan, with V. LACTEA × RIVINIANA, RICHARDS.

299. V. HIRTA L., var. FOUDRASII R. & F. Speeton, between Brislington and Filey, E. Yorks, FLINTOFF. Forma ALBA. Headley Heath, Surrey, RICHARDS. Var. PROPERA (Jord.). Headley Wood, Surrey, RICHARDS. Var. OENOCHROA Gillot. Headley Heath, Sur-

rey, RICHARDS. Var. INCONCINNA J. Briq. Chandler's Cross, Herts, RICHARDS. × ODORATA. Chandler's Cross, Herts, RICHARDS (COLLINA); Bottom Wood, Madehurst, W. Sussex, Mrs WEDGWOOD.

310. POLYGALA DUBIUM Bellynck. Wallasey, Cheshire, C. BAILEY.

325. TUNICA PROLIFERA Scop. Still at Hythe, Kent, Miss MURRAY.

†327. GYPSOPHILA PORRIGENS Boiss. Abbey Wood, W. Kent, POORE & ST J. MARRIOTT.

†328. G. PANICULATA L. Bullingdon, Oxon, DRUCE.

†341. SILENE DICHOTOMA Ehrh. Gloster Docks, GAMBIER-PARRY; Louth, Lincoln, LANDON; Aintree, Lancs, WHELDON; Glasgow, GRIERSON.

343. S. ANGLICA L. Pembrey, Carmarthen, HAMER; in plenty between Kennetston and Druids Stone, Glamorgan, WEBB.

†344. S. QUINQUEVULNERA L. Near Edenbridge, Kent, TALBOT.

360. LYCHNIS DIOICA L. × ALBA. Every intermediate, with both parents, Berwick Bridge, Northumberland, A. H. EVANS.

362. L. ALPINA L. With white flowers at Hobcarten, Cumberland, TEMPLEMAN.

370. CERASTIUM VULGATUM L., var. ALPINUM Grenier. On the Slioch, W. Ross, Miss CATOR & G. TALBOT. Exceptionally large flowers suggesting a cross with *alpinum*, but Mr Talbot tells me he did not see *alpinum* on the mountain.

*372. C. PUMILUM Curt. On a dry bank, Colwyn Bay, Denbigh, in the lane that passes Pwllycrochan Woods, May 1909, DALTRY. This is the earliest Welsh record.

*380. STELLARIA NEGLECTA Weihe, var. UMBROSA (O. & R.). Marshfield, Monmouth, WADE.

381. S. HOLOSTEA L. A form with unnotched petals noticed for years at Birdlip, Gloster, HAINES. Near Bysouth Farm, Penrice, Glamorgan, WEBB.

392. ARENARIA LEPTOCLADOS Guss. Lamplugh, Cumberland, TEMPLEMAN.

†418. CLAYTONIA SIBIRICA L. Lower Eskdale, PICKARD; Branthwaite, Cumberland, with pink, and Gilgarrow, Cumberland, with white flowers, TEMPLEMAN.

424. ELATINE HEXANDRA DC., var. SESSILIS Druce. Worplesdon Common, Surrey, BIDDISCOMBE.

425. HYPERICUM ANDROSAEMUM L. Great Bedwyn, Wilts, HURST.

†443. ALTHAEA HIRSUTA L. In great quantity near Headington, Oxon, in a fallow field, bordering woodland, discovered in June 1922 by F. J. WALL, and in August by T. GAMBIER-PARRY. It continued in flower till November. Its occurrence is probably due to pig corn or pheasant food. It was not there in 1910.

448. LAVATERA PUNCTATA All. Between Truro and Malpas, Cornwall, Miss TODD.

451. MALVA MOSCHATA L., var. INTEGRIFOLIA L. & C. Near Dunsford, about 7 miles from Exeter, Miss TODD. Det. A. THELLUNG. It is less extreme than my Berkshire plant. Mr E. G. Baker says it matches "the Alcea folio rotundo laciniato C.B.P." in *Herb. Brit. Mus.* Var. ALBA. Near Bridge-of-Allan, Stirling, Miss G. A. YOUNG. There probably of hortal origin.

459. SIDA CORDIFOLIA L. Oil works, Hull, Miss M. COBBE.

461. HIBISCUS TRIONUM L. Herb. Cardiff, from the Docks.

474. GERANIUM SANGUINEUM L., var. LANCASTRIENSE (Mill.). A pale-flowered, prostrate plant which was found by Mr TEMPLEMAN at Seascale, Cumberland, is very closely allied to, if not identical with, this.

†479. G. PHAEUM L. Quite naturalised nine miles east of Carmarthen with no houses near, HAMER.

479 (2). G. ENDRESSI Gay. Quite naturalised near Patshull, Staffs, where it has been known for some years, Countess DARTMOUTH & DRUCE; near Tenby, Pembroke, ARNETT.

481. G. PYRENAICUM Burm. f. A procumbent form near Bristol, MAHOOD.

484. G. MOLLE L., var. AEQUALE Bab. Tiverton, Devon, MAHOOD.

494. ERODIUM MOSCHATUM Ait. Bishopston Valley, Glamorgan, WEBB.

497. E. NEGLECTUM Bak. & Salmon. Wallasey sand-dunes, Cheshire, 1892; Hightown, S. Lancs, 1918; St Anne's, W. Lancs, WHELDON.

497. E. LEBELII Jord. Broad Sands, S. Devon, 1920, WOLLEY-DOD.

497. E. GLUTINOSUM Dum. Point of Ayre, Isle of Man, 1917, WHELDON.

497. E. PIMPINELLIFOLIUM Sibth. Abbey Wood, W. Kent, ST J. MARRIOTT.

†500. TROPAEOLUM PEREGRINUM L. Glasgow, GRIERSON.

504. OXALIS ACETOSELLA L., var. SUBPURPURASCENS DC. Stanah Gill, Cumberland, TEMPLEMAN.

†506. O. STRICTA L. Garden ground, Langley, Bucks, GWATKIN.

†507. O. CORYMBOSA DC. and 508. O. VIOLACEA L. Hortal. Camden and Clapham, REDGROVE.

†511. IMPATIENS BIFLORA Walt. Tredegar Park, Monmouth, WADE.

†512. I. PARVIFLORA DC. Bridgnorth, Salop, DRUCE.

*539. ULEX NANUS Forst. Plemont, Jersey, 1859, PIQUET. Not seen in Jersey by Lester-Garland.

*547. TRIGONELLA ORNITHOPODIOIDES DC. Sea-wall, Rumney, Monmouth, WADE.

†548. T. FOENUM-GRAECUM L. Hull, Miss A. B. COBBE.

†551. T. MONSPELIACA L. Cardiff Docks.

†*562. MEDICAGO FALCATA L. L'Ancresse, Guernsey, BOLTON KING. †Var. TENUIFOLIOLATA Vuyck. Sleaford, Lincoln, LANDON; Thetford, Norfolk, Lady D. FITZROY; Dumbarton Oil-works, GRIERSON.

†569. M. SOLEIROLII Duby, teste Thellung. Leith, Midlothian, FRASER.

†575. M. MUREX Willd., var. ACULEATA Urb., teste Thellung. Glasgow, GRIERSON.

†579. M. HISPIDA DC., var. PENTACYCLA DC., teste Thellung. Leith, FRASER. †Var. CONFINIS Burnat. Dry Sandford, Berks, GAMBIER-PARRY.

†581. M. MINIMA Desr., var. RECTA Burnat, teste Thellung. Meanwood, Leeds, DRUCE.

†582. M. LACINIATA Mill. Hull, Miss M. COBBE. Var. BREVISPINA Reut. Colchester, BROWN.

†584. M. CILIARIS All. Cardiff Docks.

586. M. LUPULINA L., var. WILLDENOWIANA Koch. Hull, Miss M. COBBE.

†590. MELILOTUS MESSANENSIS All. Cardiff Docks.

†592. M. SULCATA Desv. Radyr, Glamorgan, SMITH.

†605. TRIFOLIUM LAPPACEUM L. Cardiff Docks.

†606. T. ANGUSTIFOLIUM L. Radyr, Glamorgan, SMITH.

†610. T. STELLATUM L. Penarth, Glamorgan, THOMAS. Seeds of this, we hear, have recently been sown on shingle at Camber, Sussex.

†622. T. RESUPINATUM L. Riddings, Coatbridge, Lanark, GRIERSON.

628. T. REPENS L., var. PHYLLANTHUM Ser. Cardiff Docks.

†630. T. NIGRESCENS Viv. Radyr, Glamorgan, SMITH.

632. T. GLOMERATUM L. With above. ? adventive, SMITH.

641. ANTHYLLIS VULNERARIA L., var. BICOLOR Druce. Exmouth, Devon, A. H. EVANS.

†644. LOTUS TETRAGONOLOBUS L. Cardiff Docks.

†651. GALEGA OFFICINALIS L. Barry, Glamorgan, SMITH; Penarth, Glamorgan, *Hb. Cardiff*.

†665. SCORPIURUS SUBVILLOSA L. Radyr, Glamorgan, SMITH; Cardiff, Glamorgan, WADE.

†666. CORONILLA VARIA L. Near Aberdovey, Cardigan, Mrs DEBENHAM; Aigburth, Lancs, BAILEY.

669. ORNITHOPUS PERPUSILLUS L. Gatehouse of Fleet, Kirkcudbright, Lady ELPHINSTONE; Patshull, Staffs, Lady JOAN LEGGE.

†672. HIPPOCREPIS UNISILIQUOSA L. Radyr, Glamorgan, SMITH.

†*673. ONOBRYCHIS VICIIFOLIUS Scop. Carmarthen, HAMER; Barry, Glamorgan, SMITH.

*680. VICIA OROBUS DC. Pontypool, Monmouth, A. M'KENZIE.

†681. V. VILLOSA Roth. Radyr, Glamorgan, SMITH.

†683. V. DASYCARPA Ten. Acton, Middlesex, Mrs WEDGWOOD. To this also Dr Thellung refers the Barry, Glamorgan, specimen sent to the Club in 1920 by the Dept. of Botany, N.H. Mus. Wales, as *V. Cracca*, f. This was also the view of Mr Wheldon.

688. V. SEPIUM L., var. OCHROLEUCA Bast. Wymondham gravel-pit, Norfolk, Mrs POMEROY.

691. V. LUTEA L. Near Corbière, Jersey, 1922, Lady DAVY. This is a new station in the island, one in which the plant is assuredly native. Mr Lester Garland was suspicious of its indigenity at Mont Orgeuil.

†711. LATHYRUS TUBEROSUS L. Near Cirencester, Gloster, Lady DOUIE.

†727. L. ODORATUS L. Near Aldbourne, Sussex. Miss Trower told me of this years ago. It is naturalised in a hedge bordering a ploughed field and has been known for over 50 years. In 1922 the Countess Buxton took me to the place but the flowers had then mostly been picked. Its sequence in the *Plant List*, following Nyman, should be 708.

731. PISUM ARVENSE L. Pond side, Naworth, Cumberland, Countess CARLISLE & Miss BODLEY.

*763. RUBUS CARPINIFOLIUS W. & N. Middlewick, N. Essex, BROWN.

769. R. BAKERI Lees. Bar Hill Wood, Madeley, Staffs, DALTRY.

*778. R. SELMERI Lindeb. Layer-de-la-Haye, N. Essex, BROWN.

779. R. CALVATUS Blox. Great Bromley; Dedham Heath, N. Essex, BROWN.

787. R. PUBESCENS Weihe, var. SUBINERMIS Rogers. Leavenheath, W. Suffolk; BROWN.

798. R. HIRTIFOLIUS P.J.M. & W., var. DANICUS (Focke). Madeley, Staffs, DALTRY. Var. MOLLISSIMUS (Rogers). Old Manor Lane, Madeley, Staffs, DALTRY.

805. R. CRINIGER Linton. Galley Wood Common, S. Essex, Mrs WEDGWOOD & BROWN.

811. R. GELERTII Frid. Dedham Heath; Little Bromley, N. Essex, BROWN.

814. R. VESTITIFORMIS Rogers. Elmstead, N. Essex, BROWN.

817. R. FURVICOLOR Focke (MELANOXYLON Rogers). Bar Hill Wood, Madeley, Staffs, DALTRY; *near this, Brodie, Nairn, DRUCE.

*818. R. INFESTUS Weihe, var. VIRGULTORUM (Ley). Shotover, Oxford, DRUCE. Det. H. J. RIDDELSDELL. An interesting extension of the range of this pretty bramble which is distributed this year.

822. R. LEYANUS Rogers. Madeley, Staffs, DALTRY.

830 (2). R. BLOXAMIANUS Colem. Layer-de-la-Haye, N. Essex, BROWN.

832. R. FUSCICORTEX Sudre (PODOPHYLLUS Rogers). Stratford St Mary, E. Suffolk, BROWN; Bar Hill Wood, Madeley, Staffs, DALTRY.

844. R. PALLIDUS W. & N., var. LEPTOPETALUS Rogers. Madeley, Staffs, DALTRY.

850. R. HYSTRIX W. & N. Wivenhoe, N. Essex, BROWN.

852. R. MURRAYI Sudre (ADORNATUS Rogers, non P.J.M.). Tiptree Heath, N. Essex, BROWN.

876. R. CAESIUS L. A pretty ternate-leaved form near Farnham, ? Surrey, BIDDISCOMBE.

An extraordinary Bramble has been found by Major Bates van de Weyer in Hungerford Park, Berks, in which the ripe fruits separate from the receptacle, are dull red, and have the flavour of a Raspberry. It is not a sub-erect species. The stems root at tip, but I can see no evidence in the leaf or stem of *idaeus*. The specimens are, unfortunately, too incomplete to name.

†887. FRAGARIA CHILOENSIS Duchesne. Quite naturalised on railway-bank near Hanslope, Bucks, where it has been for many years, DRUCE; Glais, Glamorgan, WEBB.

†892. POTENTILLA RECTA L. Taplow, Bucks, Miss BARBARA BUCKLER.

†896. P. INTERMEDIA L. Ross, Hereford, Miss ARMITAGE; flour mill yard, Whitehaven, Cumberland, WILLIAMSON.

901. P. REPTANS L., var. MICROPHYLLA Tratt. Holwood Park, Keston, W. Kent, ST J. MARRIOTT.

†906. P. NORVEGICA L. Pewsey Station, Wilts, HURST.

909. ALCHEMILLA ALPESTRIS Schmidt. Sligachan, Skye, DRUCE.

†921. POTERIUM CANADENSE A. Gray. Found by Canon LITTLE and Mr G. HAYNES on a stream-side near Glenloin House, Arrochar, at the head of Loch Long. Canon Little tells me people think it was introduced with ballast.

†*952 (2). ROSA RUGOSA Thunb. Crinnis Sands, E. Cornwall, L. J. MEDLIN, ex E. THURSTON.

966. CRATAEGUS MONOGYNA Jacq., var. (vel forma) TRILOBA Druce. Gt. Hallingbury, N. Essex, BROWN.

†*969 (2). C. AZAROLUS L. In a hedge, Hayling Island, S. Hants, Miss KILLARD.

†972. COTONEASTER MICROPHYLLA Wall. On a cliff at Whitford, Sker, on the north coast of Gower, Glamorgan, quite naturalised and difficult to reach, Hon. Mrs A. LEITH.

†972 (2). C. SIMONSII Baker. Thames side between Kingston Bridge and Hampton Court, Middlesex, BRITTON. "Probably this" —A. THELLUNG.

†973. AMELANCHIER CANADENSIS Med. Hayes Common, W. Kent [Ref. No. 199], BRITTON. Det. A. THELLUNG.

†993. SAXIFRAGA SIBTHORPII Boiss. Near Studland, Dorset, BOYS.

†1011. SEDUM RUPESTRE L. Wall, near Calder Bridge, Cumberland, TEMPLEMAN.

†1012. S. REFLEXUM L. Bridgnorth, and on a rocky cliff near Bilton, Salop, DRUCE.

1024. S. VILLOSUM L. Cushie, N. Aberdeen, WILSON.

1027. DROSERA ANGLICA Huds. Near Borth, Cardigan, Mrs DEBENHAM.

*1038. CALLITRICHE POLYMORPHA Lönnr. Wybunbury, Cheshire, 1908, DALTRY. I think it is correct although the specimens are poor.

†1044. LYTHRUM NEOMANTHUM Link. Dried up pond below Parnham, Beaminster, Dorset, A. W. GRAVESON.

†1045. L. HYSSOPIFOLIA L. Hull, Miss A. B. COBBE.

1046. EPILOBIUM ANGUSTIFOLIUM L., var. BRACHYCARPUM (Leight.). Devon, Miss TODD.

1075. ECBALLIUM ELATERIUM Rich. Near Hitchin Station, Herts. Introduced with drug-cultivation, A. W. GRAVESON.

1080. ERYNGIUM CAMPESTRE L. At the foot of the chalk-down, near Wrotham, Kent, F. DRUCE.

†*1090. BUPLEURUM ROTUNDIFOLIUM L. Cannock Chase, Staffs, Sir R. CURTIS.

†1091. B. LANCIFOLIUM Horn. Cardiff Docks.

†1099. APIUM LEPTOPHYLLUM Muell. Hull, Miss A. B. COBBE.

†1101. AMMI MAJUS L. Lucerne field, Buckland, Herts, A. W. GRAVESON; Tunstall, Suffolk, Rev. W. MASON.

1105. CARUM PETROSELINUM B. & H. Abundant and naturalised at Bridgnorth, Salop, DRUCE.

1113. PIMPINELLA MAJOR Huds. Near Potterne, Wilts, GWATKIN; Southwell, Notts, Rev. W. MASON. Var. DISSECTA Druce. Ripon, Yorks, PICKARD.

1114. P. SAXIFRAGA L., var. POTERIIFOLIA Wallr. Much Wenlock, Salop, DRUCE; Largo, Fife, Lady JOAN LEGGE.

†1128. ANTHRISCUS CEREFOLIUM Hoffm. On rubbish-heap near Forge Valley, Yorks, Miss COBBE.

1147. ANGELICA SYLVESTRIS L., var. DECURRENS Wallr. Needwood, Staffs; Buildwas, Salop, DRUCE.

†1165. CAUCALIS LEPTOPHYLLA L. Bristol, Mrs SANDWITH.

*1194. GALIUM ERECTUM Huds. Corbridge-on-Tyne, Northumberland, R. B. COOKE.

1197. G. ULIGINOSUM L. Patshull, Staffs, DRUCE.

†1211. ASPERULA CILIATA Rochel. Slindon, Sussex, Miss BARBARA BUCKLER.

†1234. SCABIOSA MARITIMA L. Buckland, Herts, A. W. GRAVESON.

1243. SOLIDAGO VIRGAUREA L., var. ACUTIFOLIA Druce. Erne Toog, Stromness, Orkney, JOHNSTON. Var. PLUKENETIANA Druce. Point of Cava, Orkney, JOHNSTON.

†1245 (2). S. SEROTINA Ait. Thursley, Surrey, Mrs WEDGWOOD.

1248. BELLIS PERENNIS L., var. PROLIFERA. Dunrossness, Shetland, Mrs SAXBY. A form with the capitulum consisting of almost pure white ligules, the disc florets very few and not yellow, Pockley, near Helmsley, Yorks, DALTRY.

†1254. ASTER LONGIFOLIUS Lam. Cothill, Berks, DRUCE. Det. A. THELLUNG.

†1255. A. LAEVIGATUS Lam. Uxbridge, Middlesex, Mrs WEDGWOOD. Det. A. THELLUNG.

†1255. A. FLORIBUNDUS Willd. Stromness, Orkney, DRUCE. Det. A. THELLUNG.

1266. FILAGO APICULATA G. E. Sm. Berechurch, N. Essex, DRUCE; near Cookham Dene, Berks, Major BATES VAN DE WEYER.

†1292. AMBROSIA TRIFIDA L. Hull, Miss M. COBBE.

†*1303. HELIANTHUS PETIOLARIS Nutt. Avonmouth Docks, W. Gloster, Miss ROPER.

†1306. GUIZOTIA ABYSSINICA Cass. Cardiff Docks, Miss VACHELL.

†1308. COREOPSIS TINCTORIA L. Avonmouth Docks, W. Gloster, Miss ROPER.

1309. BIDENS CERNUA L., var. RADIATA DC. Hall Bottom, near Gosforth, Cumberland, WILLIAMSON.

†1311 (4). B. FRONDOSA L. Bristol, Mrs SANDWITH. Det. A. THELLUNG.

†1315. HEMIZONIA PUNGENS T. & G. Cardiff Docks.

†1322 (2). TAGETES MINUTUS L. Bradford, Yorks, CRYER.

1353. CHRYSANTHEMUM LEUCANTHEMUM L., var. DISCOIDEUM Druce. Mevagissey, Cornwall, Miss TODD.

†1356. C. MACROPHYLLUM W. & K. Dundee, Forfar, DRUCE and CORSTORPHINE. Det. A. THELLUNG.

†1356 (7). C. MAXIMUM DC. Galleywood Common, S. Essex, Mrs WEDGWOOD & BROWN.

†1356 (9). C. SINENSE Sabine. Giffnock, Renfrewshire, GRIERSON.

†1357. C. CORONARIUM L. Cardiff Docks.

†1358. C. BALSAMITA L. Canton, Cardiff, Glamorgan, SMITH.

1360. MATRICARIA INODORA L., flore pleno. Hull, Miss M. COBBE; Glasgow, GRIERSON.

†1362. M. SUAVEOLENS Buch., var. OCCIDENTALIS (Greene). Christchurch, S. Hants, A. W. GRAVESON.

†1368. ARTEMISIA CAMPESTRIS L. Glasgow, GRIERSON. "Probably this."—A. THELLUNG.

†1372. A. PONTICA L. Hayes, Kent, Mrs WEDGWOOD. Det. A. THELLUNG.

†1380. A. BIENNIS Willd. Par, Cornwall; Uxbridge, Middlesex, Lady DAVY & Mrs WEDGWOOD; Hull, Miss M. COBBE.

†1386. PETASITES ALBUS Gærtn. Boynton, E. Yorks, FLINTOFF.

†1396. SENECIO SQUALIDUS L. Par, Cornwall, Hon. Mrs R. M'KENNA; Rumney, Monmouth, WADE; Sedbury, W. Gloster, Miss A. B. COBBE; Cheltenham railway, KNIGHT; Abbey Wood, W. Kent, ST J. MARRIOTT & POORE. Var. INCISUS Guss. Chepstow, Monmouth, Miss A. B. COBBE.

†1399. S. VISCOSUS L. Stockcross, Berks, VAN DE WEYER; *Kemble, N. Wilts, DRUCE.

†1402. S. CINERARIA DC. Highcliffe, S. Hants, ST J. MARRIOTT. × JACOBAEA. Horton Cliff, Gower, Glamorgan, WEBB.

1424. CARDUUS NUTANS × ACANTHOIDES. Lilburn, Northumberland, A. E. EVANS.

†1425. C. PYCNOCEPHALUS L. Radyr, Glamorgan, SMITH. Det. A. THELLUNG.

1433. CIRSIUM ARVENSE Scop., var. MITIS, sub-var. ALBIFLORA. Newburgh, Wigan, Lancs, Miss R. BRIGHT. Var. VESTITUM Koch. Skaill, Orkney, DRUCE. Var. MARITIMUM (Fries) Druce. Aldeburgh, E. Suffolk, DRUCE.

†1443. MARIANA LACTEA Hill. Top of Bryn Ewryn, Colwyn Bay, Denbigh, PICKARD.

1446. SERRATULA TINCTORIA L., var. ALBA. Near Cardiff, Glamorgan, TEMPLEMAN.

1449. CENTAUREA JACEA L. Hayling Isle, S. Hants, Miss HILLARD; Milverton, Warwick, BROMWICH. Sub-sp. JUNGENS Gugl., var. FIMBRIATISQUAMA Gugl. West Malling, W. Kent, WOLLEY-DOD; Askham Lade, L. Lancs, 1915, LUMB.

1451. C. NIGRA L. Mr C. E. Britton has named the following:

C. NEMORALIS Jord. N. Warnborough, N. Hants, Miss PALMER, in *Hb. Druce*; Hungerford, Berks and Wilts; Charlbury and Yarnton [Ref. No. 954], Oxon; Twinstead [Ref. No. Z 1011], N. Essex; Denshanger, Northants; Buckingham; Cannock Chase, Staffs, DRUCE; Rushock, Worcester, Miss WILKINSON. Forma RADIATA Britton. Wolvercote, Oxon; Cumnor, Berks; Hertford, DRUCE. Var. SUBINTEGRA Britton. Tayside, Perth; Rescobie, Forfar, DRUCE. Forma RADIATA Britton. Princes Risborough, Bucks [Ref. No. Z 1056], DRUCE.

C. DRUCEI Britton. Maplestead, N. Essex. * A plant from Princes Risborough, Bucks, probably belongs to forma RADIATA, DRUCE.

*1451. C. SURREJANA Britton. Muswell Hill, Middlesex; Bridgnorth, Salop, DRUCE.

†1463. C. MELITENSIS L. Claddagh, Galway, Mrs EVANS.

†1465. C. CALCITRAPA L. Barry, Glamorgan, SMITH.

†1468. C. ASPERA L. Barry, Glamorgan, SMITH.

†1476. CARTHAMUS LANATUS L. Cardiff, Miss VACHELL; Glasgow, GRIERSON.

†1477. C. TINCTORIUS L., var. INERMIS. Glasgow, GRIERSON.

1480. CICHORIUM INTYBUS L. In a field near Kilmallie Church, Westerness, WEBB.

†1492. CREPIS MOLLIS Asch. Swaythling, S. Hants, RAYNER. A very unexpected adventive; probably a fodder introduction.

1493. C. PALUDOSA Moench. Markland Grips, Notts, GOULDING.

1494. C. NICAEENSIS Balb. The record, " Shalford, S. Hants, Miss Todd," is misplaced. The plant from Shedfield, Hants, belongs to *C. biennis* L.

1502. C. TARAXACIFOLIA Thuill. Patshull, Salop, DRUCE.

†1512. HIERACIUM AURANTIACUM L. St Peter's Port, Guernsey, 1854, PIQUET; Hirsel Woods, Roxburgh, *Hb. Druce.*

†1512 (2). H. BRUNNEO-CROCEUM Pugsl. Mawgan, Cornwall, 1903, LOYDELL; Calbone, Somerset, 1867, HAYNE; Patshull, Staffs, Lady J. LEGGE's SCOUTS; Formby, Lancs, WHELDON (Linton says of this " *aurantiacum*, not easily mistaken "! (see *Rep. B.E.C.* 262, 1912); Kyle of Loch Alsh, W. Ross; Coggs Witney, Oxon; Much Wenlock, Salop, DRUCE.

1528. H. MARSHALLI Linton. A plant, nearest to this, on Ben Udlaidh, opposite Ben Laoigh, at 2000 ft., Lady EDINA AINSWORTH.

1542. H. RUBICUNDUM F. J. H., var. BOSWELLII W. R. L. Betty Hill, W. Sutherland, DRUCE; Grange-over-Sands, W. Lancs, Miss M. COBBE.

1550. H. BRITANNICUM F. J. H. Aysgarth Falls, N.-W. Yorks, Miss M. COBBE.

1572. H. SERRATIFRONS Almq., var. TORTICEPS (Dahlst.). Symond's Yat, W. Gloster, REDGROVE.

1573. H. PICTORUM Lint. Mr Pugsley says of some specimens from the Hill of Hoy, Orkney, 1920, " cf. *Pictorum*," DRUCE.

1609. H. SCIAPHILUM Uechtr. Lichfield, Staffs, DRUCE. Var. TRANSIENS. Hawes, N.-W. Yorks. Var. GRANDIDENS. Gayle Beck, N.-W. Yorks, Miss M. COBBE.

1614. H. DIAPHANOIDES Lindeb. Carnedd Dafydd, Carnarvon, DRUCE.

1637. H. BOREALE Fr., var. DUMOSUM. Southampton, RAYNER.

*1638. H. UMBELLATUM L. Creg Meish, Isle of Man, ex Rev. J. TALBOT, WHELDON.

[1642. LEONTODON HISPIDUS L. On the Slioch, W. Ross, Miss CATOR & G. TALBOT. Needs confirmation. I hesitate to include it in the W. Ross list till I see a specimen.]

1648. LACTUCA VIROSA L., var. INTEGRIFOLIA S. F. Gray. Dartford Heath, Kent, REDGROVE.

1649. L. SERRIOLA L. Hythe Quay, Colchester, BROWN; Hertford, A. W. GRAVESON; Harlech, Merioneth, BARTON; Chesterton, Cambridge, MILL & EVANS.

1650. L. SALIGNA L. Barton and Chesterton, Cambridge, MILL, ex EVANS.

1645. TARAXACUM. Herr Dahlstedt has kindly named the following specimens of Dandelions which, for the sake of convenient reference, are here arranged alphabetically. They refer to new county records chiefly.

T. ANGLICUM Dahlst. The Parks and Yarnton, Oxford, 1921; Wytham, Berks.

T. BRACHYGLOSSUM Dahlst. Quenvais, Jersey, 1877; Afton Downs, Isle of Wight; Southall, Middlesex; Great Brickhill, Bucks, 1900; Tubney, Berks, 1909 [Ref. No. 2001]; Stow Wood, Oxon, 1889; Harleston, Northants, DRUCE; Shotover, Oxon, 1824, BLAKE in *Hb. Druce;* Hitchin Cricket Field, Herts, LITTLE; near Leicester; Great Malvern, Worcester, Miss PALMER; North Berwick, Haddington, 1858, BELL; Monifieth Links, Forfar, 1913, CORSTORPHINE; Skye, 1920, DRUCE; Wimbledon, etc., Surrey; Hampton Court, Middlesex, TODD.

T. COPIDOPHYLLUM Dahlst. Bradmore Green, Surrey, TODD.

T. CROCEIFLORUM Dahlst. Botleys, Chertsey, Surrey, TODD.

T. FAEROENSE Dahlst. (*T. spectabile*, var. *maculigerum*, and *T. spectabile*, var. *Girhildae* Beeby). I gathered this in Glen Clova, Forfar, in 1882. See also *Rep. B.E.C.* 566, 1919. It is widely distributed as I have gathered it in Caenlochan, Forfar; Teesdale, Durham, 1909, then thought to be a form of *spectabile*; Glen Shee,

E. Perth, 1889; Ben Dearg, W. Ross, 1902; E. Ross; Braeriach, Easterness; Ben Heasgarnich, M. Perth; cliffs of Twl Dhu, Carnarvon, 1899; Bangor, Carnarvon, 1917, as *rubrinerve*; Spiggie, Bressay, Burga Water, Loch Girlstone (as *Girhildae*) Zetland; Stromness, Orkney, 1920. Yeldersley, Derby, W. R. LINTON, as *udum*; Tongue, Sutherland, MARSHALL, as *udum*.

T. FULVUM Raunk. Addington Park, TODD; Brickhill, Bucks, 1902; Longworth, Berks [Ref. No. X 12]; Oxford [Ref. No. Y 107]; Galashiels, Selkirk, DRUCE.

T. HAMATUM Raunk. A common plant in the home counties. Mr Todd has collected it at Wimbledon, Mitcham, Chertsey, Wickham, and many places in Surrey. I have also seen it at Uxbridge, Bucks; Acton, Southall, etc., Middlesex; Bracknell, Berks; Pyrford, Surrey, 1918; Chalvey, Bucks, 1900; Hoddesdon, Herts.

T. LACISTOPHYLLUM Dahlst., the commonest British representative of the Erythrosperma, is widely distributed. Sheen, Addington, and many Surrey localities, TODD; Dartford Heath, St. J. MARRIOTT; St Ouen's and St Helier's, Jersey; Pyrford, Surrey; Swanage, Dorset; Wilstone, Wilts; Littlestone-on-Sea, Kent, 1910, DRUCE; Bracknell, Berks, 1918; Barry Island, Glamorgan, RIDDELSDELL; Carisbrooke, Isle of Wight, Miss PALMER; Brean Down, N. Somerset [Ref. No. 122], BARTON; Southsea Common, Hants, Miss PALMER; Newbottle, Brackley, Northants; Brickhill, and top of Ivinghoe Beacon, Bucks; Aldeburgh, E. Suffolk; Sudbury, Suffolk; Bridgnorth, Salop; Patshull, Staffs; Llandudno, Carnarvon, 1899; Glen, Peebles, DRUCE; Windmill Hill, Hitchin, Herts, LITTLE; Mersea, etc., N. Essex, BROWN; Roundway Downs, N. Wilts [Ref. No. 2838], MARSHALL, as *udum*; Chesterton, Warwick, 1893, BROMWICH, as *udum*; Winchester, on the Down, 1906, JACKSON; near Shirley, Derby, W. R. LINTON, as *corniculatum*; Crosby, Lancs, 1875, LEWIS; Kirkcaldy Links, Fife, BOSWELL SYME.

T. LAETICOLOR Dahlst. Northampton Race Course, April, 1873 (one of the first plants collected by me for an herbarium), DRUCE.

T. LAETUM Dahlst. St Ouen's, Jersey, 1920; Barmouth, Merioneth, DRUCE; Kirkcaldy, Fife, BOSWELL SYME; Seaton Carew, Durham, 1887, E. Fox.

T. LONGISQUAMEUM Dahlst. As a modification, Hailey, Oxford, 1919. Very near *Arrhenii*, DRUCE.

T. PALUSTRE DC., seg. Yarnton, Oxon; Chesham, Bucks; Gort, Galway, 1909; The Park, Oxford, 1921, DRUCE; Ashwell Common, Herts, COLEMAN; Accrington, Lancs, 1852, DUGDALE, not identical with the Swedish form.

T. NORDSTEDTII Dahlst. Wimbledon, Sheen, etc., Surrey, TODD; Shotover, Oxon; Needwood, Staffs, DRUCE; Bridgend, Glamorgan, RIDDELSDELL, named *udum* by Marshall, which like *Euphrasia curta glabrescens* seemed to be a convenient name for any plant off type.

T. SUBLACINIOSUM Dahlst. Brading Harbour. Isle of Wight, Miss PALMER; Shipley, Yorks, CRYER; Lechlade, Gloster; Farringdon, Berks, 1921 [Ref. No. Y75]; as a form, Bicester, Oxon [Ref. No. Y47]; Stow Wood, Oxon [Ref. No. Z80]; the Parks, Oxon [Ref. No. Y30]; Blisworth, Northants [Ref. No. Y38]; Stoney Stratford. Bucks, DRUCE.

T. TENEBRICANS Dahlst. Yarnton, Oxford, DRUCE.

1658. SONCHUS OLERACEUS L., var. CILIATUS (Lam.). Patshull, Staffs; Bridgnorth, Salop; Hanslope, Bucks; Rottingdean, Sussex, DRUCE. Var. TRIANGULARIS Dum. Roade, Northants; Ware, Herts; Westonbirt, Gloster, DRUCE.

1666. JASIONE MONTANA L., var. LATIFOLIA Pugsl. Clovelly, N. Devon; Grève L'Etac, Jersey; Petit Bo, Guernsey; Spiggie, Burrafirth, Shetland, DRUCE; Carrick, Eday, Orkney, JOHNSTON. Var. MARITIMA Reichb., or near it, Lizard Down, Cornwall, DRUCE.

†1674. CAMPANULA RAPUNCULOIDES L. Ouseby, Cumberland, Rev. W. MASON.

†1676. C. PERSICIFOLIA L. Roadside near Pardshaw, Cumberland, TEMPLEMAN.

†1679. LEGOUSIA SPECULUM Fisch. Cowbridge, Glamorgan, Dr VACHELL.

1694. ERICA CINEREA L., var. SPLENDENS. Poole Harbour, Dorset, T. E. BELCHER; Urrisbeg, Galway, DRUCE.

1708. PYROLA MEDIA Sw. *Salop, PHILLIPS, ex BENNETT; Fyvie, Aberdeen, TURREFF.

1709. P. MINOR L. *Lybster, Caithness, LILLIE, ex BENNETT; Fyvie, Aberdeen, TURREFF.

1711. P. SECUNDA L. Edinburgh; FIFE, in *Hb. Edin.*, teste ARTH. BENNETT, in *Trans. Bot. Soc. Edin.*, 75, 1920.

1712. HYPOPITYS MONOTROPA. Hewelsfield, W. Gloster, REDGROVE.

1713. LIMONIUM VULGARE Mill., var. PYRAMIDALE Druce. Near Conway, Carnarvon, *Hb. Druce.*

1721. STATICE PLANIFOLIA Druce. Helvellyn, Cumberland, PICKARD.

*1745. CENTUNCULUS MINIMUS L. Howgill, W. Yorks, A. WILSON.

†1747. SYRINGA VULGARIS L. Hedges near Fairford, E. Gloster, DRUCE.

†1750. VINCA MAJOR L. Bishopston Valley below Great Kjttle, Glamorgan, looking wild, WEBB.

†1751. V. MINOR L. Stogumber, Somerset, March 1922, DRUCE.

1757. CENTAURIUM PULCHELLUM Druce. Hayling Island, S. Hants, Miss HILLARD.

†1777. POLEMONIUM CAERULEUM L. Brick-pits, South Carr, Notts, known for 20 years, GOULDING.

†1778. PHACELIA CILIATA Benth. Romford, Essex, Lady DAVY; Potterne, Wilts, GWATKIN.

†1783. OMPHALODES VERNA Moench. Stowe, Norfolk, J. L. DUDDINGTON & LITTLE.

1785. CYNOGLOSSUM MONTANUM L. Bluntisham, Hunts, Rev. E. PEAKE. Hunts.

†1789 (2). BENTHAMIA ANGUSTIFOLIA (Lehm.) Druce. Hull, Yorks, Miss M. COBBE.

†1789 (3). B. LYCOPSIOIDES Lindl. Farne Island, Northumberland, Mrs HOWARD PEASE; Drayton, E. Norfolk, CLARKE.

†1789 (6). B. MENZIESII (N. & M.) Druce. Torquay, Devon, VINCENT; Moulsford, Berks, Miss NEILD; near Sleaford, Lincs, Miss LANDON; Brislington, Bristol, Mrs WEDGWOOD; Limpsfield, Surrey, Rev. E. CRUTWELL; Drayton, Middlesex, DRUCE. Botley, Oxon, GAMBIER-PARRY. Det. A. Thellung as probably *Amsinkia Menziesii* Nels. & M'Bride.

†1792. SYMPHYTUM PEREGRINUM Ledeb. Lamplugh, Cumberland, TEMPLEMAN; Bridgnorth, Salop, DRUCE.

†1792 (2). S. ASPERUM Lepech. Port of Menteith, Perth, *Hb. Druce.*

†1802. ANCHUSA AZUREA Mill. Sleaford, Lincs, Miss LANDON; Chipping Norton, Oxon, DRUCE.

1808. PULMONARIA OFFICINALIS L. Completely naturalised in the woodlands of Kingston Lisle Park, Berks, shown me by Major BATES VAN DE WEYER, who has known it there for many years; Hampton Loade, Salop, REYNOLDS; in the wilderness, Walcot, Oxon, HAYNES & DRUCE.

1822. LITHOSPERMUM OFFICINALE L., var. LATIFOLIUM Salm. Clandon Downs, Surrey, MONCKTON.

†1827. ECHIUM PLANTAGINEUM L. Splendid specimens near St Just, E. Cornwall, THURSTON. See *Suppl. Fl. Cornw.* 93, 1922. Gloster Docks, GAMBIER-PARRY.

†1831 (2). VOLVULUS DAHURICUS (Sims) Druce. Bexhill, H. L. GREEN. Det. A. THELLUNG as ? *C. dahuricus* Sims. (*C. sepium*, var. *americanus* Sims ? = var. *roseus* DC. ?)

1833. CONVOLVULUS ARVENSIS L., var. STONESTREETII Druce. Basingstoke, Hants, G. W. WILLIS, ex RAYNER.

†1843 (2). CUSCUTA SUAVEOLENS Ser., teste Kew. At Trenvissick Farn, twining up *Lychnis dioica*, Par, Cornwall, ex THURSTON.

1849. SOLANUM TRIFLORUM Nutt. Cardiff, *Hb. Storrie.*

†1855. DATURA INERMIS Jacq., teste Kew. Mead Lane gravel-pit, Hertford, A. W. GRAVESON.

†1860. VERBASCUM PHLOMOIDES L. Par, Cornwall, Mrs WEDGWOOD. Det. A. THELLUNG.

†1863. V. VIRGATUM Stokes. Hayling Island, S. Hants, Miss HILLARD.

†1877. LINARIA PURPUREA Mill. Kingsdown Shingle, Kent, Lady KATHLEEN STANLEY.

1878. L. REPENS Mill. Matherne, Monmouth, REDGROVE; railway bank, Giggleswick, Yorks, PICKARD.

†1882 (2). L. ARENARIA DC. Still spreading at Braunton Burrows, Devon, 1922, Lady GWENDOLEN CHURCHILL.

1892. SCROPHULARIA ALATA Gilib. Good specimens near Buildwas, Salop, DRUCE.

†1898. MIMULUS GUTTATUS DC. Cushie, N. Aberdeen, WILSON; in dry places at Cwmllynfell, Glamorgan, WEBB.

1899. M. MOSCHATUS Dougl. Near Cushie, N. Aberdeen, WILSON.

†1904. ERINUS ALPINUS L. Tutshill, Chepstow, Gloucester, Mrs WEDGWOOD.

†*1922. VERONICA TRIPHYLLOS L. In a neglected kitchen-garden. Bradfield, Berks, R. J. RYLE.

1933. EUPHRASIA BREVIPILA Burnat & Gremli. Devil's Bridge, Cardigan, J. S. WALL; Langness Peninsula, Isle of Man, WHELDON; Jedburgh, Roxburgh, BURDON; Kyleakin, Skye, DRUCE; Stenness. Orkney, MARSHALL [Ref. No. 2403] as a hybrid of *curta* and *brevipila*, but Lumb sees no trace of *curta* in it.

1934. E. NEMOROSA Pers., var. CILIATA Drabble. Grand Mare, Guernsey, DRUCE; Woolly Bay, N. Devon, H. E. FOX; Bexhill,

E. Sussex, H. L. GREEN; Twinstead, N. Essex; Linton, Cambridge; Woburn, Beds; Park Corner, Oxon, DRUCE; Chesham Bois, Charteridge, Bucks, BRITTON; Oystermouth, Glamorgan, 1909, BAILEY; Pennywilt, etc., Brecon, BARTON; Sapey Brook, Hereford, J. E. WALL; Mouzell, Lancs, PEARSALL; Fyling Hall, Yorks, J. E. WALL; Bodeilo, Holyhead, etc., Anglesey; Duncansby Head, Caithness, DRUCE.

1934 (3). E. HIRTELLA Jord. Coffins Well Parish, Devon, Miss LARTER, *in litt.*, teste HIERN.

1934 (4). E. CONFUSA Pugsl. Moor of Helmer Tor, E. Cornwall [Ref. No. 41], RILSTONE. This Pearsall and Lumb refer to *E. minima* Jacq.

1936 (2). E. SEPTENTRIONALIS D. & L. Bettyhill, Sutherland, DRUCE; Perranporth, Cornwall, RILSTONE, teste LUMB.

1938. E. FOULAENSIS Towns. Coffins Well Parish, Devon, Miss LARTER, teste HIERN.

1939. E. MICRANTHA Reichb. Balsall Common, Warwick; Glen, Peebles; Strathpeffer, E. Ross; Den of Durkadale, Black Crag, Orkney, DRUCE.

1940. E. SCOTTICA Wettst. To this Lumb refers Marshall's No. 2398 from Tongue Bay, W. Sutherland, which he records as *curta* × *scottica*. Lumb says there is no evidence of *curta* in it.

1940 (2). E. MINIMA Fr. To this Pearsall and Lumb refer Marshall's No. 4449 from Simon's Bath, Somerset, and No. 4443 from Withypool, S. Somerset.

1941. E. ROSTKOVIANA Hayne, teste Lumb. Tunbridge Wells, Kent, Miss PALMER in *Hb. Druce;* Chesham Bois, Cholesbury, Bucks, BRITTON; Hyfnant, Cardigan, J. E. WALL; Bervie, Kincardine; Reay, Caithness; Glen Cahir, Clare; Morley Bridge, Co. Kerry, some with very numerous glands, others nearly destitute of clothing, DRUCE.

1943. E. KERNERI Wettst. Probably the *minima* from Kirkmichael, E. Perth, N. TRETHEWEY; Stubhampton, Dorset, MELVILL; Twinstead, N. Essex; Swaffham, W. Norfolk; Hertford; Llanberris, Carnarvon, DRUCE; *Sanday, Orkney, JOHNSTON in *Trans. Bot. Soc. Edin.* 58, 1921; Forge Valley, E. York, J. E. WALL; Glen Cahir, Co. Clare, DRUCE.

1952. RHINANTHUS CRISTA-GALLI L., var. ROBUSTUS Druce. Carmarthen, HAMER.

1954. R. STENOPHYLLUS Schur. S. Stoneham, S. Hants, RAYNER; Laugharne, Carmarthen, HAMER.

1966. OROBANCHE MAJOR L. Between Amesbury and Stonehenge, Wilts, Hon. Mrs. Ivo FIENNES. It is common in that neighbourhood.

1966 (2). O. RETICULATA Wallr., var. PROCERA (Koch) Druce. Near East Keswick, Yorks, W. JOHNSON, jun., ex W. JOHNSON.

1974. LATHRAEA SQUAMARIA L. On spruce fir, High Force, Teesdale, Durham, PICKARD.

1977. UTRICULARIA INTERMEDIA Hayne. Little Arrow Moor, S. of Coniston Old Man, N. Lancs, TEMPLEMAN.

1977 (2). U. OCHROLEUCA Hartm. Ennerdale, Cumberland, TEMPLEMAN.

1978. U. MINOR L. Cogra Moss, Lamplugh, Cumberland, TEMPLEMAN.

1989. MENTHA ALOPECUROIDES Hull. Little Maplestead, N. Essex, DRUCE; Blakesley, Northants, 1904, LOYDELL, as *rotundifolia*; *Bishop's Stortford, Herts, A. W. GRAVESON.

1990. M. VILLOSA Huds. (*M. longifolia* × *spicata* × *rotundifolia*). Near Malvern, Worcester, WALL.

1990. M. LONGIFOLIA Huds., var. NICHOLSONIANA Strail. Canton, Cardiff, Glamorgan, 1922, SMITH.

1991. M. SPICATA L. Broad Windsor, Dorset; Water Hall Farm, Hertford, A. W. GRAVESON; Patshull, Staffs, DRUCE.

1993. M. PIPERITA L. Following the most eminent students of this group, in the *British Plant List* I prefixed the hybrid signs to the Peppermint, which I believe to have arisen from *M. aquatica* and *M. spicata*. It may have been that a form of *aquatica* more destitute of its characteristic odour was the origin of the original cross. It is quite likely that a monasterial garden may have been the source whence most of the British *Mentha piperita* has been scattered over the country, since as *M. spicata* is not a native Mint, it could not have originated here before that species had been introduced. Perhaps it was during the Roman occupation that it arrived. But as there are many varieties of each of the assumed parents, we might expect a great variation in the Peppermint. Such is not the case—there are a few variations, but the mass of the British *piperita* is singularly uniform as the type the *M. officinalis* Hull. The var. *vulgaris* of Sole is comparatively rare, although a form of this, called the Black Peppermint, is largely cultivated, affording as it does, on distillation, a fragrant brand of essential oil. In addition there are, as Mr Fraser points out, plants rather more hairy than the type. These may be the offspring of a cross in which a more hairy variety of *M. aquatica* is one of the parents, or they may be a secondary hybrid in which *piperita* may have crossed with *aquatica*. Mr J. Fraser has recently examined the sheets of the group in my herbarium. He recognises the var. *vulgaris* from Mount Bay, Cornwall, 1878, CURNOW; Deeping, Northants; Lynmouth, N. Devon; Balsall, Warwick; North Leigh, Oxon. A plant agreeing with the morphological characters of *M. piperita*, but with the odour of *spicata*, was found by Mr C. P. Hurst at Bedwyn Brailes, Wilts, and is distributed this year.

1996. M. VERTICILLATA Huds., var. ACUTIFOLIA (Sm)., with glabrous pedicels. Dalmally, Argyle, DRUCE.

2012. SATUREIA NEPETA Scheele. Barry, Glamorgan, SMITH.

†2023. SALVIA PRATENSIS L. Ickleton, Cambridge, A. SHRUBBS. ex A. J. EVANS.

†2024. S. SYLVESTRIS L. Barry, Glamorgan, SMITH.

†2025. S. NEMOROSA L. Grosmont, N. Yorks, FLINTOFF.

2031. S. VERTICILLATA L. Hayle, Cornwall, Miss TODD; Carnforth, Lancs, MASON.

†2035 (3). NEPETA MUSSINI Spreng. Weston-super-Mare, N. Somerset, SMITH.

2046. PRUNELLA LACINIATA L. Chelsham, Surrey, BEADALE.

†2048. SIDERITIS MONTANA L. Riddings, Lanark, GRIERSON.

2062. GALEOPSIS TETRAHIT L., var. NIGRICANS Bréb. Near Winterham, North Down, W. Kent, ST JOHN MARRIOTT.

†2067. LAMIUM MACULATUM L. Between Southridge Farm and Aldworth, Beds., Rev. J. DE C. LAFFAN.

†2082. TEUCRIUM CHAMAEDRYS L. Fine specimens, Perranuthnoe, Cornwall, E. THURSTON.

†2085. AJUGA GENEVENSIS L. Hayle, with *Anchusa ochroleuca*, etc., Phillack Towans, Cornwall, THURSTON. It is this species, not *pyramidalis*, which occurs there.

†2089. PLANTAGO INDICA L. Cardiff, Glamorgan, Miss VACHELL.

2090. P. CORONOPUS L., var. PYGMAEA Lange. Limestone turf, Tears Point, Rhosilli, Glamorgan, WEBB.

2092. P. LANCEOLATA L., lusus MULTICEPS. Allerton, Lancs, M. A. WILSON. Forma SPHAEROSTACHYA (M. & K.). East Mersea. N. Essex, BROWN.

†2095. P. LAGOPUS L. Bristol, Mrs SANDWITH.

2099. P. MAJOR L., var. BRACHYSTACHYA Wallr. Leigh Woods, N. Somerset, Miss ROPER.

2101. LITTORELLA UNIFLORA Asch. Llanelly, Carmarthen, HAMER; *reservoir, near Rashgar, Co. Dublin, STELFOX.

†2112. AMARANTHUS ALBUS L. Pyrford, Surrey, Lady DAVY; Cirencester, Gloster, GREENWOOD. Det. A. THELLUNG.

†2113. A. DEFLEXUS L. Hastings, Sussex, L. B. HALL. Det. A. THELLUNG.

†2114 (3). A. SILVESTRE Vill. Lindfield, Sussex, Mrs WEDGWOOD.

†2123. CHENOPODIUM OPULIFOLIUM Schrad. Between Truro and Malpas, Cornwall, Miss TODD. Var. MUCRONULATUM G. Beck. Harrow Road, Middlesex, 1869, J. L. WARREN. × ALBUM = C. PREISMANNI Murr. Colchester, Essex, DRUCE. × ALBUM = approaching C. BORBASII. Leckwith, Glamorgan, A. WADE.

2124. C. ALBUM L., var. PEDUNCULARE (Pers.). By the Heronry, Birch, N. Essex, BROWN. Var. PAUCIDENS (Murr). Radyr, Glamorgan, SMITH; Cannock Chase, Staffs, DRUCE & Sir R. CURTIS. Var. SUBFICIFOLIUM (Murr). Cannock Chase, Staffs; Bridgnorth, Salop, DRUCE. Var. VIRIDE (L.). Naworth, Cumberland, Countess CARLISLE. Var. PSEUDO-BORBASII (Murr). Grangetown, Glamorgan, A. WADE. Var. GLOMERULOSUM (Reichb.). Leckwith, Glamorgan, A. WADE; Dedham, N. Essex, BROWN.

†2125. C. LEPTOPHYLLUM Nutt. Colchester, Essex, BROWN; Leith Docks, Midlothian, FRASER; Hull, Yorks, Miss A. B. COBBE; St Anne's-on-Sea, Lancs, BAILEY.

†2130. C. AMBROSIOIDES L., var. SUFFRUTICOSUM (Willd.). Barry, Glamorgan, SMITH.

†2131 (2). C. STRIATUM Kras. Barry, Glamorgan, SMITH; Hull, Yorks, Miss M. COBBE.

†2131 (3). C. HIRCINUM Schrad. Hull, Yorks, Miss M. COBBE; Leith, Midlothian, FRASER.

†2131 (4). C. BERLANDIERI Moq. By the sea-shore, Walton-on-the Naze, Essex, BROWN.

†2131 (7). C. CARINATUM Br. Bradford, Yorks, CRYER.

†2135. ROUBIEVA MULTIFIDA Moq. Swaythling, S. Hants, RAYNER.

†2135 (5). MONOLEPIS NUTTALLIANA (R. Sch.) Greene, var. MINOR (Moq.) Thell. (*M. trifida* Schrad.). Glasgow, GRIERSON. Det. A. THELLUNG.

†2139. SPINACIA OLERACEA L. Hayle, Cornwall, THURSTON.

†2145. ATRIPLEX TATARICA L. Hambledon Bridge, S. Hants, Mrs WEDGWOOD; Cardiff, Miss VACHELL; Hull, Miss M. COBBE.

†*2151 (2). A. SPONGIOSA F. & M. Ware, Herts, A. W. GRAVESON.

2153 (10). AXYRIS AMARANTOIDES L. Hull tanneries, Yorks, Miss A. B. COBBE.

2166. DONDIA MARITIMA (L.) Druce, var. FLEXILIS (Rouy) Druce. Ray Island, N. Essex, Sep. 1921, DRUCE.

2182. POLYGONUM RAII Bab. Radyr, Glamorgan, SMITH.

†2196. RUMEX LONGIFOLIUS DC. One specimen with above, DRUCE & BROWN.

†2197. R. PATIENTIA L. As a solitary specimen, where it has been known for some years, Virley, Essex. Shown me by Mr G. C. BROWN. Dr Thellung says "cf. *Patientia*." To it he thus doubtfully refers Mr J. E. Little's Dock from Walsworth, Hitchin, Herts, July 1920, which was thought to be *R. longifolius*. Neither the Virley nor the Hitchin Dock agrees with true *R. longifolius*. The identification is agreed to at Kew.

†2199. R. ALPINUS L. Scalesmore Farm, Mockerkin, Cumberland, TEMPLEMAN.

†2210 (3). R. DENTATUS L. To this Dr Thellung says probably belongs a Dock gathered at Galashiels, Selkirk, in 1913, by Miss HAYWARD; Ware, Herts, DRUCE; Elland, York, HORRELL. Det. Dr DANSER, 1922, ex A. THELLUNG.

†2210 (4). R. SALICIFOLIUS Weinm. Thames-side, near Hammersmith, Surrey, BROWN; Hull Docks, Yorks, 1922, Miss A. B. COBBE.

†2210 (13). R. OBOVATUS Danser in Nederl. Kruidk. Archief 241, 1920-1921. *R. paraguayensis* Thell. in Rep. B.E.C. 258, 1920-1921 —an Parodi. Tingley, York, 1918, HORRELL; Glasgow, GRIERSON, as *dentatus* (see *Rep. B.E.C.* 146, 1920); Hull, York, in quantity, 1922, Miss A. B. COBBE. Det. DANSER.

2212. ASARUM EUROPÆUM L. Tewkesbury, Gloster, GAMBIER-PARRY.

2216. HIPPOPHAE RHAMNOIDES L. Diles Lake dunes, Llangenydd, Glamorgan, in fair quantity, 2 miles from houses, WEBB.

2217. VISCUM ALBUM L. On *Liriodendron Tulipera*. Mottisfont, S. Hants, P. M. HALL.

2236. EUPHORBIA EXIGUA L., forma CONDENSATA Druce. Near Cuckmere Haven, Sussex, 1922, G. M. WHITE. Var. RETUSA DC. Great Hallingbury, N. Essex, BROWN.

†2240. RICINUS COMMUNIS L. Cardiff Docks.

2245. ULMUS CARPINIFOLIA Borck. = U. NITENS Moench. Ilkley, Yorks, CRYER.

2246. U. PLOTII Druce. Delabeche, Sketty, Glamorgan, WEBB.

2246. U. VIMINALIS Lodd. Planted at Westonbirt, Gloster. Merely mentioned in order to say that this is not the plant which represents *Ulmus Plotii* in Plot's Herb. at South Kensington, which is labelled *Ulmus folio angusta glabro* Plot Nat. Hist. Oxford 158, 1677, as asserted in the *Camb. Flora*.

†2253 (1). HELXINE SOLEIROLII Req. Foot of a wall, Pennylan, Glamorgan, A. E. WADE; Byfleet, Surrey, Lady DAVY; in dry beds, Cambridge Botanic Gardens, Mrs M. SHARPE.

*2257. BETULA NANA L. Forsinard, Caithness, 1921, J. N. BEDALL-SMITH, ex J. E. LITTLE. N.C.R.

2259. CARPINUS BETULUS L., type, but with small leaves. Pebmarsh, N. Essex, September 1922, DRUCE. Var. PROVINCIALIS Gren. & Godr. Pebmarsh, N. Essex [Ref. No. Z 1113], September 1922, DRUCE.

2262. QUERCUS INTERMEDIA D. Don. Abbey Wood, Kent, ST J. MARRIOTT.

†2265. JUGLANS REGIA L. Seedling plants in Marcham Quarry, Berks, 1922, DRUCE.

†*2267. SALIX PENTANDRA L. Border of Halton Reservoir, Bucks, October, 1922, DRUCE. Doubtless planted.

2269. S. CAERULEA Sm. The Cricket-bat Willow. Twinstead, N. Essex, October, 1922, DRUCE. Planted.

*2285. S. HERBACEA L. Near the summit of Cader Idris, Merioneth, 1922, D. A. JONES.

2297. CERATOPHYLLUM DEMERSUM L. Mr J. F. PICKARD thinks that this grows in a deep pool at Wastdale Head, Cumberland, but it must be collected to verify its name.

2299. HYDROCHARIS MORSUS-RANAE L. Exeter Canal, Devon, 1922, D'URBAN, without personal authority in *Top. Bot.*; pond, Titmore Green, Herts, LITTLE.

2316. HELLEBORINE LATIFOLIA Druce. This is the typical Northumberland plant, A. H. EVANS, *in litt.*

2326 (2). ORCHIS PRAETERMISSA Druce. Near source of burn of Lushan, Birsay, Orkney, JOHNSTON. Var. PULCHELLA Druce. Kincraig, Easterness, DRUCE. × MACULATA. Stanklin Pool, Worcester, C. REA, as a strongly bracteate fern. × FUCHSII. Hants, LOWNDES.

2326 (3). O. PURPURELLA Steph. × MACULATA. Kirka Taing, Fara, Orkney, JOHNSTON.

2327. O. MACULATA L., vera. Cushie, N. Aberdeen, W. WILSON. Var. LEUCANTHA Druce. Hants, LOWNDES.

2327 (2). O. FUCHSII Druce, var. TRANSIENS Druce. Shelswell, Oxon, DRUCE.

2327 (3). O. O'KELLYI Druce. Near Buildwas, Salop, DRUCE; Greenore, in a chalk pit a few yards up the Carlingford Road, after it branches off the main road from Greenore to Dundalk, Co. Louth, DALTRY.

2332. ACERAS ANTHROPOPHORA R. Br. There are three Hampshire records for *Aceras* in Townsend's *Flora of Hampshire*, and none of these are of at all recent date while the localities given are very vague. Moreover doubt has been thrown on the occurrence of *Aceras* in Hampshire in other publications. Mr Druce, for instance, in his *Flora of Berkshire* says under this species :—" I am not satisfied with the records for Hants." So that it seems desirable to remove a slur from a country so rich in Orchidaceae and place on record two stations in the county, one in the mainland and one in the Isle of Wight, about which there can be no uncertainty. The latter was a station well-known for many years to the late Canon Vaughan, and I have more than once seen fresh specimens from there. The approximate locality is known to me but I have never had a chance of finding it for myself. The mainland station is within two miles of Winchester Cathedral, in a rough pasture beside a main road and is just within the vice county of North Hants. The station was discovered quite accidentally, for in June, 1910, I happened to meet a schoolfellow carrying a small bunch of *Aceras*, knowing not at all what he had got hold of. I failed to find the spot that year because I think I was misdirected. The next year, however, 1911, careful search revealed a small patch of 20 plants in flower. The secret of the place was guarded closely and " The Green Man " flourished till the war. Then came the catastrophe. A camp was pitched on the field, the camp became permanent, the spot where the *Aceras* grew was covered with a concrete floor. Of course the camp is demolished now but the concrete floors and foundations still remain, and every June I spend an hour wandering about among the debris hoping against hope that a seedling may

appear in one of the remaining patches of turf. There was a story that an orchid lover, when the camp building commenced, dug up the tubers and planted them in a more secluded spot, but whether this pious thought was actually translated into action I cannot say. Possibly this note may have the effect of bringing to light other authenticated stations in Hampshire. In any case it is as well to place on record this one mainland station, tragic though its history may be. P. M. HALL.

2339. HABENAREA ALBIDA Br. Pastures above Cwm Du Fall, Swansea Valley, Glamorgan, RICHARDSON, ex WEBB.

*2342. H. VIRESCENS Druce. The Quenvais slopes, Jersey, 1922, Lady DAVY. Practically a New County Record.

†2363 (3). TRITONIA CROCOSMIFLORA Nich. Parkmills Woods, Blackfield, Glamorgan; Beasdale, Westerness, WEBB.

2377. GALANTHUS NIVALIS L. No doubt native at Michaelstone-y-Vedw, Monmouth, WADE.

2378. LEUCOJUM VERNUM L. Through the kindness of Mr W. D. Miller I was enabled to see this pretty plant growing at Stogumber in N. Somerset last March. Although the Rev. E. S. Marshall declared in favour of its indigenity, and although there are no other alien plants near, yet the plant seems too circumscribed in its occurrence. The habitat is one in which it should easily have been waterborne to more distant places had it long existed there. I should, therefore, put it as a denizen, as I should in the locality at Wootton Fitzpayne in Dorset.

†2390. ASPHODELUS FISTULOSUS L. Eltham, Kent, Mrs WEDGWOOD; Seaton, Devon, *Hb. Exeter*, D'URBAN.

2395. ALLIUM SCORODOPRASUM L. Near Goathland, Yorks, FLINTOFF; at Sellafield and near railway bridge south of Drigg, both places close to high water-mark, Cumberland, TEMPLEMAN.

†2396. A. VINEALE L. Between Dean and Deanscale (new to div. 1.), Cumberland, TEMPLEMAN.

2400 (2). A. NEAPOLITANUM L. Growing with *A. triquetrum*, near Penzance, Cornwall, STANSFIELD.

2403. A. OLERACEUM L. Abundant at Cuckney Haywood, Notts, GOULDING.

2405. A. SCHŒNOPRASUM L. Tintagel, Cornwall, M. UNDERHILL.

†2407. MUSCARI RACEMOSUM Lam. On rubbish, Fairford, Gloster, 1922, DRUCE.

†2408. HYACINTHUS COMOSUS L. Barry, Glamorgan, Smith.

2419. TULIPA SYLVESTRIS L. Abundant in a plantation near Walcot, Oxon, in sparing flower, a relic of cultivation. Shown to me by Mrs EDGINGTON and Mr G. HAYNES.

2423. NARTHECIUM OSSIFRAGUM Huds. At 1700 ft., Cwmyr Afan, Glamorgan, WEBB.

2427. JUNCUS ACUTUS L. Refound on Hayling Island, S. Hants, Miss HILLARD.

2428. J. CONGLOMERATUS L., *f SPIRALIS. Dean Moor, Cumberland, TEMPLEMAN.

2439. J. COMPRESSUS L. Buildwas, Salop, DRUCE.

†2441. J. TENUIS Willd. Border of Wisley Pool, Surrey, BUTCHER.

2442. J. BUFONIUS L., var. FASTIGIATUS Koch. Rostrevor, Co. Down, L. E. RICHARDS.

†2450. JUNCOIDES NEMOROSUM Morong. Grounds of Gilgarron, near Distington, Cumberland, TEMPLEMAN.

2457. J. ARCUATUM O.K. The Slioch, W. Ross, in its second locality in W. Ross, and at no great elevation, J. G. TALBOT.

2466. SPARGANIUM MINIMUM Fr. Stack o' Cassie, Aberdeen, TURREFF.

2485. POTAMOGETON NATANS L., var. ROTUNDIFOLIUS Bréb. Pond at the Ouenet Noirmont, Jersey. Var. OVALIFOLIUS Fieb. Oxney Lode, Northants. Var. [forma] TERRESTRIS Gray. Oxford Waterworks reservoir, DRUCE.

2488. P. COLORATUS Hornem. In the Cahir River, Co. Clare, with its hybrid *perpusillus*, 1921, DRUCE.

*2489. P. ALPINUS Balb. St. Ouen's Pond, Jersey, a new record, DRUCE.

2495. P. NITENS Weber. Ballymalis, Kerry, in the River Laune, 1921, DRUCE. Det. HAGSTROM.

2506. P. OBTUSIFOLIUS M. & K. Muckross, Kerry, September 1922, rare, only two localities in Kerry, DRUCE.

2508. P. PUSILLUS × TRICHOIDES. Thatcham, Berks, GAMBIER-PARRY.

2508. P. EU-PUSILLUS L. Ballymalis, Kerry, DRUCE.

*2508 (2). P. PANORMITANUS Biv. Fleet Pond, Hants, Lady DAVY.

*2510. P. TRICHOIDES C. & S. In a ditch at St Catherine's, Guildford, F. CLARKE.

*2515. RUPPIA MARITIMA L. Near Borth, Cardigan, Mrs DEBENHAM. N.C.R.

2532. SCIRPUS SYLVATICUS L. Ken Wood, Hampstead, REDGROVE.

2533. S. MARITIMUS L., var. MACROSTACHYS (Willd.). Hammersmith, Middlesex, Lady DAVY.

2546. S. RUFUS Schrad. Sellafield (30 miles south of Hodgson's localities), Cumberland, TEMPLEMAN.

2549. ERIOPHORUM GRACILE Koch. Near Ash Vale, North Camp Station, Surrey, TEMPLEMAN.

2558. CAREX PSEUDO-CYPERUS L., *var. MINOR Hampe. King's Norton, Worcester, BUTCHER.

2573. C. DISTANS L. Sellafield (30 miles south of Hodgson's locality), Cumberland, TEMPLEMAN.

2574. C. PUNCTATA Gaud. Between Petit Port and Corbière, Jersey, in great quantity, Lady DAVY; Polstreath Cove, Cornwall, Miss TODD.

2576. C. LEPIDOCARPA × FULVA. High Force, Teesdale, 1921, Miss COBBE.

2593. C. LIMOSA L. Cogra Moss, at head of reservoir between Lowes Water and Ennerdale Water, Cumberland, TEMPLEMAN. Neither Hodgson nor Baker give a lakeland locality. Excellent specimens.

2600. C. ELATA All. Near Broxbourne and in Gilstone Park, Herts. Very rare in the county according to the Flora but evidently overlooked in many places. In the latter locality there were several fine tussocks by the lake, DRUCE.

†2637. PANICUM CAPILLARE L. Edenbridge, Kent, G. TALBOT.

†2641. SETARIA VERTICILLATA Beauv. Hull Docks, Yorks, Miss M. COBBE.

2643. SPARTINA TOWNSENDII Groves. Now in plenty at Pagham, W. Sussex (see *Rep. B.E.C.* 687, 1919), LITTLE.

†2646 (10). BECKMANNIA ERUCIFORMIS Host. Cirencester, Gloster, GREENWOOD.

†2649. PHALARIS BULBOSA L. Hull, Yorks, Miss A. B. COBBE.

†2650 (2). P. TRUNCATA Guss. Glasgow, GRIERSON.

†2683. AGROSTIS VERTICILLATA Vill. Charleston, Cornwall, 1922, Miss TODD.

2685. A. NIGRA With. Mevagissey, Cornwall, Miss TODD.

†2719. AVENA STRIGOSA Schreber. See the valuable paper by Mr C. V. B. Marquand in *Rep. B.E.C.* 322, 1921. The following are in my herbarium :—Sub.-sp. GLABRESCENS, var. CAMBRICA Marq. Scotland, George Don, circa 1786. Var. ALBIDA Marq. St Luke's, Jersey; Mortlake, Surrey; Clackmannan; Antrim. Sub.-sp. PILOSA Marq., var. FUSCA Marq. Petworth, Sussex; Moulsford, Berks; Burton Latimer, Northants; Beddgelert, Carnarvon; Buness, Unst, Shetland; Antrim.

†2721. A. ORIENTALIS L. Midgham, Berks; Yarmouth, E. Norfolk; Bodorgan, Anglesey; Antrim, DRUCE.

2724. ARRHENATHERUM ELATIUS M. & K., var. BIARISTATUM Druce. Par, Cornwall, THURSTON.

†2737. CYNOSURUS ECHINATUS L. Hayling Island, Hants, Miss HILLARD; near Willen, Surrey, BIDDISCOMBE; Burtersett, Hawes, Yorks, Miss M. COBBE; *Drayton, E. Norfolk; Thetford, W. Suffolk, CLARKE.

2738. C. CRISTATUS L., with a lax, compound inflorescence and with two flowering stalks on the same stem. Battlehillocks, by Lumsden, N. Aberdeen, W. WILSON.

*2741. KOELERIA BRITANNICA Domin. Seascale, Cumberland, TEMPLEMAN.

†*2755. BRIZA MAXIMA L. Drayton, E. Norfolk, CLARKE.

*2768. POA BULBOSA L., and the var. VIVIPARA. Gorey Common, Jersey, in quantity, Lady DAVY. A most interesting addition to the Channel Islands Flora.

2776. GLYCERIA MARITIMA Wahl., var. DISTANTIFORMIS Druce. Bridport, Dorset, A. W. GRAVESON.

2778. G. PROCUMBENS (Curt.) Dum. West Bay, Fridport, Dorset, A. W. GRAVESON.

†2794. BROMUS RIGENS L. Bournemouth cliffs, in plenty, June, 1922, SHERRIN; Ware, Herts, 1922, DRUCE.

2798. B. MADRITENSIS L. Radyr, Glamorgan, SMITH.

†2799. B. RUBENS L. Cardiff Docks.

†2803. B. UNIOLOIDES H. B. K. Radyr, Glamorgan, SMITH; Hull Docks, Yorks, Miss M. COBBE; Drayton, E. Norfolk, CLARKE.

2807. B. COMMUTATUS Schrad., var. PUBESCENS Druce. Tregehan, Cornwall, THURSTON.

2809. B. ARVENSIS L., var. DUVALI? Wimbledon, Surrey, SHERRIN & ST J. MARRIOTT.

2811. B. HORDEACEUS L., var. LEPTOSTACHYS (Pers.). Killin, Perth, FRASER, teste THELLUNG; dell, Grangetown, Glamorgan, WADE.

†2817. B. JAPONICUS Thunb. Highnam, Gloster, GAMBIER-PARRY; Bristol, SANDWITH.

†2823. LOLIUM MULTIFLORUM Lam., var. PERENNANS A. & G. Iver, Bucks, COOPER, as *siculum*. Var. MUTICUM. Drayton, E. Norfolk, CLARKE.

2828. AGROPYRON PUNGENS R. & S. Ray Island, N. Essex, DRUCE; Walton-on-the-Naze, N. Essex, BROWN.

2830. A. REPENS Beauv., var. LASIORACHIS Hack. Abbey Wood, W. Kent, GRINLING & ST J. MARRIOTT.

†2845. LEPTURUS FILIFORMIS Trin. Coatbridge, Lanark, GRIERSON.

*2850. HORDEUM MARINUM Huds. Kincardine, 1858, *Hb. Bell.* Doubtless an alien.

†2851. H. JUBATUM L. Between Truro and Malpas, Cornwall, Miss TODD.

2854. H. TRIFURCATUM Jacq. Himalayan Barley. Belvedere, near Abbey Wood, W. Kent, POORE & ST J. MARRIOTT.

*2866. EQUISETUM MAXIMUM Lam., var. SEROTINUM Braun. Between Penarth and Cardiff, Glamorgan, 1922, Miss VACHELL.

2867. E. LITORALE Kühl. Between Brookwood and Bagshot on a wet, sandy slope facing south, Surrey, TEMPLEMAN.

2872. E. HYEMALE L. Lordswood, S. Hants, 1912, RAYNER.

2883. ASPLENIUM LANCEOLATUM Huds. Near Carnsore Point, Wexford, STELFOX.

2920. OPHIOGLOSSUM VULGATUM L. South Carr brickfields, Notts, GOULDING.

†*2923. AZOLLA FILICULOIDES Lam. Gold Cliff, J. D. DEAN, ex WADE; below Magor and Undy, Monmouth, REDGROVE.

2927. LYCOPODIUM ALPINUM L., var. DECIPIENS Syme. Great Gable, Cumberland, TEMPLEMAN.

*2941. NITELLA SPANIOCLEMA B.-Webst. Loch Lubnaig, Perthshire, 1921. See Canon B.-WEBSTER in *Journ. Bot.* 149, 1922. New to Britain.

2944. TOLYPELLA INTRICATA Leonh. Pond near Yarnton, Oxon, May 1922, DRUCE.

*2951. CHARA RUDIS Leonh. Loch of Langarnay, Sandy, Orkney, JOHNSTON.

2958. C. DELICATULA Gr. & B.-Webst. Wareham, Dorset, Miss TODD.

HERBARIA.

BY

G. CLARIDGE DRUCE.

The word Herbarium was first applied to works treating of plants, and is said by St Lager to have been used in the fourth century for the *Materia Medica* of Dioscorides, and *The Grete Herbal* of 1516 describes plants and is not a collection of them. Restricted to a collection, indeed, the Oxford Dictionary gives the first evidence as Linnaeus' *Philosophia Botanica* of 1751, and in the third edition of Withering's *Natural Arrangement of Plants* of 1796 directions are given as to forming and storing a herbarium. There are, however, earlier examples, and we have in *Herbarium Diversarum Naturalium* a title affixed to a book of dried plants, often called a Hortus Siccus, made by Gregory, of Reggio, in 1606, a very early use of the name to signify not a printed work but a collection. Penzig says the word *Herbarius* is used on October 27, 1556, in that sense by the great naturalist, Conrad Gesner, in a letter to C. Wolf. If it is difficult to fix the precise date of the first use of the word, the identification of the first maker of an herbarium is also not free from trouble. The garlands of flowers placed in Egyptian tombs do not stand in this category. It is unlikely that during the period in which the nearly impervious papyrus or vellum or parchment formed the writing material that the pressing and drying processes were discovered. It would not be many ages after the introduction of paper, however, before it would be found that a flower pressed between the sheets would dry and retain its shape and sometimes its colour. Perchance between the vellum or parchment sheets of some missal an accidentally pressed flower which the limner had been copying for illumination in the text, may have suggested the process. But it was not until paper was fairly cheap that it would be used for such a purpose. The invention of paper-making appears to have been of Chinese origin. It is known that for a period as remote as two centuries before the Christian era the process was known to that people who prepared it from various substances, such as the stems of rice, leaves of the Paper Mulberry (*Broussonetia*

papyrifera), from hemp, flax, silk, and cotton. The manufacture spread westwards to Persia. In 751 the Arabs in Samarcand obtained, by means of torture, the secret of making it from some Chinese, who had attacked the town, and whom they took prisoners. The Arabs carried this knowledge to Mecca. Thence the Moors conveyed the process to the South of Spain, to a town once called by the Romans Saetabis, but named by the Moors Xativa (now disguised under the name San Felipe Neri) then celebrated for its superfine flax, and where cotton was then and is still grown. By the twelfth century paper, presumably made of linen, was exported from that place to the countries West and East. Elche, with its grove of Date Palms (*Phœnix dactylifera*) is not far away from Xativa, and the aspect of the whole region is distinctly reminiscent of the East. The earliest printed work treating of plants is probably by Bartholomew Glanville, *Liber de proprietatibus rerum*, of 1481. We are now enabled with some accuracy to attribute to Luca Ghini, Professor of Botany at Bologna, the honour of being the first to form an herbarium, for although there are no actual remains in existence we have positive evidence that five of his pupils, two of whom were Englishmen, made such collections of dried plants. From this fact alone we may safely attribute the credit to Luca Ghini. He was Professor of Botany at Bologna from 1534-44, and then went to Pisa where he died in 1556, having handed over to Mattioli all his material—of which no trace is now to be found.

We give one or two early references to collections of dried plants. In 1543 Bartolommeo Maranta (an Italian botanist whose name Plumier applied to the arrow-root yielding genus, *Maranta*), writing to Matthioli (*Lib.* iv.), states:—"Non negaverim plures me dedisse plantarum imagines quae e siccis plantis ad me transmissis delineare curaverim, sed affirmaverim, quod aquae gelidae maceratione contractas e siccitate rugas adeo in iis extenderim, ut hac ratione redivivae et parum admodum a viridibus distantes viderentur," and Amatus Lusitanus, whose real name was Jean Rodrigo de Castell Branco of Coimbra, in Portugal, who had travelled not only in Turkey, but had visited and made friendships with botanists in Spain, Italy, France, Holland, and Germany. When at Ferrara he met Antonio Musa Brasovola, Professor of Physics there about 1542. He was shown John Falconer's book as a singular curiosity

such as he had never seen before. [*Enum.*, Dioscorides 322, 1577.]. Falconer was an Englishman who had studied at Bologna under Ghini from whom, doubtless, he learned the method. Falconer's book is also alluded to by Turner, the father of British Botany, who had also been a pupil of Ghini's. Turner afterwards became Dean of Wells, but the second portion of his Herbal was printed in Cologne in 1562. In it he says of Pistacea (p. 91 bis), "It may chance that Matthiolus hath seen the leues of the forsayde trees of greater or lesse bygnes and of other fasshon and color then they were of that I saw in Bonony (Bologna) whereof I haue certayn at thys day to shewe, well kept in a booke at the lest these seuentene yeares [1562-17=1545], if any man shulde dout of my truth in the rehersall of these maters "—and, again, but still earlier, in the first part of the Herbal printed in England in 1551 under "'Sea Trifoli' Glaux, otherwise called Engalacton," Turner says, "I never saw the true Glaux in England savinge onelye in Master Falkowner's booke and that had he brought out of Italy except my memory do fayle me. I saw it ones in Flanders by ye sea-syde about three miles beyonde Dunkyrke." *Glaux* has been identified by Mr Britten, surely in error, with the Portuguese and Spanish *Astragalus Glaux*, which is not given by Nyman either for Flanders or Italy. The *Glaux* of Cibo is *Anthyllis Vulneraria*, which grows in both countries, which moreover Turner does not record as British. In his *Names of Herbes* of 1548 he also alludes to this plant but does not mention Falconer's book. Therefore we know that from Bologna sprang this new method and we have evidence to show that Ghini sent plants so prepared to Pier Mattioli shortly after the publication at Venice of his *Commentary on Dioscorides* in 1544, a work which ran through many editions. Its author was an Austrian physician, a native of Sienna, who died of the plague at Trient in 1577. So to Ghini is to be ascribed the honour of first preparing Herbaria.

We now propose to deal with two of his pupils—those whose herbaria are the earliest known to exist.

The oldest is that prepared by Gherardo Cibo, which is preserved in the Bibliotheca Angelica in Rome.*

* Enrico Celandi sopra un Erbario di Gherardo Cibo in Malpighia xvi., 180-226. See O. Penzig Contribuzioni alla Storia della Botanica. E. Chiovenda a proposito dell'Erbario di Gherardo Cibo 1904. Ann di Bot. fasc., i. 1903.

Cibo came of an illustrious family. A relation of Pope Innocent. he was born in Genoa in 1512, and went with his father, Aranino Cibo, to Rome in 1526, escaping the slaughter in the 'Sacco di Roma.' With his parents he went to the Duke of Varano at Camerino, and then he came in 1529 as a pupil to Ghini, staying with his uncle, the Cardinal, at Bologna, and was a diligent scholar. In 1532 he accompanied his father, who was sent as Ambassador to the Emperor, Charles V., then at Ratisbon. They travelled through the Trentino and then to Ingolstadt, where he met, in 1533, the great Flemish botanist, Fuchs, with whom he kept up a correspondence and for whom he had the greatest respect. On this journey he collected plants which are in his herbarium (A). In 1534 he returned to Italy to Agrano, near Pisa, with Lorenzo Cibo, Marchese di Massa, and when there doubtless made a journey into the Appian Alps, from which there are specimens in his herbarium. In 1539 he accompanied the pontifical legate, Farnese, to the Court of Charles V., visiting the Monastery of Sysla, near Toledo, and made a rapid journey through Bayonne to Paris and Ghent, which occupied four months. In 1540 he parted company with the Legate and definitely retired to Rocca Contrada in Umbria, making only short excursions during his lengthy life, varied by a brief visit to Rome in 1553. Here, in quiet country pursuits, his time was occupied in making a very beautiful series of plant paintings, which are most delicately finished. His copy of the grand edition of Fuchs *Historia* of 1542 is ornamented by some drawings of considerable merit.* If Mattioli, in his rare edition of 1548, speaks slightingly of Fuchs, Cibo has made a broad dash across the sentence which almost obliterated the criticism and shows how highly he appreciated that great draughtsman, an inspirer of engravers. He was also in correspondence with botanists, and one of his letters is preserved in the Aldrovandi collection dated from Rocca Contrada, March 26, 1578. He died at Rocca Contrada in 1600, aged 88 years. The Herbarium consists of two sets. One, the older, designated by Penzig, A., is more fragmentary, is less well prepared and less well arranged and is doubtless the work of his prentice hand. It is contained in a volume which has suffered much. It was unprovided with guards, so that

* Now preserved in the Bibliotheca Angelica.

when the specimens were inserted it caused the book to bulge so as to expose the contents. The size of the white paper is 32.2 x 19.5 cm. It contained 515 numbered plants (some are now destroyed). They are not arranged in chronological or alphabetical sequence. They consist of native species as well as plants of medicinal and horticultural interest.

Two plants in it leap to the eye—*Zea Mays* and *Opuntia vulgaris* —since here are these two American plants gathered in an Italian garden so shortly after the discovery of America. Both are also represented in Aldrovandi's herbarium and the Maize is represented in Rauwolf's herbarium at Leyden as a specimen gathered by him at Birra, in the Euphrates Valley in 1574. Fuchs figured it in 1542, but as a variety not now in cultivation. The collection includes the orchids *O. militaris*, *O. purpurea*, and *Ophrys Bertolonii*, and excellently preserved specimens of *Anthyllis Vulneraria*, *Anagallis arvensis* and *fœmina* with the colour well retained, *Veronica Chamædrys*, *Mathiola incana*, *Satureia Thymbra*, but this is probably a cultivated specimen, and *Pœdorota Bonarota* among others.

The HERBARIUM B. is in much better condition and contains better specimens. It is arranged in alphabetical order in four volumes, containing about 1347 plants. The scientific name is in Cibo's hand and he has appended the abbreviation for some of the authors cited. It is labelled "Plantarum seu Stirpium Naturalium." The paper is of different makers, with different watermarks. Many of the names used by Cibo are still retained—*Aconitum Lycoctonum*, *Anagallis fœmina*, *Cannabis sativa*, *Chelidonium majus*, *Dipsacus sylvestris*, *Hedera Helix*, *Nymphœa lutea*, *Origanum Onites*, *Trifolium pratense*. It contains many very interesting species.

His *Epipactis* is *Botrychium Lunaria*, his *Filix mas* is *Polystichum*, his *Glaux* is *Anthyllis Vulneraria*.

Altogether 1442 species are represented in the Herbaria, which may be compared with 768 in that of Cesalpino, Girault 313, Rauwolf 973, Aldrovandi 5000. The majority of the plants of Cibo's come from Central Italy, but, as we have said, many are ornamental species from the garden, others are medicinal or useful in the arts. He has also inserted some plants bearing galls, and he has given some of the vernacular names to the species.

Owing to the absence of *Zea Mays* and *Opuntia* from the Herbarium B. we may assume that they were grown in the Bologna garden, which he perhaps did not visit again.

ULYSSES ALDROVANDI.

Much larger than Cibo's collection and only a very little later is that of Aldrovandi, who, like Cibo and Turner, was a pupil of Ghini, which is in existence at Bologna and which it was my great pleasure to see this spring. Before alluding further to the Hortus Siccus some notice of its extraordinary collector may be given, since his early experiences are in a high degree romantic.

Ulysses Aldrovandi, never did a botanist receive a more fitting prenom, was born at Bologna on September 11, 1522. His father, Chancellor-Secretary to the Senate of that city, died when Ulysses was only six years of age. Probably this led to his being a little spoiled by his mother and caused him, bright and precocious as he was, to be self-reliant and probably self-willed. At the age of twelve he was apprenticed to a rich merchant at Brescia, but disgusted with a commercial occupation found his way back to Bologna, where at the entrance to the city, near the Castel San Pietro, he encountered a young Sicilian, who told him he was going on a pilgrimage to the shrine of St James at Santiago de Compostella, in Spanish Galicia, then a most popular pilgrimage, so numerous being the stream of visitors that it gave the popular Spanish name to the Milky Way—El Camino de Santiago. The Saint who attracted these crowds of pilgrims was James, the Son of Zebedee, whose remains were said to have been brought here in the twelfth century. The first cathedral built over the body of the Apostle was built in 874 and consecrated in 899. The Moors at Cordoba, jealous of the reputation of Santiago, made an attack upon it and Al Mansur entered the city in 997 and razed it to the ground. The bells of the cathedral with other booty were brought back by Christian captives to Cordoba, where the bells were hung up reversed as lamps in the great Mosque until Ferdinand restored them in 1236, sending them back to Santiago on the shoulders of Moorish prisoners. So the historic reputation of Santiago with all its romantic accessories dazzled the boy eager for adventure. In his sixteenth year he started on foot on his long journey, thus emulating his Greek forerunner, with the Sicilian, without money or delaying even to enter the walls of colon-

naded Bologna or to bid his mother and friends farewell. They travelled to Modena, Reggio, afterwards the home of Gregory, one of his botanical correspondents, over the hills to Genoa, along the littoral to the harbour of Savona, then without its cathedral, to Nice. They swam the river Var and entered Provence, then occupied with Italian and Spanish troops at war with the King of France. They crossed the Rhone and went through Languedoc, visiting Monpellier, sixty years before the Botanic garden was founded there. Their way led through the mosquito-haunted and dirty Narbonne, with its relics of Roman conquerors, and across a malarious country to the Spanish-looking Perpignan, with its then unfinished cathedral. They determined to reach Barcelona by the Col du Perhus, which had been crossed by the conquering army of Pompey. In the Pass the boys were met by brigands who stripped them naked, taking even their boots and shirts. In very simple and airy attire they reached Barcelona, where reclothed they passed on to the picturesquely situated and renowned Catalonian monastery, where in pure refreshing air they stayed three days to pay their devotions to our Lady of Montserrat. Then they started with renewed zeal for their long tramp through arid Arragon, Navarre, and hot and dusty Castille. Doubtless they passed through Burgos, swept with the bleak winds from the Guadarramas and admired the Gothic Cathedral, whose architect was the English Bishop Maurice, and with dreams of emulating the Cid they eventually reached Santiago and stayed there twelve days, offering their prayers at the shrine of their pilgrimage, and obtained help from the pilgrims. The sea air of the west tempted them, so they walked to Cape Finisterre to breathe the Biscayan breezes, and in order to avoid retracing their steps determined to cross the Galician mountains. For two days they saw no sign of habitation and were nearly starved, living only on such fruits and plants as they found. Nearly worn out with famine and fatigue they reached Valladolid, where Colombus died about 34 years before and when Philip the II., whose birthplace it was, was then about 14 years old. Next they struck out for Marseilles by Zaragossa, through Languedoc. They embarked for Genoa from Marseilles, a voyage not without incident since they were soon pursued by corsairs and obliged to return. Eventually the young Ulysses succeeded in reaching Genoa the Superb, and not caring even then

to return to Bologna suggested a pilgrimage to Jerusalem. His Sicilian companion, having had enough of mendicancy and its privations, decided, if not to return to the flesh-pots of Egypt, at least to go back to the lemon-groves of Sicily, and Ulysses, being left companionless, returned to Bologna, where his mother and brother, Achille, who had long thought him dead, welcomed him with great joy. Here he was induced to stay, and at the University he studied rhetoric, philosophy, mathematics and medicine, among others of the liberal arts, too liberal perhaps, for the authorities sent him to Rome and subjected him to the Inquisition. Released after several months' detention, he stayed in the Imperial city long enough to write a work on the Antiquities of Rome, and had his interest directed to the study of Natural Science owing to his meeting Rondelet, Professor at Montpellier, and Paulo Giovio, celebrated naturalists, then studying Ichthyology. At the age of 28 Aldrovandi fortunately met Luca Ghini at Bologna, who inspired him with a love of Botany, in which subject he instructed him, and one of the MS. lectures given by Ghini (vol. iii, c. 2-106) is still preserved at Bologna. In 1551 with Luigi Anguillaria, the director of the Botanic Garden at Padova, Monte Baldo and two other hills were explored. On his return Aldrovandi stayed at Padova to receive lessons from the celebrated Gabriel Fallopia, and in 1553 he explored the environs of Rimini; the Alvernian mountains, Loreto, Ancona, and the Italian coast of the Adriatic where, for the first time, he collected plants for his herbarium.

Returning to Bologna he obtained a doctorate in philosophy and medicine, and was given the title of lecturer in logic, philosophy and natural history. In 1568 he made the Botanical Garden at Bologna. The care of this, with his herbarium, his museum, and animals occupied his life. His means must have been considerable for he employed two secretaries and three clerks, and he had painters and engravers whom he paid well, but this outlay nearly ruined him. He appealed, and not in vain, to the Popes Gregory XIII. and Sextus V., to the Dukes of Toscany and D'Urbin, and to the Cardinals and Archbishop for aid, and with their assistance he was enabled to produce three volumes on ornithology and one on entomology.

Aldrovandi died on November the tenth 1605, aged 85, having by his will left all his collections, library and MSS. to the City of

Bologna. This bequest included his herbarium, which is preserved in 17 folio volumes of 4,378 sheets of paper. It contains about 5000 specimens. The covers of each volume are of ancient parchment sometimes ornamented with figures. The sheets of volumes 1-14 measure 14 x 21 cm., vols. 15-17 are larger, measuring 23 x 34 cm. The plants have the Latin names attached in Aldrovandi's hand. He quotes such authors as Fuchs, Dodoens, Gesner, Lobel, and Clusius. In the course of three centuries the herbarium has undergone strange vicissitudes. After being preserved for many years in the University Library, in 1796, after the war, the French Republic ordered it to be removed to the Natural History Museum at Paris. At the treaty of Vienna, in 1815, it was ordered that the Herbarium should be restored to Bologna. Then after years of tranquillity it was moved, in 1875, to the Botanic Garden. Now again it is placed in a case in the room set apart in the Library for the works of Aldrovandi, where the MSS., the wood-blocks, and other personalia of Aldrovandi are well and, it is to be hoped, permanently housed. The collection, although it has had such adventurous episodes, is still in good condition, though some of the specimens, especially those in vols. I. and II., have been too liberally poisoned with a strong solution of corrosive sublimate, but the majority may be identified. The first specimen is *Absinthium ponticum Matthioli*, the last in the 17th volume, is *Helxine* seu *Parietaria*. Some bear names which are still valid—*Anagallis foemina*, *Pinus sylvester*, &c. The bulk of them are native plants of Italy and from natural localities, although few, if any, are definitely localised. He gives occasionally the vernacular name, *e.g.*, Herba Sancti Alberti for our St John by the Hedge, *Barbarea vulgaris*.

A detailed list is still a desideratum, although O. Mattiolo in *Malpighia* (xii., 1899) has enumerated those in the first volume.

On the tercentenary of the death of Aldrovandi a catalogue of his MSS. was prepared by Lodovico Frati, with Alessandra Ghigi and Albano Sorbelli, which was published at Bologna in 1907. It contains a portrait of Ulysses copied from that in the first volume of the *Ornithologia* of 1599, and there is also a reproduced page of his writing. The catalogue of his MSS. extends to 208 pages. There are in the collection letters from Gregory of Reggio, Cibo, Fabio, Colonna, Lobel, Robin, Luca Ghini, Mathioli, Gherardo Cibo, and

the chief contemporary botanists, and from Popes, Cardinals, Grand Dukes and other notabilities. There are still preserved many coloured paintings of animals, plants, flowers and fruits, which are also catalogued.

A biography of Aldrovandi, to which I am greatly indebted, was written by Giovanni Fantuzzi under the title *Memorie della vita di Ul. Aldrovandi*, and was published at Bologna in 1774. Further very important details are given in Saint-Lager's *Histoire des Herbiers*, published in 1885, Camus *Hist. des Premiers Herbiers*, 1895, and I am also greatly indebted to Dr B. A. Longo, of the Botanical Department, and to the keeper of the Bologna Library for great kindness. There can be no doubt that the Herbarium of Aldrovandi is the most important of the early collections, and that it appears to be actually the second oldest in the world. His name is commemorated in the monotypic Droseraceous genus *Aldrovanda*, which was dedicated to him by Monti of Bologna in 1747, and subsequently adopted by Linnaeus. The name of Monti himself is connected with the genus *Montia*.

It is now necessary to account for the third Italian pupil of Ghini who prepared a Herbarium, but in the interim one was made in France which takes precedence because it is five years older. This was made by Jean Girault, a native of Lyons, a celebrated surgeon and a pupil of the botanist, Dalechamp, who may possibly have heard of the method from Cibo. This collection was begun on August 4, 1558, and contains 313 specimens chiefly of Lyonnais plants. It is preserved in the Jardin des Plantes at Paris and consists of a volume bound in parchment covers. This passing notice must suffice and we proceed to allude to the Herbarium of Andrea Cesalpini who was born at Arezzo in 1519, and died at Rome in 1603. A pupil, as we have said, of Ghini, he began this collection in 1563 (he had two, but one is lost). This is much smaller than that of Aldrovandi, consisting only of 768 plants. It is titled " Illustratio in Hortum Siccum A. Caesalpini," and is now preserved at the Botanical Garden at Florence. It was originally dedicated to Alphonse Tornabuoni, Bishop of Florence. It then passed into the possession of the Pandulphi family where it rested unrecognised until 1717, when the great botanist, Micheli, discovered it in the Pandulphi Palace, and made use of it. Again the Herbarium was

lost sight of till 1818, when it was found by Octave Targioni in the Nencini Library, the Nencini family being the heirs of the Pandulphi. Then, in 1844, it was presented to the Natural History Society of Florence, and, under the care of Parlatore, the celebrated author of the *Flora Italiana*, the plants were poisoned and distributed into three volumes. It consists not only of native plants of Tuscany but of cultivated specimens. On each sheet Cesalpini has written the Greek, the Latin, and the vernacular name. It must be remembered that Cesalpini was not only a field botanist, but that he was the father of systematic botany, and one of the earliest to elaborate a system (*De Plantis*, 1553, dedicated to Francis, Duca de Medici) based on the structure of the fruit and seed—the foundation of the Natural System. Like his Hortus Siccus, its merits remained buried for over a century, but if his herbarium had been readily consultable this neglect could hardly have occurred since it is arranged in a very natural manner illustrating his views. It is true that he was saturated with the Theophrastian idea of grouping together all shrubs and trees irrespective of the seed or fruit structure. This, too, was done by Morison, a century later. The herbaceous plants, however, are naturally arranged, that is, the Umbelliferae, Valerianaceae, Boraginaceae, Compositae (with which he united the Dipsacaceae), Graminaceae, Cyperaceae and Juncaceae, Labiatae, and so on, are brought together—a great forward step, and one that was not followed by the generality of botanists of that or indeed the immediately succeeding era. In the *De Plantis* he was the forerunner of Harvey in the discovery of the circulation of the blood. Speaking of the arterial system he says the blood "per arterias in universum corpus distribui." Plumier named the beautiful genus of the Leguminosae *Caesalpinia* after him, and Linnaeus adopted it in his *Genera Plantarum*.

CENTAUREA SCABIOSA L.
VARIETIES AND A HYBRID.

C. E. BRITTON.

The varieties and fluctuations of *Centaurea Scabiosa* L. have hitherto not received as much attention as they deserve from botanical writers and collectors in Britain. Messrs Marshall and Shoolbred observed at Tongue Bay, Sutherland, in 1897, a very peculiar form with more or less undivided leaves, and again collected it at the same locality in 1900. This form was described by Marshall under the varietal name *succisaefolia*, in allusion to the resemblance of its basal leaves to those of a luxuriant local form of *Scabiosa succisa* (*Journ. Bot.* 1901, 268). A few years later the Rev. H. J. Riddelsdell distributed examples of a similar plant collected on cliffs on the Welsh coast, where he had first observed it as early as 1897. In the meantime Mr F. N. Williams had published part 2 of his *Prodromus Fl. Brit.* (Nov. 1901), in which the plants collected by Messrs Marshall and Shoolbred were referred to the earlier-published var. *Gelmii* Briquet, and two other varieties were added, var. *coriacea* (= *C. coriacea* Waldst. & Kit.) and var. *angusiensis*, the latter founded on plants in Herb. Brit. Mus. collected by George Don on the coast of Angus-shire, and identified by him as *C. intybacea* Lam. & DC.

These varieties of the *Prodromus* merit enquiry as it appears doubtful whether any one of them can be maintained for the plants indicated.

(1) "β. *coriacea* (Wald. & Kit. (sp.) Pl. rar. Hung. ii., p. 212, t. 195 (1805); (var.) Koch Syn. Fl. Germ. Helv. ed. 1, p. 412 (1837). —Folia glabra, margine scabra. Periclinium fere glabrum." The definition of this is identical with that used by botanists from Koch to Beck. British plants collected (1) by Rev. W. H. Painter at Worle Hill, Somerset, and (2) by Mr Chas. Bailey between St Andrews and Kinkell Ness, are thus identified. The specimens, which are in Herb. Brit. Mus., do not agree with the description given, as it can plainly be seen in each case that the leaves are *not* glabrous, but are on both surfaces clothed with short, rough hairs. As to the

name *C. coriacea* Waldst. & Kit., Hayek has arrived at the conclusion that it cannot be upheld. His reasons are given *in extenso* in *Centaurea-Arten Osterreich-Ungarns* p. 45, 1901, where it is said that the original examples of this in Willdenow's herbarium consist of specimens of *C. Scabiosa* L., and *C. Sadleriana* Janka, and the figure of Kitaibel to represent undoubted *C. Scabiosa* with broader and less rough leaves than usual. For the *C. coriacea* and *C. Scabiosa*, var. *coriacea* of many German and Austrian botanists, the name *C. Fritschii* was established by Hayek. It is a plant with very narrow segments (40-50 mm. long by about 5 mm. wide) in the upper leaves, and is said to be readily distinguished from typical *C. Scabiosa* by the more coriaceous texture of the foliage, glabrous above, and also by the narrower, marginal membrane of the phyllaries. No British plants at all resembling this form have come under observation. The distribution is from Styria to the north-west of the Balkan peninsula.

(2) " var. γ. *angusiensis* mihi.—This plant is the reputed *C. intybacea* of G. Don, with stems more branched than in the type. The original specimens, which are in the British Museum Herbarium, I have examined and compared with other Scottish forms. . . . . ." It is difficult to understand why the character of stems more branched than in the type should be attributed to Don's specimens as these certainly do not show such a feature. There are two examples on one sheet, one with an unbranched stem with one terminal capitulum, the second with a terminal and two lateral peduncled capituli. Quoting from Smith's *English Flora* iii., p. 468, the author of the *Prodromus* says :—" It has deeply furrowed and narrowly divided foliage." Smith, however, did not use the word " furrowed." Don's specimens do not show any especial feature to take them away from ordinary *C. Scabiosa*, and the use of a varietal name is not justified.

(3) " var. δ *Gelmii* Briq. in Bull. Herb. Boiss. p. 475, 1897." In Herb. Brit. Mus. is a fine series of Marshall's plant from the herbarium of the Rev. E. F. Linton. A study of them reveals a character that prevents them being associated with Briquet's variety but, to make this clear, it is necessary to refer to that author's arrangement of the forms of *C. Scabiosa* in *Mon. Cent. Alp. Marit.* pp. 180, etc., 1902. There two groups are recognised :—" A. Bord

scarieux des écailles involucrales à franges médiocres ne cachant pas l'involucre. B. Bord scarieux des écailles involucrales à franges allongées (2-3 mm.), moins foncées que dans A, parfois argentées, cachant ± l'involucre. Calathide souvent plus grosse que dans A." Section A contains var. *Gelmii*, among others, whilst section B includes var. *alpina* Gaud. (*C. alpestris* Heg. et Heer). Marshall's Tongue Bay plants show the involucres more or less closely covered by the black appendages, consequently the name *Gelmii* cannot rightly be applied to them, and it will be necessary to use instead for the Scottish and Welsh plants the name originally used by Marshall—var. *succisaefolia*. With this view Mr C. C. Lacaita, who has seen a series of the Welsh form, is in complete agreement. In Britain the variations presented by *C. Scabiosa* are innumerable; the leaves may be undivided or multifid; the stems short and simple or tall and much branched; the pericline roundish or ovoid-elongated, glabrous to conspicuously arachnoid; the florets may be purple or white or pinkish; the stems and leaves may be roughly hairy or sub-glabrous or glabrescent, etc. Some of the phases are transitory; others permanent, such as the undivided leaves of var. *succisaefolia* and of the parallel form, var. *Gelmii*, which transmit their peculiarities to their offspring.

f. *discoidea* Uechtr.—Capituli devoid of marginal radiant florets. —Of occasional occurrence, Surrey, etc.

f. *cretacea* Wörlein—Phyllaries densely arachnoid, Surrey, etc. Oxon (Bullingdon) Dr Druce. Ref. No. Z 830.

f. *dumetorum* Beck—Phyllaries small, brownish, acuminate, teeth short, irregular, wavy, densely arachnoid; upper surface of leaves copiously punctuate, segments of upper leaves linear. v.-c. 29, Cherry Hinton (Herb. Riddelsdell); v.-c. 33, Whelford (Herb. Riddelsdell); Surrey, E. Kent, Hunts, Berks (Herb. Druce); Oxon (Herb. Druce). Seldom typical. The segments of the upper leaves are frequently linear-oblong; the appendages black, rather than brown, and the tomentum disappears as the autumn advances. The punctuation appears constant.

Var. *silesiaca* Borbas—Phyllaries terminating in a conspicuous, more or less spreading, spine. = *C. Scabiosa* L., var. *spinulosa* Koch, non *C. spinulosa* Rochel.—Surrey, N. Hants (C. E. Palmer in Herb. Druce).

Var. *Riddelsdellii* var. nov.—Capituli small (2 cm. by 1.5 cm. in herb.), borne on simple, conspicuously elongated branches (12 to 20 cm.), naked above or with rudimentary leaves; pericline ovoid; phyllaries appressed, acuminate, slightly spinulose; appendages black, concealing greenish phyllaries; teeth light brown or whitish.—Gloucester: Crichley Hill, Rev. H. J. Riddelsdell (see *Rep. B.E.C.* 826, 1919). A plant collected at Radyr, v.-c. 41, by Mr Riddelsdell is almost identical with the Crichley Hill plant which appears to be rayless.

f. *incisa* C. E. Britton—Leaves pinnatisect; rachis very narrowly winged, hirsute, segments spaced, oblong or elliptical, acute, narrowed at base, lobate-serrate, pubescent above, thinly hirsute beneath.—S. Essex and Cornwall (Loydell in Herb. Druce); v.-c. 33, Herb. Riddelsdell.

f. *multifida*.—Leaves bipinnatisect; rachis narrowly winged above, scarcely or not at all towards the base, hirsute, segments triangular or rhomboid, sub-petioled, lobes oblong or lanceolate, dentate-pinnatifid, strigose above and on principal veins below; segments of lower leaves densely imbricated. This form with much-divided leaves cannot be var. *dissecta* F. Gérard (Rouy Fl. Fr. ix., 146) as that is described as having coarsely hairy leaves with linear divisions, besides being a small plant, whereas f. *multifida* is twice the size given.—Surrey.

f. *heterophylla* Beck—Lower leaves undivided, elliptical, tapering into the petiole, acute, irregularly serrate-dentate, or even somewhat lobed, upper leaves pectinate-pinnatipartite.—Yarnton, Oxon (Herb. Druce); Surrey.

Var. *Gelmii* Briq.—The following description is taken from *Monographie des Centaurées des Alpes Maritimes* by Dr John Briquet. " Plante haute de 30-50 cm. Feuilles basilaires oblongues ou oblongues-lancéolées, aiguës ou subobtuses au sommet, d'un vert de mer, parfois rougeâtres, convertes sur les deux faces de poils courtes, rudes, épaisses, indivises, irregulièrement crénelées-dentées; les supérieures plus étroites et plus courtes, lyrées ou faiblement pennatilobées à la base d'ailleurs indivises. Calathides dans a! à fleurs cependant plus petites." Surrey: Effingham; cultivated specimens [Ref. No. 1841] distributed by the writer through the Botanical Exchange Club.

Var. *succisaefolia* Marshall in Journ. Bot. 268-9, 1901.—Basal leaves numerous, lamina undivided, oblanceolate or elliptical, entire, serrate, dentate, or serrate-dentate, subacute, 10-15 cm. long, more or less hispid, especially on the midrib below, narrowed into a petiole about as long as the lamina; lower stem-leaves undivided, petioled, upper sessile undivided, or more usually pinnatifid at base, lobes two or three pairs, oblong-linear; stems from 10 to 90 cm., simple or branched, branches few (2-3); capituli variable, more or less globular, 2-3 cm.; pericline black, or variegated yellow and black, according to the degree of development of the membraneous edge of the phyllaries. The description of this variety given by Marshall and the allusions to it by Messrs Marshall and Shoolbred in *Journ. Bot.* 170, 1898, fail to draw attention to a conspicuous feature seen in herbarium specimens. Numbered exsiccata are not quoted, as Marshall's specimens bearing identical numbers do not always agree. Taken as a series, the capituli are remarkable for the way in which the green portions of the phyllaries are hidden by the dark appendages, in some completely, in others less so, and again, there are specimens that are transitional in this respect. Before the capituli were subjected to pressure during drying it is extremely likely that all showed the black appendages closely covering the phyllaries. It is therefore suggested that the varietal name *Gelmii* cannot be applied to the Sutherland plants, and for the present we must use the name given by Marshall. The diagnosis of var. *integrifolia* Gaudin Fl. Helv. 5, 404, 1829, " foliis lanceolatis pleris-que indivisis superioribus pinnatifidis " certainly covers all the British plants that have been referred to var. *Gelmii*, but Briquet rejected the name of Gaudin for the plants to which he applied the name *Gelmii*, for the reason that the leaves of the latter are not entire but clearly crenate-dentate, and, moveover, Gaudin did not describe the character of the pericline of his var. which is probably synonymous with *C. alpestris*, var. *simplicifolia* Reut. Cat. pl. vasc. Genève 119, 1861. The Rev. H. J. Riddelsdell's plants from cliffs on the coast of Glamorgan were accepted by Marshall (see *Rep. B.E.C.* 231, 1906) as var. *succisaefolia*, of which they have the general characters, differing chiefly in their dwarf size, the stems ranging from 15 to 30 cm. The capituli are solitary or geminate on the unbranched stem, or two or three branches may be developed. The

stem-leaves are fewer in number, the capituli either closely covered by the black appendages or, if less covered, then with teeth much longer than in the Scottish plants, and conspicuous by their whitish colour. It is among these Welsh plants that the development of the black appendages completely concealing the green phyllaries reaches its maximum. Although these plants possess the characteristics of the Sutherland plants from which they cannot really be kept apart, yet they strikingly recall *C. alpestris* Heg. et Heer. Besides typical forms of var. *succisaefolia*, both Marshall and Riddelsdell recorded plants intermediate in leaf characters between this and normal *C. Scabiosa*, attributing the same to possible crossing of the forms. Unfortunately, the form of *succisaefolia* from Melness, on the west side of Tongue Bay, is but scantily represented in the herbarium at South Kensington, so it is not quite certain at present whether it is identical with the form from Coalbackie.

A very curious plant with deeply divided leaves and small capituli is apparently an unrecorded hybrid between *C. Scabiosa* L. and *C. nemoralis* Jord. × *C. cantiana* mihi. Stem about 50 cm., simple below, corymbosely branched above. Cauline leaves about 17 cm., sessile, interruptedly pinnatipartite, largest segments 35 mm., lanceolate, entire or serrate, apiculate, smaller segments 4-7 mm., deltoid to oblong-acuminate or apiculate; segments decreasing in size towards the base of leaf, becoming crowded and semiamplexicaul. Rameal leaves numerous, sessile, linear, lobed or toothed only at the base. Branches simple or sparingly branched, the lowest 12-18 cm. long. Capituli inconspicuously radiant, pericline ovoid, yellowish-green and dark-brown, arachnoid, in dried condition not exceeding 2 by 1.5 cm.; appendages brown; disk triangular, about 3 by 2 mm., teeth about 2 mm. long; florets purple. This plant recalls in habit, size, and shape of capitulum, *C. nemoralis* Jord., for which indeed it was gathered as a form with phyllaries remarkably exposed. The interruptedly pinnatipartite leaves, however, are quite unlike any known in the *nigra* group, and can only be attributed to the influence of *C. Scabiosa*, as likewise must a character seen in the lower phyllaries, where the appendages are slightly but distinctly decurrent.—W. Kent—on the hills near Luddesdown. Dr Druce has identified various specimens in his herbarium with var. *melanocephala* Herb. Fl. Ing. 338. *C. melanocephala* was established by Pancic in Fl.

Princ. Serb. (1874) a work that, being in a Slavonic tongue, is inaccessible to me.

In the preparation of this paper I have had placed at my disposal the extensive collections from the herbaria of Dr Druce and Rev. H. J. Riddelsdell, to both of whom I am especially indebted. Messrs C. C. Lacaita, W. R. Sherrin, curator of the South London Botanical Institute, and A. J. Wilmott, have also rendered valuable assistance.

SOME NEW ENGLISH SPECIES OF TARAXACUM.

By H. Dahlstedt.

T. Drucei Dahlst., n. sp.

Folia plurima, laete viridia, tenuia, in pagina superiore saepe passim maculata, utrinque glabra, petiolis angustis et inferiore parte nervi mediani roseo-coloratis, oblonga-lingulata obtusa-obtusiuscula, lobis crebris brevibus latis integris, breve et obtuse dentatis triangularibus (deltoideis) obtusiusculis-subacutis, lobo terminali in foliis exterioribus brevi rotundato-obtuso, in foliis interioribus longiore obtuso.

Scapi plures, basi apiceque leviter colorati, glabri.

Involucrum atroviride parum, sat angustum, basi ovata.

Squamae exteriores adpressae ovatae—anguste ovatae-acuminatae, acumine ± lato obtuso (± fimbriato), conspicue albo-marginatae, interiores lineari-lanceolatae, apice ± latiusculo coloratae.

Calathium c. 70 mm. diametro, sat radians.

Ligulae luteae, marginales extus stria fuscopurpurea ± lata notatae.

Antherae polliniferae.

Stylus luteus, stigmatis fuscis.

Achenium (vix maturum) 3.5 mm. longum, 1 mm. latum, angustum, basin versus sensim attenuatum, p. majore p. inferiore laeve, apice ipso ± breve spinuloso cito in pyramidem 0.5 mm. longum conicam abeunte.

Rostrum 7 mm. longum.

Pappus albus.

A very distinct species, surely belonging to Spectabilia and allied to *T. spectabile* Dt. and *T. unguilobum* Dt.

The plant was gathered by me in April 1914 at Kenmare, Kerry, and it occurred in some plenty in the glen near the house of the late Mr R. M. Barrington at Fassaroe, Bray, Co. Wicklow. I sent it to the Club (see *Report* 152, 1914) as allied to *spectabile*. As will be seen Herr Dahlstedt thinks it sufficiently distinct to warrant its being separated. In September 1921 I gathered it in good flower at Killarney. G. C. DRUCE.

T. JOHNSTONII Dahlst., n. sp.

Folia plurima, firmula, supra obscure viridia, subtus pallidiora, nervo mediano, anguste lanceolata — oblongo-lanceolata, multiloba lobis crebris plerumque valde hamatis et saepe valde retroversis, integris praesertim summis vel in margine superiore ± acute dentatis, interlobiis nullis vel brevibus ± dentatis, lobo terminali ± sagittato in foliis exterioribus plerumque sat parvo, breve acuto, vel mucronato, vulgo integro, in foliis interioribus majore—sat magno interdum ± dentato.

Scapi glabri, basi apiceque leviter colorati.

Involucrum breve, crassum, atroviride, basi ovato-rotundata.

Squamae exteriores ± et saepe late ovatae, ± longe acuminatae, leviter—sat conspicue albido-marginatae, interiores lineari-lanceolatae, angustatae.

Calathium c. 35 mm. diametro.

Ligulae eximie luteae, marginales extus stria ± conspicua purpurea notatae.

Antherae polline carentes.

Stylus cum stigmatibus mere luteus.

Achenium subfulvum, c. 3.25 mm. longum, 1.5 mm. latum, p. majore p. laeve v. breve tuberculatum apice ± longe et acute spinuloso in pyramidem cylindricam v. conico-cylindricam ad 1 mm. longam subito abiens.

Rostrum (7.5-) 8-9 mm. longum.

Pappus albus.

Loc. Orkney:—Links of Merkady, Durness, Mainland, Westland of Walkmill Bay, Orphir; Hall of Tankerness, Saint Andrews (H. H. JOHNSTON).

This species seems also to belong to Spectabilia and to be in some degree related to *T. unguilobum* Dt.

T. FULVIFORME Dahlst., n. sp.

Folia plurima, tenuia, glabra, laete viridia, subtus pallidiora, petiolis angustis et inferiore parto nervi mediani leviter coloratis, lineari-lanceolata—anguste oblonga lobis crebris ± brevibus et ± hamatis, integris vel superioribus in margine superiore ± dentatis, ad angulos et in interlobiis saepe ± fusco-colorata, lobo terminali in foliis exterioribus brevi, triangulari-sagittato mucronato vulgo integro, in foliis interioribus saepius sat magno sagittato marginibus ± convexis integro v. saepius ± dentato, mucronato.

Scapi glabri basi apiceque ± colorati.

Involucrum parvum ± atroviride, basi ovata.

Squamae exteriores adpressae ± late ovatae—ovato-lanceolatae, acuminatae, ± albido-marginatae, paucie sub apice callosae, interiores lineari-lanceolatae, sub apice ± callosae vel breve et obtuse corniculatae.

Calathium sat obscure luteum, 25-30 mm. diametro.

Ligulae angustae, marginalis extus stria obscure purpurea notatae.

Antherae polline carentes.

Stylus cum stigmatibus fuscus.

Achenium ± rubiginosum-testaceum, 3 mm. longum vix 1 mm. latum, inferne laeve vel breve tuberculatum, apice breve et ± late spinulosum, subito in pyramidem conicam, 0.75 mm. longam abiens.

Rostrum 7-7.5 mm. longum.

Pappus albus.

Belongs undoubtedly to Erythrosperma and seems to be related to *T. fulvum* Raunkier.

Near Don Bridge, 1909 [No. 4106]; St Ouen's [Z. 6]; La Moye, Jersey; Oxford [Y. 99]; Bracknell, Berks, 1918 (modif.); Roundstone, Galway, September 1921, G. C. DRUCE; Colley Hill, Surrey (as *erythrospermum*, see *Rep. B.E.C.* 465, 1909), C. E. SALMON; Buffet Wood, Banstead, Surrey, W. A. TODD; Porthkerry, Glamorgan, 1912; H. J. RIDDELSDELL in *Rep. B.E.C.* 267, 1912, and Kniveton, Derby, 1895, W. R. LINTON, both probably this; Easegill rock crevices, Lancs, W. WILSON.

T. OXONIENSE Dahlst., n. sp.

Folia plurima, saturate viridia, subtus pallidiora, glabra, exteriora lineari-lanceolata—lanceolata, profunde lobata, lobis angustis, longis, ± acutis ± patentibus, superioribus superne lacinulis longis cum interlobio angusto ± dentato confluentibus, inferioribus brevioribus sed magis angustis et distantibus, superioribus longioribus minus distantibus, omnibus acutis, interlobiis angustis ± dentatis-lacinulatis, lobo terminali ± hastato in foliis exterioribus sat parvo apiculatis apice obtusiusculo-subacuto, in foliis interioribus majore magis triangulari acuto, lobulis lateralibus valde patentibus et angustis, petiolis angustis sat longis cum nervo mediano ± lucide violascentibus.

Scapi breves, vulgo quam folia breviores ± colorati, glabri-glabriusculi.

Involucrum breve, atroviride, basi rotundato-truncata.

Squamae exteriores breves adpressae ± ovatae—ovato-lanceolatae in apicem obtusum-obtusiusculum contractae v. acuminatae, ± albido-scariosae apicem versus saepe ± violascentes, interiores lineari-lanceolatae ad apicem saepe ± coloratae.

Calathium c. 35 mm. diametro, sat plenum (?).

Ligulae flavae marginales extus stria rubro-purpurea notatae.

Antherae polline carentes.

Stylus et stigma flavescentes.

Achenium haud notum.

Loc. Oxford [X 27]; Quenvais, Jersey, 1910, G. C. DRUCE.

Belongs probably to Erythrosperma but it is necessary to know the fruit before definitely placing it.

Miss I. M. ROPER'S *T. officinale*, var. *obliquum* (see *Rep. B.E.C.* 576, 1916) from Tockington, W. Gloster, seems to belong here, as does, or may, Mr W. A. TODD'S Surrey specimen from Potsden Lacey [N. 384], 1911.

T. TANYLEPIS Dahlst., n. sp.

Folia obscure viridia, subtus pallidiora, sub-glabra—pilosiuscula, ± remote lobata, interlobiis praesertim inferioribus angustis ± dentatis, exteriora lobis brevioribus ± triangularibus lobo terminali brevi triangulari, interiora lobis inferne parvis valde angustis acutis superne ± longis subangustis triangularibus—hamatis acutis inferiori in pagina superiore ± dentatis summis

vulgo integris lobo terminali majore—maximo sagittato, integro v. basi inciso breve acuto, petiolis angustis et nervo mediano ± coloratis.

Scapi plures, ± colorati et saepe passim araneosi-pilosi.

Involucrum mediocre, sat angustum basi ± ovata.

Squamae exteriores ± recurvatae-reflexae, inferiores angustissime lineares ± dilutae, caeterae lineares—lineari-lanceolatae in apicem acutum sensim protractae angustissime marginatae, interiores magis obscurae lineares sub apice ± callosae.

Calathium c. 40-45 mm. latum, radians.

Ligulae sat obscure luteae, marginales extus stria obscure violaceae notatae.

Antherae polline carentes.

Stylus luteus.

Stigma luteum.

Achenium adhuc ignotum.

Loc. Sweyn Holm, Orkney (H. H. JOHNSTON).

Belongs to Vulgaria.

T. VALDEDENTATUM Dahlst., n. sp.

Folia laete viridia in interlobiis saepe ± fusco-maculata, subtus pallidiora nervo mediano ± pallido, supra parce subtus paullo crebrius et breve araneoso-pilosa, anguste sat late lanceolata v. interiora ± oblongo-lanceolata, ± longe et abrupte lobata, interlobiis ± longis et angustis v. ± latis, sat crebre—creberrime et saepe longe dentatis, lobis longis saepius ± reflexis et saepe hamatis, inferioribus angustis, intermediis latioribus longe acutatis, apicibus recurvatis-subporrectis, lobis superioribus magis integris, lobo terminali in foliis exterioribus ± triangulari-sagittato v. subhastato ± integro apice ± longo et ± acuto lobulis basalibus acutis et longis in foliis interioribus majore et latiore, saepius ± dentato-denticulato.

Scapi plures p. maxima p. cupreo-violacei, glabri v. parce araneoso-pilosi.

Involucrum mediocre, olivaceo-viride, basi ± ovata.

Squamae exteriores anguste lanceolatae, sat longae, ± anguste albido-marginatae, ± acuminatae, ± reflexae, interiores lineari-lanceolatae, sat acutae apice purpurascentes.

Calathium c. 35-40 mm. latum, parum radians.

Ligulae luteae, sub-angustae, marginales extus stria purpurea sat lata ornatae.

Antherae polliniferae.

Stylus fuscus.

Achenium fusco-olivaceum, c. 3 mm. longum, 1 mm. latum in pyramidem 1 mm. longum abrupte abiens, p. majore p. breve, summo apice breve et sat late spinulosum.

Rostrum 7-8 mm. longum.

Pappus albus.

Loc. Wimbledon and near Malden, Surrey, W. A. Todd; Frilford, Berks, 1912, G. C. Druce.

Belongs to Vulgaria.

T. naeviferum Dahlst., n. sp.

Folia plurima, supra laete viridia, subtus pallidiora saepe in interlobiis, et passim secus nervum dorsalem ± laeto violascentem ± fusco-maculata, supra glabra, subtus praesertim in nervo dorsali ± araneoso-pilosa, oblongo-lanceolata—lanceolata, crebre lobata, lobis ± triangularibus, inferioribus longioribus et angustioribus, in utroque margine ± et saepe valde dentata, superioribus latioribus minus dentatis v. integris, saepe subhamatis, lobo terminali in foliis exterioribus brevi, ± triangulari-sagitta+o obtusiusculo-subacuto integro, in foliis interioribus sat magno ± sagittato—hastato-sagittato p. majore inf. parto ± crebre et irregulariter dentato.

Scapi plures, inferne ± rubro-violacei, superne ± viridescentes v. apice magis coloratae, sparsim v. saepius sub involucro ± araneoso-pilosi.

Involucrum mediocre, sat latum, basi ± truncato-ovata, atroviride.

Squamae exteriores intimae et extimae ± lanceolatae, intermedia ± late lanceolatae—ovato-lanceolatae, sensim acutatae, in pagina exteriore atrovirides, in interiore ± atro-violaceae, ± patenter recurvatae, interiores angustae, lanceolatae, acutae.

Calathium c. 45-50 mm. diametro, ± radians.

Ligulae luteae, ± angustae (subcanaliculatae ?), marginales extus stria lata purpurea notatae.

Antherae polliniferae.

Stylus fuscus.

Achenium ± olivaceum, angustum, 3.75 mm. longum, c. 0.5 mm. latum in pyramidem 0.5 mm. longum sensim abiens, supra medium latissimum, basin versus sensim angustatum, pro majore p. inferiore breve, superne breve spinulosum.

Rostrum 7-7.5 mm. longum.

Pappus albus.

Loc. Wimbledon, W. A. Todd.

Belongs to Vulgaria.

T. subundulatum Dahlst., n. sp.

Folia plurima, laete viridia, exteriora angusta, linearia—linearilanceolata lobis brevibus angustis v. superioribus latioribus, acutis, integris vulgo ± patentibus (apicibus saepe subporrectis), interlobiis ± angustis dentatis sejunctis, lobo terminali brevi ± dentato, intermedia brevioribus—longioribus, magis crebris integris v. ± dentatis, interlobiis brevioribus ± dentatis, intima lobis latioribus ± dentatis, superioribus crebrioribus et saepe latissimis ± integris, lobo terminali lato magno obovato-sagittato subintegro—grosse dentato, lobulis basalibus latis brevibus.

Scapi plures basi apiceque leviter colorati.

Involucrum mediocre, obscure olivaceo-viride, basi ovata.

Squamae exteriores primo erectae-patentes sub antheri patentes v. ± recurvatae, anguste ovatae—ovato-lanceolatae, obtusae—obtusiusculae in pagina interiore saepe ± violascentes, haud marginatae, interiores lineari-lanceolatae apice contracto obtusiusculae—obtusae.

Calathium c. 45 mm. latum, sat plenum.

Ligulae obscure luteae, sat latae, marginales extus stria obscure violacea notatae.

Antherae polliniferae.

Stylus et stigma fuscescentes.

Achenium badio-olivaceum, c. 3.5 mm. longum, 1 mm. latum, basi angusta sublaeve v. ± tuberculatum, apice versus latius breve et sat late spinulosum abrupte in pyramidem c. 0.5 mm. longam conicam abiens.

Rostrum 9-11 mm. longum.

Pappus albus.

Loc. Hailey, Oxon, G. C. DRUCE.

Belongs to Vulgaria and is related to *T. undulatum* Lindb. f.

T. LATISPINA Dahlst., n. sp.

Folia plurima, ut videtur laete viridia, subtus pallidiora, exteriora et intermedia v. omnia ± angusta, lanceolato-linearia lobis subhamatis v. superne hamatis, angustis—sat latis, acutis, integres v. interdum in margine superiore denticulatis praedita, interlobiis inferne sat longis, angustis, superne latioribus et brevioribus sparsim dentatis sejunctis, lobo terminali ± sagittato brevius—longius mucronato, subglabra v. praesertim in nervo dorsali ± rubro-violascente saepe parce araneoso-pilosa, petiolis ± coloratis, interiora latiora ± oblonga lobis latioribus et superne latioribus, paucioribus, inferioribus ± denticulatis, interlobiis brevioribus, lobo terminali magno, ± sagittato, vulgo integro, marginibus valde convexis, ± obtuso—obtusiusculo breve mucronato, lobulis basalibus saepe valde retroversiis.

Scapi basi apiceque ± colorati parce v. praesertim sub involucro densius araneoso-pilosi.

Involucrum sat magnum, olivaceo-viride basi ovata.

Squamae exteriores mediocriter longae ± late anguste ovato-lanceolatae—lanceolatae, extus ± obscure olivaceo-virides, intus ± violascentes, sensim acutatae, interiores ± lineari-lanceolatae, acutae—acutiusculae.

Calathium 35-40 mm. diametro.

Ligulae luteae, sat angustae, marginales extus stria purpurea notatae.

Antherae polliniferae.

Stylus fuscus.

Achenium badio-rufescens, c. 3 mm. longum, 1 mm. latum inferne breve et sat dense tuberculatum superne late spinulosum, in pyramidem brevissimum, vix conspicuam cito abiens.

Rostrum c. 10 mm. longum.

Pappus albus.

Loc. Oxford Park [Y. 51, 46]; Hailey, Oxon [Y. 103, 105]; Princes Risborough, Bucks [Y. 44], G. C. DRUCE.

Belongs to Vulgaria. Seems to be allied to *T. mucronatum* Lindb. f.

THE WANDERINGS OF THE GROUNDSEL.

By James Small, D.Sc., Ph.C., F.L.S.,
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Reprinted from Proceedings of the Belfast Natural History and Philosophical Society, 1920-1921.

The Groundsel, *Senecio vulgaris*, is commonly regarded as only one species; that single species, however, includes a miscellaneous group of about one hundred microspecies, and for the purpose of this lecture the name "Groundsel" is extended beyond that familiar canary food to all its relatives which are included in the genus *Senecio*. Taking "Groundsel" as synonymous with *Senecio*, we deal, not with one species, but with about 2,500 species, ranging over all the habitable surface of the earth, and with a type which may be regarded as older than the Alps and Himalayas.

At a period which is variously estimated as from 4 millions to 40 millions of years ago none of the existing high mountain ranges were in existence. As the earth began to emerge from what is known as the Cretaceous Period, the western parts of South America were flat, and the region of the Amazons was covered, as it is to-day, by a very mixed, dense forest. The few herbaceous and semi-shrubby plants which grew in such forests were epiphytes or climbers, and amongst the semi-shrubby climbers were the ancestors of the groundsel. This ancestral type still lingers in the same region, as the genera *Siphocampylus* and *Centropogon*, which are relatives of the little blue *Lobelia* of herbaceous borders and window-boxes.

About this time a great uplifting movement began which ultimately gave rise to the Andes and, later on, to the Rocky Mountains. This new range of mountains abutting on the tropical forests of the Amazons presented an entirely new habitat, which was open to colonisation by such of the forest species as could survive the change from a rich, warm, moist environment to the more or less arid conditions of the mountain side.

The Lobelioid climbers were amongst the early colonists; descending the trees, or rather failing to find trees upon which to climb, they first became scramblers on the low bushes of the forest edge. Then as they spread year by year up the hillside beyond the tree-limit to beyond the limit for bushes, they became ground-growing

scramblers. The severe conditions reacted upon these pioneers, producing stunted growth and general crowding together of all parts of the plant. The stems being short, the leaves were crowded; the flower-stalks being short or altogether absent the flowers became crowded. The general tendencies towards the production of such characters as hairy appendages to the style branches, tails and apical appendages to the anthers, a few ovules or only one ovule in each ovary, etc., became expressed more fully in the flowers, and since these were already grouped in dense clusters, something very like the flower-head of a Composite was the result.

The young flowers being protected by the green leaves surrounding the flower-head, the calyx became useless, and disappeared at an early stage. The windy arid conditions on the hillside caused the development of hairs on most parts of the plants, and the hairs on the top of the young fruits grew longer than those lower down on the fruit. In this way there was formed the *pappus*, which proved very useful. The hairs, developed in response to the dry windy conditions, when organised as a fringe on the top of the fruit, became more than protective. They caught the wind, more or less like an expanded umbrella; and because they did *not* form an unbroken surface they were much more effective than a purely sail-like mechanism. These hairs, now called the pappus, made it possible for even a slight breeze to blow the light fruits to considerable distances.

The groundsel, therefore, may be said to have been originated by the uplifting of the Andes, and it proved eminently suited for the arid windy mountainous regions, where it still flourishes in great profusion. *Senecio* was, in fact, developed by the mountains with the mountains for the mountains. It arose by the modification of certain Amazonian Lobelioids towards the end of the Cretaceous Period, and started out on its many and long wanderings with an equipment of structure and constitution which was pre-eminently suited for mountaineering. As a natural consequence it usually took the " high " road in its travels.

Being spread by the wind both up and down the mountain slopes it reached to snow-level on the one hand and to the bush country around the forests on the other, and it naturally underwent corresponding changes. Near the snow-level it became even more densely compact and much more hairy, giving rise to the edelweiss and cud-

weed type. On the lower slopes, which were both warmer and more moist, the hairs of the pappus ceased to be developed as such and underwent various changes into awns and barbs which proved to be advantageous for dispersal by forest animals. Thus the groundsel gave rise to the bur-marigold and sunflower type. With these two South American progeny it then moved along the Andes southwards to Tierra del Fuego, and northwards to where the Rockies were beginning to appear in what are now the United States and Mexico.

On reaching the southern part of the Rockies *Senecio* developed, in part, long appendages to the style branches and became slightly modified in other ways, giving rise to the goldenrod and Michaelmas daisy type. By this time the Eocene Period was well-advanced and mountain ranges were beginning to appear in Asia and around the Mediterranean end of the Great Central Sea. The Yablonoi, Altai and Thian Shan ranges and the mountains of Afghanistan, Persia and Asia Minor formed one path stretching from close to the northern end of the Rockies to the Mediterranean region. While the Yablonoi, Khin gan, Sin-Ling and Himalayan ranges formed another similar path through China and Northern India to Asia Minor. Spurs from the latter path led through the Malay Peninsula and Sumatra to Australia, and also *via* the Philippines and New Guinea to the island continent.

Our wandering groundsel, showing its original liking for the " high " road, took both the main Asiatic paths, after coming north along the Rockies and crossing the Alaska-Siberian bridge. The wide, wet or frozen plains in the north were not congenial and these far-stretching paths were not colonized to any great extent, but the routes taken can still be traced by certain species. *Senecio altaicus*, for example, occurs along the first path from Siberia to Turkestan; *S. Ligularia* occurs along the second path.

The Mediterranean region, the next halting place, formed at this time the eastern end of the Great Central Sea which, by gradual draining and drying up in succeeding ages, formed at one end the semi-desert regions around Mesopotamia and Northern Africa, and at the other end the similarly arid Mexican plains. On reaching the warm woodlands, which at the end of the Eocene covered the many eastern islands of this primeval sea, our changeful groundsel in part again lost its pappus and by a few other slight changes developed

the corn marigold type (*Chrysanthemum* and its allies chamomile and yarrow). Other colonies of groundsel in the same region about the same time developed by mutation a split down the back of the corolla, which with some slight accompanying changes gave rise to the lettuce and dandelion types.

The conditions in this early Mediterranean zone were so different from those of the original home and of the paths of migration of the groundsel that, within the next geological period (Oligocene) still another set of changes took effect on the colonist giving rise to the elecampane and golden samphire type. This offshoot arose by an increase in the number of ray florets on account of the rich soil and favourable conditions for luxuriant growth; but very soon, geologically speaking, this same type developed into thistles by reason of the considerable drying up of the eastern end of the Great Central Sea and the resulting hot dry climate.

Meanwhile the descendants of the groundsel in its original home, multiplying, spreading and undergoing various slight changes in response to new and more favourable conditions, gave rise to other new types such as *Trixis* and *Gerbera* in Brazil. In the succeeding geological period (Miocene) the same Amazonian region was the scene of the origin of several still newer types, such as *Liabum*, *Vernonia* and hemp agrimony (*Eupatorium*). About the same time in Mexico the Michaelmas daisy type gave rise to the true daisy (*Bellis*) and some of the Mexican groundsels developed into the French marigold type (*Tagetes*), mainly as the result of the first stages in the drying-up of the western end of the Great Central Sea.

Before the Pliocene period was well begun an extensive migration took place southwards along the mountains of eastern Africa; not only the groundsels but the golden samphire and edelweiss types took part in this movement. South Africa was at this date beginning to become largely a semi-desert region, and such conditions had their inevitable effects on the last type, which originally came from near the zones of eternal snow on the Andes. In South Africa it gave rise to the "everlasting" type (*Helichrysum*). A little later on in the wooded regions which still occurred along the rivers, some of the groundsels lost their pappus and developed other means of dispersal, just as had happened before under such conditions in Brazil, Mexico and the Mediterranean. In South Africa this change

was in some cases accompanied by the sterilisation of the ovaries of the central florets of the flower-head; and the products were first the South African marigold (*Ursinia*) and afterwards the ordinary marigold (*Calendula*).

Towards the end of the Pliocene period the wet, cold conditions obtaining on the northern plains of Asia yielded a belated derivative of the groundsel, the butter-bur and coltsfoot type, where the flowers are developed underground in the autumn and emerge only at blooming time in the spring.

An interesting case of convergent evolution occurred quite recently (Middle Pliocene, about a million years ago) in South Africa. There the colonists descended from the "everlasting" type on the one hand and from the golden samphire type on the other became so extremely alike that their progeny are classed together in the same small division of a tribe of the main Compositae family.

Perhaps the most remarkable point of all is this—the original groundsel type was equipped with such an adaptable constitution, such an efficient dispersal mechanism and such a strong vitality that it survives to the present day in all the regions to which it wandered. It flourishes amongst its numerous progeny, sparsely along some of the northern paths of migration, abundantly wherever conditions have been sufficiently favourable to allow of the development of that great number of individuals which often accompanies the origin of new types. Its 2,500 species exhibit every variety of herbaceous, shrubby and arboreal growth, but with this amazing range of vegetative form the structure of the flower-head and of the individual flowers remains constant even in microscopic details.

Such is the story of how the Groundsel wandered from its Andine home all over the surface of the earth, giving rise to numerous colonies, each of which developed its own peculiar characteristics, so that in time the highest and largest family of flowering plants, the Compositae with its 2,500 species, came into being. The story, here told very briefly and imperfectly, is as worthy of an epic as the wanderings of Ulysses or the travels of Marco Polo; in fact, all the wanderings of primeval men are dwarfed into hurried events of recent and local interest in comparison with these journeys of the Groundsel in which about sixty million square miles were traversed in some forty million years.

BOTANISING IN NORWAY.

BY

G. CLARIDGE DRUCE.

Five weeks were spent in the summer in Norway, and as many of our members wished to have a slight sketch of the route followed and the species met with I submit the following: premising that as it was my first visit to Scandinavia, I felt that I had to get acquainted with the country and its customs before making a definite study of its flora. Prebendary Burdon and T. Churchill were my companions. We decided not to take any of the cruises which would too much limit us to the coast but to take our tickets from place to place so as to be quite untrammelled, a slightly more expensive method, but having great advantages. We travelled from Hull to Christiania in an excellent boat of the Ellerman-Wilson Line. Travellers must have passports and visas and we recommend them to obtain the former direct from the Foreign Office and the latter from the respective Consulates. Expense and time will thus be saved. Possibly before next year these vexatious restrictions will be removed. Bennett's, the tourist agents at Christiania, are obliging, and they will supply tickets for any kind of route. It is well to secure a ticket for a place when making a long journey as the trains are crowded. The train meals are good. Norway is a "dry" place so far as spirits go, so it is well to take a brandy flask in case of illness. Lager beer and a good dark brown ale are to be obtained, but the ale is rather gouty, especially when it is combined with a richer diet than ordinary British food. We reached Christiania on Monday morning. On that day the museums are closed so we spent a delightful afternoon on the fiords winding in and out among the islands, seeing *Anthemis tinctoria*, *Lysimachia thyrsiflora* and other interesting species on the banks, and *Potamogeton filiformis* in the water. We started early the next morning for a long railway journey to the Dovrefeld, through beautiful and varied country. We reached Hjerkin at dusk, but not too late to see *Carex atrofusca* growing in turf on the railway embankment, and *Astragalus alpinus* in plenty by the roadside. One ought to have said we were entirely ignorant of the language, and that the only botanical book we had with us

was Lindman's excellent *Sveriges Flora*, in Swedish. The hotel is about a mile from the station, and is situated in a large open stretch of upland country, at an altitude of 3140 feet. Like most of the Norge hotels this one is built chiefly of timber, and is scrupulously clean. The meals are plentiful. The chief meal is taken about 2 p.m., supper being at 8 and breakfast 8.30-9. Milk is supplied in large jugs which are put on the table for the guests who drink copiously of it with their meals. Butter of good quality and eggs are in plenty. The meat is often stewed, and there is an abundance of dried salmon, sausage, anchovies, sardines, brawn, and other cold meats. Fish is often served cold, but is beaten to a pulp, passed through a sieve, and mixed with a certain portion of potato flour and then made into a shape which is not unusually that of a fish. It is also served hot and is palatable and digestible. It makes an excellent dish. Fruit juice is supplied with milk puddings and sometimes there are stewed blaeberries or, rarely, the excellent cloudberries. Strawberries were often given as a dessert. In fact for gouty people the diet is perhaps a trifle too good. All this is by the way, but it was a pleasurable surprise to find, instead of the rough plenty I had been led to expect, the cleanest of hotels, comfortable beds, and plenty of excellent well cooked food, Need one wonder, therefore, that we gave up for this year the idea of visiting Sweden and Denmark, which was our original intention, and determined to spend the whole of the time in Norway. This resolution was not made until we reached Trondjhem, or we should have spent four or five days more on the Dovrefeld, and then might have climbed the slopes of Snehatten, a mica-slate mountain 7770 feet high, which is visible from Hjerkin. As it was, our time was all too short in this rich botanising centre. The doorsteps of the hotel had *Poa glauca* growing out of them. Close by in the turf was *Agropyron violaceum*, which seems identical with the Ben Lawers plant. We walked along the old road leading to Kongsvold and climbed the adjacent hill, 4500 feet high. It was a botanical garden. The conspicuous plant was *Astragalus alpinus*, but the British rarities we saw on our way included *Thalictrum alpinum*, *Arabis alpina*, *Draba incana*, *D. rupestris* (but a larger plant than the Breadalbane one), *Silene acaulis*, *Lychnis alpina* (also larger than the Forfarshire plant), *Cerastium alpinum* in several forms, *C. nigrescens*, *C. ceras-*

toides, *Sagina saginoides*, but although *procumbens* was there I saw no *S. scotica*—another argument in favour of *scotica* being distinct —*Arenaria uliginosa*, often luxuriant, *Geranium sylvaticum*, plentiful on the moorland, *Potentilla Sibbaldi*, *P. Crantzii*, *Rubus Chamaemorus*, *Dryas*, *Epilobium alpinum*, *E. alsinifolium*, and *Saxifraga aizoides*, with orange-brown coloured flowers. *Linnaea* and *Cornus suecica* were abundant in the wooded parts with *Unifolium* (*Maianthemum*) *Bifolium*. The Composites included *Erigeron borealis* and *Gnaphalium norvegicum*, which seems a good species. It is very rare in Britain as I have only seen it from Lochnagar, Ben Wyvis and Corrie Li in East Ross. In Norway it is widely spread and scattered. We also saw *Antennaria dioica*, var. *rosea* and var. *pedicellata*, *Saussurea*, *Hieracium alpinum*, and other Hawkweeds in great variety. Other plants seen included *Bartsia alpina*, *Oxycoccus quadripetala* and *microcarpa* with *Andromeda*, and growing in the bogs *Tofieldia*, *Carex pauciflora*, *C. magellanica* (much of our British '*magellanica*' is not the true plant which is extremely rare in Britain), *C. limosa*, *C. rariflora*, *Kobresia*, *C. lagopina*, *C. polygama*, *C. capillaris*, *Juncus alpinus* and *Deyeuxia neglecta*. On our moorland road, which we have temporarily left, we saw *Gentiana nivalis* in great beauty and *Menziesia caerulea* in abundance—the latter a frequent species in Norway. Here, too, we saw the Norwegian *Primula scotica*, but it is not identical with the Caithness plant. *Veronica alpina* was common and *V. saxatilis* in great beauty. *Euphrasia borealis* was frequent. The *Bursa pastoris* there is *brevisiliqua* Almq. In the moorland swamps grew immense quantities of *Betula nana*, and its hybrid was also frequent. The willows included a rare hybrid, *Salix herbacea* × *lapponum*, *S. lanata*, *S. Myrsinites*, *S. reticulata*, *S. herbacea* and *S. lapponum*. Of the Rushes *Juncus castaneus*, *J. trifidus*, *J. triglumis* and *J. filiformis* were common. In addition to the sedges mentioned *C. atrofusca* was abundant, and there was also *C. atrata*, *C. alpina*, *C. pauciflora*, *C. vaginata* and *C. rigida*. *Eriophorum alpinum* grew in the moorland swamps. *Phleum alpinum*, *Poa irrigata*, *P. pratensis* in several forms, *P. glauca*, *P. alpina*, *Deschampsia alpina*, *D. cæspitosa*, var. *brevifolia* were abundant and *P. laxa* local. *Poa palustris* grew near the hotel where *Asperugo procumbens* was adventive. *Equisetum pratense*, *E. umbrosum* and

Lycopodium annotinun were also noted. Near Kongsvold, and in the Druva ravine, we saw *Saxifraga cernua*, *S. cæspitosa* (again not like the Westerness plant), *Carex rupestris*, and a rich variety of plants. Of the non-British species *Aconitum septentrionale*, with its dull purple flowers, was conspicuous in the uplands, and the feathery heads (now over flower) of *Anemone vernalis*. A glorious sight was a pasture full of *Papaver radicatum* in all tints from deep orange to pure white. It was worth the journey in the fresh, keen, mountain air to see its beauty, and amid such surroundings, the rushing river, the sombre ravine and the distant snow fields. *Draba magellanica* was local and *Viola biflora* rare. In the bushy places grew the yellow flowered *Astragalus frigidus* and the violet-blue flowered *A. oroboides*. An extraordinary looking species is *Wahlbergella* (or *Lychnis*) *apetala* with its large inflated calyx. The small, white-flowered *Arenaria scandinavica* was local, as was *Stellaria borealis*, but *Silene rupestris* grew at Kongsvold and is a common feature throughout Norway. *Saxifraga adscendens* (which some botanists put under *tridactylites*, but the two plants are abundantly distinct) and another plant near our *S. nivalis*, *S. tenuifolia*, *Sedum annuum*, *Erigeron uniflorus*, and *Artemisia norvegica*, the latter a very distinct species, were all new to us, as was *Antennaria alpina*. On the hill-side about 4500 feet we had the delight to meet with *Cassiope hypnoides* which, as its name suggests, has a moss-like foliage, with short stalked, pure white, globular flowers like pearls. To this we paid our devotions. It grew with *Menziesia*. The Gentians included *G. tenella*, *G. islandica* and *G. suecica*. Neither of the two latter is our Shetland plant. *Androsace septentrionalis* was local. Two species of *Pedicularis* with pale yellowish flowers were obtained. In the lower woods grew *Alnus incana*, a very frequent but small tree in Norway, *Salix glauca* and *S. hastata*. Orchids were few but *Habenaria obtusata* was new to us and *H. Gymnadenia*, *H. viridis* and *H. bifolia* (a small form) occurred. The Sedges included the very distinct *Carex capitata*, *C. microglochin* (which ought to be found in Britain), and the very curious *C. parallela*. *C. brunnescens* (a near ally of *canescens*) is common in sub-alpine places in Norway, and on the Dovrefeld we first made acquaintance with the true *C. cæspitosa* L. which is densely tufted, has a narrow, but very rigid, flowering spike with spikelets small for the size of

the plant. It is widely spread in Norway. *Trisetum subspicatum*, a handsome and peculiar grass, at first suggesting a *Koeleria*, was local. Here, too, we made our acquaintance with *Epilobium lactiflorum* (a very distinct species not in the least like *alpinum*) and *E. dahuricum*, which does not seem identical with our British *E. palustre*, var. *lineare*. In an upland wood, at about 3800 feet, a small plant like a deformed *Montia* attracted attention and for some time I was puzzled. At last it dawned upon me that it was the Polygonaceous plant *Koenigia islandica* but I never saw it elsewhere in Norway. *Eriophorum Scheuchzeri* adorned the bogs. This list, and it is by no means an exhaustive one, will give some idea of the riches of the Dovrefeld and one can cordially recommend it to our members. We then went to Trondhjem, arriving after 12 at night, where we were luxuriously housed at the Phoenix Hotel. A delightfully cooked dinner was enjoyed, and there was a small but excellent and not too noisy orchestra. So much for roughing it in the north! The city is clean and picturesque; there are good shops; and a general air of prosperity. We made a pleasing motor-run to see the two great waterfalls of the Nid called the Lerfossen, about 5 miles away, and beautiful they were. The adjacent wood has *Struthiopteris* and a striking form of *Carex flava* with large long-beaked fruits. *Heracleum sibiricum* grew near the splendid Cathedral.

We also went up a hill on the other side of the city to the Fjeldsaeter from which most splendid views of the southern snow peaks and the distant Dovrefeld are obtained. We saw Skistuen and the ski station is near. There is some good, boggy and heathy ground on the way up where we were enabled to see the true *Orchis maculata* (*ericetorum*), identical with our Scottish plant. *Eriophorum alpinum* was also observed as well as *Unifolium*, *Viola palustris* and *Carex binervis* in what seemed to be a new locality. *Pyrus fennica* also grew in the woods. On the rocks at the summit we saw a curious looking, Saxifrage-like plant. It is the *Diapensia lapponica* which we were glad to obtain, although the corolla had fallen.

Another day was occupied in visiting some very picturesque lakes near Jondsvandet. In the boggy ground there grew *Carex diandra*, *C. limosa*, *C. polygama*, *C. flava*, var. *œdocarpa*, *C. canescens* and *Deyeuxia stricta*; in the lakes, *Nymphaea pumila*, *Sparganium affine*; in wet woods *Lycopodium annotinum* and *Mulgedium*

alpinum in fine growth, and in thickets a pretty grass, *Calamagrostis purpurea*, *Agrostis alba*, var. *gigantea*, and *Melampyrum pratense*, var. *hians* Druce. The Norwegian Bracken is different from ours, their plant being glabrous, with flatter and larger divisions of the frond. It is of a more lucent green and it seems well worthy of subspecific rank. It is the true *Pteridium aquilinum* Kuhn, our plant is the var. *lanuginosum* (Bory). I saw none of the British form in Norway. Mr Burdon thought the two were specifically distinct. The north-west of Scotland should be searched for the glabrous plant. A walk was made on the northern side of the fiord where on the rocky cliffs *Epilobium collinum* was common. It is widely distributed in Norway and has quite a different facies from *montanum*, its nearest ally. *Ajuga pyramidalis* was seen, but over flower. It is quite distinct from *reptans* and *genevensis*. The mystery is how they came to be confused.

From Trondjhem we took a small steamer to Molde. Leaving in the evening we reached Molde about noon, after a pleasant voyage. After lunch we had a pleasant stroll round the bright looking town, and climbed a hill to see the glorious view of the fiord. Then we embarked and had a most pleasing journey through the fiord to Aandalsness. We drove about two miles further on in order to stay at the beautifully situated Park Hotel, where the hostess was unwearied in her endeavours to make us comfortable. The place would be very pleasant for a prolonged stay. The table was a most hospitable one, but we were called away at dinner to see an alpine glow which turned the magnificent Romsdal Horn into a ruby cone and the patches of snow on the hills caught the fire. Beyond Romsdal is the still more lofty Vengetinder. My companion told me that one of the rarest British plants grew outside the tennis court and there, in a deep gully, grew a splendid colony of *Mulgedium*. Not to be outdone I took him just across the road to some boulders on which grew splendid tufts of *Asplenium septentrionale* and *Woodsia ilvensis*. On the mountain screes grew rosettes of *Saxifraga Cotyledon* of which flowering specimens grew on the vertical cliffs. The excavation for a contemplated railway yielded quite naturalised *Bromus arvensis* and *B. inermis* in luxuriant growth. Farther up the valley we found *Calamagrostis arundinacea* and *C. Epigeios*. The side of the fiord afforded *Scirpus rufus* and

uniglumis and the ditches *Utricularia minor*. We traversed a lateral valley in order to climb to the snow but the walk yielded little. But the view of the Romsdal Horn and its attendant hills was magnificent. From Aandalsness we took a boat to Vestnaes, and then motored through a Scotch moor-like country to Søholt pleasantly situate and with a good hotel. The botany here was quite good. In the pastures grew the orange-flowered *Arnica*, making a goodly show. We had a pleasant walk through the country bordering the fiord and found *Alchemilla subcrenata*, *Melampyrum silvaticum*, *Habenaria bifolia*, and *Polygonatum verticillatum*, and by the shore *Calamagrostis purpurea*, *Carex salina*, var. *cuspidata*, and *C. norvegica*, new to us.

From Søholt it was a delightful sea journey through the Sunelv Fiord and thence up the grand Geiranger Fiord, with its stupendous cliffs and numerous waterfalls, to Merok which we reached at dusk. We decided to stay at the Utsigen hotel which was two miles away and over a thousand feet in altitude. The extraordinary road, with its hair-pin bends, had to be ascended in the darkness with only the light from the motor's searchlights. It made it look appallingly dangerous. Below us in the magnificent Geiranger Fiord lay two of the pleasure-trip steamers brilliantly lighted as the passengers were having a dance. From our bedrooms, which opened on to a balcony, we could hear the strains of the band and what was more pleasant, the roar of a waterfall, which was about a quarter of a mile away, which sounded loud at times and low at times as the wind rose or fell. I think the view which we obtained in the early morning from this place is to be reckoned among the great views of the world.

We found on the precipitous cliffs below the hotel splendid *Saxifraga Cotyledon* with sprays of flowers a foot long. It was used as a table decoration. There, too, we had *Mulgedium* and *Silene rupestris* was in evidence on dry rocks. A most lovely walk up the pass gave us fine examples of *Gnaphalium norvegicum*, *Cornus suecica* in magnificent fruit, and *Unifolium* in good flower owing to the retardation of its flowering season by the higher altitude. *Impatiens Noli-tangere*, *Asplenium septentrionale* and *Woodsia ilvensis* were common. A couple of days passed all too soon and then we motored from Merok to Grotli. Formerly this took twelve hours

in the old carriages. Now there is a good road. As one ascends towards the head of the gorge the outlet seems blocked, but by a daring bit of engineering the road climbs by a succession of hair-pin bends to the top of the pass, 3500 feet in altitude, the water-shed of the Gudbrandsdal and the western fiords, where one is close to the snow. Where it had melted the tiny blue flowers of *Veronica alpina* appeared with *Epilobium alpinum* and other small alpines. From the top of the pass to Grotli the scenery is bare and bleak in the extreme. A lake was passed on which were floating masses of ice. The hotel at Grotli is well situated in this dreary expanse. Formerly there was an encampment of Lapps near by, but they have gone north. However, there are many reindeer on the hills, a relic of the Lapps, but we only found an antler or two, nor did we meet with bears although *Arctostaphylos Uva-ursi* and *alpina* were plentiful. The hotel stands in an alpine situation and within a stone's throw from the terrace might be found *Gnaphalium norvegicum*, *G. supinum*, extremely fine *Cerastium Cerastoides*, *C. nigrescens*, *C. alpinum*, *Epilobium lactiflorum*, *Carex lagopina*, extraordinarily plentiful; *C. atrata*, *C. vaginata*, *C. saxatilis*, *C. brunnescens*, *Poa laxa*, *Hieracium alpinum*, *Sagina Saginoides*, *Agrostis borealis*, *Juncus castaneus*, *J. triglumis*, *J. alpinus*, *J. filiformis* and *Luzula spicata*. We climbed the next day to the ice and found much of interest including *Melampyrum pratense*, var. *purpureum*. The adjacent lakes, affording good fishing, were grand and so were the mosquitoes.

From Grotli a long motor drive to Hjelle was made which took us through ice and snow with fine hills on each side. Here, too, was a lake with floating masses of ice. Driving sleet and a dense mist did much to mar the pleasure of the day. *Ranunculus glacialis* showed its reddish-pink flowers through the gloom. We descended to Hjelle by another series of hair-pin bends where one has to trust to the driver's skill, and wonderful drivers they are. The car seems to aim at a stone post; there is nothing in the way of a wall as a protection to the road, and when within a couple of feet of destruction the car is swung round in an appalling swerve, and you are on to the next bend before you can say 'Jack Robinson!' At any rate we safely reached Videsaeter and Hjelle after passing through a most wonderful gorge with masses of the snowy blossoms of *Saxifraga Cotyledon*. We went by a boat down the Strynsvand

one of the most lovely of lakes, to Mindresunde and then by motor-boat to Visnæs. Then we motored to the excellent Hotel Alexandra at Loen where we had most delightful rooms looking up to the glaciers in the stupendous valleys near. The motor road, cut out of the cliff, from 50 to 100 feet above the fiord, was perhaps as dangerous as, if less exciting than, the descent of the pass, but it was extremely beautiful. Next day we varied by having the old-fashioned and now fast disappearing Stolkjarre, a small vehicle holding two in front, while the driver stands on a bar behind and directs the pretty fawn-coloured steed. Our object was to climb to the glacier about 10 miles away so we drove to Vassenden, took the steamer down the Loenvand to the end of the lake, drove for some distance and then climbed the rough mountain-side to the ice of the glacier called Kjendalsbrae. On the moraine we found *Arabis petraea*. Olden, with its curious church, was also visited and there we found *Limosella* in plenty.

Our next journey was from Loen by boat to Sandene up the Gloppenfiord where we were most comfortably housed. The hotel has electric heating, with a cuisine which left nothing to be desired. The view from the hotel over the upper portion of the fiord with the snow-clad hills well wooded at the base was most charming. Our first expedition was to see the great waterfall of the Eidsvoss from which the spray is carried for some distance. Washed by this spray grows *Ranunculus reptans*, identical with the Loch Leven plant. We walked round the head of the fiord and on the muddy shore found *Limosella aquatica* and growing with it *Tillaea aquatica* like the Adel specimens. Here, too, was what Prof. Holmboe named *Cochlearia anglica*. The weather here was rainy but an exploration along the fiord afforded *Ligusticum scoticum* (common) and, on a rocky bank, *Allium oleraceum*. The daughter of Mr Ryg, hotel-keeper, had made a collection of local plants, but there was little in it that we had not seen. We cannot too highly speak of the hotel.

We took a motor from Sandene for the long journey to Vadheim on the north side of the Sognefiord. We passed through pine-woods, and then by a road cut out of the cliff along the lake side and through gloomy mountain gorges where on the rock-fall screes grew immense quantities of the Parsley Fern, recalling the screes of Ben Nevis. Then we reached Skej,

then a long lake, the Jølstervand, and a fine waterfall, the Huldrefos, and then Førde with its rushing river, and after a delightful run reached Vadheim where we embarked on the boat for Bergen. The passage was propitious and we reached Bergen without anxiety but had a wrestle to get rooms at the imposing looking Hotel Norge. We met with the inevitable *Matricaria suaveolens* on waste ground and saw the sights of the pleasantly situated but extremely rainy city —the Portree of Norway. We soon made arrangements to take the romantic railway as far as Trengereid and then motored to Norheimsund, a most exciting journey as the road was cut out of a cliff which formed the eastern side of a great defile. It had no protective wall so that one looked down slopes of appalling steepness a thousand feet or more to the stream below. The road occasionally went through a tunnel. The rocks showed *Saxifraga Cotyledon* and the less steep slopes in places were covered with the graceful *Struthiopteris*. That day before reaching Norheimsund we passed three splendid falls. Norheimsund is a very attractive place. Despite a shower we went to the Øfsthusfos, behind which is a tiny path which takes one between the fall and the rock over which it plunges. Near the village we saw, on one group of rocks, *Scleranthus perennis*, with *Woodsia*, *Asplenium septentrionale*, *Sedum annuum* and, near by, were *Centaurea Jacea*, *Arenaria trinervia* with smaller leaves and more floriferous than our own, *Hieracium Auricula* and *H. scandinavicum*.

From Norheimsund we took a steamer to Utne on the fiord of that name, whence four other fiords radiate to the four points of the compass. There we took the boat up to Odda on the Sørfiord, where we had excellent quarters in very beautiful surroundings. The great carbide works near are now closed so the smoke from them which once hid the beauty is no longer a serious annoyance. Odda is much indebted to my old friend, the Principal of Hertford, who spent many summers there. We made an excursion to the great glacier, the Buarbrae, only 1000 feet above the fiord, and here I saw *Potentilla norvegica* and robust *Arabis hirsuta*. We also motored from Odda to the great waterfall, the Laatefos, situate in most beautiful surroundings. Just opposite, on the other side of the valley, is the still more graceful Espelandsfos, and close to the Laatefos is the Skarsfos, the waters of which unite near the bridge with the Laatefos, and we saw rainbows innumerable from the spray

which drenched the road and incidentally ourselves. We then drove on to the Gorfsvingane, a most wonderful ravine. We reached the top of the water-shed, about 3300 feet, above Odda—a pretty good climb for the morning's work. Thereabouts we had some excellent botanising for we found *Saxifraga rivularis*, *S. caespitosa*, *Cardamine bellidifolia*, *Veronica alpina*, *Bartsia alpina*, *Agrostis borealis*, *Carex saxatilis*, *Stellaria borealis*, *Hieracium convolutum*, and a host of other rarities.

From Odda we went to Eide on the Hardanger Fiord, and thence by motor (30 kilos) to Voss, passing through Spruce woods and the profound valley of the Skjervet with its imposing waterfall, the white spray in splendid contrast with the black slate rock over which it pours. The hotel at Voss is palatial. The Kaiser, in his palmy days, presented it with three of his signed pictures. But more pleasing to us was the walk by the Vangsvand lake where we found *Woodsia alpina* and *ilvensis*, *Limosella*, *Subularia* and *Barbarea stricta*. From Voss we took the evening train for Bergen and left the next day for Newcastle by the Venus, but a soiled and unpleasing goddess she was, and the landing arrangements and the stupid Custom-house troubles were a great contrast to the methods of our foreign friends. Really ours are a disgrace to a civilised country. Nor did the 7s 6d cab fare from the landing stage to the railway station add any degree of pleasure to the proceedings.

The result of our visit was that I noted 650 species growing in Norway, of which 45 were new to me. It must be remembered that plants were sought in the places we visited—we made no special quest for any. There is no space here to praise the beauty spots, but one may say that the scenery is of the highest order. One takes this opportunity of acknowledging the uniform courtesy and kindness we received from the people, and from Professor Holmboe, who gave most valued assistance on plant determination.

VARIATIONS IN THE VEGETATION ALONG THE OUTCROP OF THE LAWERS-CAENLOCHAN SCHIST.

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The botanist, travelling in the Highlands of Scotland, is struck by the sharp contrast in the colours of the mountains. Some are green from base to summit, others are purple to varying altitudes. This contrast is most apparent in the vicinity of the outcrop of the Lawers-Caenlochan schist which, though not always exposed, extends from the Isle of Jura on the west to Clova in north-west Forfarshire in the east. Where this formation outcrops in the Highlands, as it does in Beinn Laoigh, Beinn Heasgarnich, Cam Creag, Meall nan Tarmachan, Creag an Lochan, Ben Lawers, Ben Vrackie, Caenlochan, Canness, and Clova—to mention a few, the mountains are green. On the other hand, the Paps of Jura and Schiehallion are of the purple type. That this local difference is not due to climatic factors is evident from the fact that both types appear in close proximity. An investigation of the edaphic factors at work helps to solve the problem. The Lawers-Caenlochan Schist, or sericite schist as it is sometimes called, is rich in mineral salts, chiefly lime, and has associated with it other horizons alike rich—the Black Schist and the Hornblende Schist. These rocks weather readily into a rich soil not merely on account of their chemical composition but also because of their physical properties, for they disintegrate to form a porous soil with suitable water-holding capacity and adequate aeration. The rocks of the purple hills are chiefly quartzites and quartz-mica schists, and are therefore poor in salts. Their friable nature and the instability of their screes also tend to produce a poor soil. To instance one example in the western Breadalbanes, Beinn Laoigh and Meall Odhar confront each other across the valley of the Conenish near Tyndrum. The former is mainly an outcrop of the Lawers-Caenlochan Schist, the latter chiefly quartzite and quartz-mica schist. The former presents an area of alpine-grassland merging downwards into grass moorland, the latter is carpeted on its sum-

mit with *Loiseleuria procumbens*, a plant not found on Beinn Laoigh; its flanks are heather-clad and its moors are of the acid type.

The general appearance of the vegetation of the Lawers-Caenlochan schist has thus been indicated as a distinctly noticeable feature in the Highlands of Scotland. Its vegetation is rich and lush, and its soil is peculiarly suitable for the development of an Arctic-Alpine Flora. P. Macnair, in *Trans. Perth. Soc. Nat. Science*, vol. ii., 1898, concludes thus:—"Our contention that in this band of sericite schist . . . we have one of the most important factors in determining the distribution of our alpine plants and that wherever this band of schist rises to a sufficient altitude, there these plants have been enabled to maintain existence in the great struggle which has exterminated them from the plains." The above publication is supplemented by a sketch map showing the areas of the outcrops. A large number of arctic-alpine plants are common to all the mountains of the Highlands of Scotland; but in addition to these are several of the rarer boreal plants which are to be found along the outcrop of the Lawers-Caenlochan schist. Further, the study of three distinct areas along the outcrop has revealed some interesting variations in its vegetation. (F. Buchanan White, J. H. Balfour and others have already commented upon the variations between the flora of Ben Lawers and that of Clova.) The areas selected for comparison here are:—

1. Beinn Laoigh (3708 ft.), at the western extremity of the Breadalbanes, on the borders of Perthshire and Argyllshire, the actual summit being in the former county.
2. Ben Lawers (3984 ft.), in Perthshire, overlooking Loch Tay —the Mecca of Scottish Arctic-Alpine Botanists.
3. Clova, in N.-W. Forfarshire—the home and haunt of Don and his "reputed discoveries."

For information regarding the above see the publications in the *Journal of Botany*, *The Annals of Scottish Natural History*, by Dr Druce, P. Ewing, etc. See also the *Transactions of Perth. Soc. Nat. Science*, and of other local societies (articles by F. B. White, R. Smith, P. Macnair, etc.). See, too, "Scottish Mountain Botany,"

by Professor Bower, in *The Scottish Mountaineering Club Guide* Vol. I.

In *Trans. Linn. Soc.* vol. xxiii., Sir Joseph Hooker, "On the Distribution of Arctic Plants," gives the following list of sixty-one species which he mentions as "the most Arctic plants of general distribution that are found far north in all the Arctic areas." Their distribution as to the three areas under consideration is indicated here. × This signifies that it is in the British flora.

	Laoigh.	Lawers.	Clova.
Ranunculus nivalis	—	—	—
× *R. auricomus*	—	—	—
R. pygmaeus	—	—	—
Braya alpina	—	—	—
Cardamine bellidifolia	—	—	—
× *C. pratensis*	×	×	×
Draba alpina	—	—	—
D. androsacea	—	—	—
D. nirta	—	—	—
D. muricella	—	—	—
× *D. incana*	×	×	×
× *D. rupestris*	×	×	—
× *Cochlearia officinalis*	×	×	×
× *C. anglica*	—	—	—
× *Silene acaulis*	×	×	×
Lychnis apetala	—	—	—
× *Arenaria verna*	—	×	—
A. arctica	—	—	—
Stellaria longipes	—	—	—
× *Cerastium alpinum*	×	×	×
Potentilla nivea	—	—	—
P. frigida	—	—	—
× *Dryas octopetala*	×	—	×
Epilobium latifolium	—	—	—
× *Sedum Rhodiola*	×	×	×
× *Chrysosplenium alternifolium*	×	×	×
× *Saxifraga oppositifolia*	×	×	×
× *S. caespitosa*	—	—	—

	Laoigh.	Lawers.	Clova.
× *S. cernua*	—	×	—
× *S. rivularis*	—	×	×
× *S. nivalis*	×	×	×
× *S. stellaris*	×	×	×
S. flagellaris	—	—	—
× *S. Hirculus*	—	—	—
Antennaria alpina	—	—	—
× *Erigeron alpinum*	—	×	×
× *Taraxacum Dens-leonis*	×	×	×
Cassiopeia tetragona	—	—	—
Pedicularis hirsuta	—	—	—
P. sudetica	—	—	—
× *Oxyria reniformis*	×	×	×
× *Polygonum viviparum*	×	×	×
× *Empetrum nigrum*	×	×	×
× *Salix herbacea*	×	×	×
× *S. reticulata*	×	×	×
× *Luzula arcuata*	—	—	×
× *Juncus biglumis*	×	×	×
Carex fuliginosa	—	—	—
× *C. aquatilis*	—	—	×
Eriophorum capitatum	—	—	—
× *E. polystachion*	×	×	×
× *Alopecurus alpinus*	—	—	×
Deyeuxia Lapponica	—	—	—
× *Deschampsia caespitosa*	×	×	×
Phippsia algida	—	—	—
Colpodium latifolium	—	—	—
× *Poa flexuosa* (= *P. laxa*)	×	×	×
× *P. pratensis*	×	×	×
× *P. nemoralis*	×	×	×
× *Festuca ovina*	×	×	×
36	25	28	29

Hooker also gives a further list of twenty-two species which "are also inhabitants of all the five Arctic areas, but do not normally attain such high latitudes as the foregoing." (*Draba rupestris* is here omitted; it occurs in both lists.)

	Laoigh.	Lawers.	Clova.
Ranunculus lapponicus	—	—	—
× *Viola palustris* - -	×	×	×
× *Honkenya peploides* -	—	—	—
× *Epilobium angustifolium*	—	—	×
× *E. alpinum* - - - -	×	×	×
× *Hippurus vulgaris* -	—	—	—
Artemisia borealis - -	—	—	—
× *Vaccinium uliginosum*	×	×	×
× *V. Vitis-Idaea* - - -	×	×	×
× *Ledum palustre* - -	—	—	—
× *Pyrola rotundifolia* -	×	×	×
× *Polemonium coeruleum*	—	—	—
Pedicularis lapponica	—	—	—
× *Armeria vulgaris* - - (*Statice planifolia*)	×	×	×
× *Betula nana* - - -	—	—	×
× *Salix lanata* - - - -	—	—	—
× *S. glauca* (*S. lapponum*)	—	×	×
S. alpestris - - - -	—	—	—
× *Luzula campestris* -	×	×	×
× *Carex vesicaria* - -	×	×	×
× *Eriophorum vaginatum*	×	×	×
Atropis maritima - -	—	—	—
—	—	—	—
17	9	10	12

SUMMARY.

		Britain	Laoigh	Lawers	Clova
Hooker's 1st List	61	36	25	28	29
Hooker's 2nd List	22	17	9	10	12
Total - -	83	53	34	38	41

It is evident from the above that the flora varies from west to east along the outcrop. Not only does the number of arctic-alpines in-

crease towards the east, which would imply that the conditions are more boreal in that direction, but there is an interesting variation in the floras of these three areas.

Hooker's two lists do not include all the arctic-alpine species of our Scottish Highlands. Some, although they do not extend so far north, fall to be considered and a few of them will be dealt with in a similar manner.

	Laoigh.	Lawers.	Clova.
Thalictrum alpinum -	×	×	×
Aquilegia alpina - -	—	—	×
Trollius europaeus - -	×	×	×
Arabis petraea - - -	×	×	×
v. *grandifolia* Druce	×	—	—
Draba incana, v. *confusa*	×	×	×
Thlaspi alpestre - -	—	—	×
Lychnis alpina - -	—	—	×
Arenaria sedoides - -	×	×	×
A. rubella - - - - -	—	×	—
Sagina saginoides - -	×	×	×
Astragalus alpinus -	—	—	×
Oxytropis campestris -	—	—	×
Potentilla Crantzii -	×	×	×
P. Sibbaldi - - - -	×	×	×
Alchemilla alpina - -	×	×	×
Cornus suecica - - -	×	×	×
Linnaea borealis - -	—	Finlarig Wood.	×
Galium boreale - - -	×	×	×
Gnaphalium supinum	×	×	×
Saussurea alpina - -	×	×	×
Lactuca alpina - -	—	—	×
Pyrola secunda - -	×	×	×
Gentiana nivalis - -	—	×	×
Myosotis pyrenaica -	—	×	×
Veronica alpina - -	—	×	×
V. fruticans - - -	—	×	×
Bartsia alpina - -	×	—	—
Tofieldia palustris -	×	×	×
Juncus triglumis - -	×	×	×

	Laoigh.	Lawers.	Clova.
J. trifidus - - - - -	×	×	×
J. castaneus - - -	×	×	×
Luzula spicata - - -	×	×	×
Carex saxatilis - -	×	×	×
Kobresia bipartita -	×	—	—
Phleum alpinum - -	—	×	×
Woodsia alpina - -	×	×	×
Cystopteris montana -	×	×	×
Lycopodium annotinum	—	—	×
Selaginella selaginoides	×	×	×
	26	30	36

The above table proclaims the same facts as the previous tables, *viz.*, that the conditions in the east are more favourable to the growth of an arctic-alpine vegetation than they are on the west, and that there are interesting differences in the floras of the three areas. These two conditions will be discussed separately, for the former depends chiefly on the climatic and topographic factors whilst the latter depends mainly upon the edaphic factors.

But, before proceeding further with these discussions two or three items must be mentioned, though they have to be considered in their proper perspective.

Firstly, and to quote H. C. Watson, " Sheep and the dealers in specimens are fast destroying the scarcer alpine species."

Secondly, enthusiastic field-botanists and others have transferred species from area to area—and sometimes from remote areas. Professor J. H. Balfour planted seeds of *Phyllodoce coerulea* on the Sow of Athole, and he adds, in his description, that there may have been some seeds of *P. empetrifolium* amongst them. The native plant was at that time showing signs of being greatly reduced in numbers. Again J. Sadler planted *Eriophorum alpinum* in Glen Dole—but it no longer grows there. These are but two examples.

Perhaps, as a *Thirdly*, it might be added that in the rear of the retreating ice, it is quite possible that certain boreal species, *e.g.*, *Saxifraga cernua*, did not find a roothold on each of the three

areas under consideration. Further, it should be noted that the Clova area is more extensive than either Laoigh or Lawers. These are a few of the difficulties which confront the student of ecology in the Highlands of Scotland.

When the three lists of plants given above are considered, it is seen that several species are found on Lawers which do not grow on Laoigh, *e.g.*,

Arenaria rubella,
A. verna,
Saxifraga cernua,
S. rivularis,
Erigeron alpinum,
Gentiana nivalis,
Myosotis pyrenaica,
Veronica alpina,
V. fruticans,
Salix lapponum,
Phleum alpinum.

On the other hand, Lawers is without the following plants found on Laoigh:—

Arabis petraea, var. *grandifolia* Druce.
Dryas octopetala,
Bartsia alpina,
Kobresia bipartita.

There is an old record for *Dryas* on Lawers but its absence here may be due to the beauty of the species and the rapacity of dealers on Lawers, for the plant grows in Clova and is fairly widely distributed along the outcrop of the sericite, e.g., Cam Creag, Heasgarnich, Ben Vrackie, &c. When the geological formation of the two mountains is considered it is found that the Lawers-Caenlochan Schist forms the base of Laoigh, whereas it outcrops in the highest altitudes of Lawers. Thus, although both mountains are clad from base to summit with the usual arctic-alpine species the lower escarpments of Laoigh bear the rare plants of the sericite and the upper heights of Lawers are also rich in them; but because of the difference in altitude of the outcrops Lawers, as the lists show, possesses the more boreal plants.

Now, if the whole extent of the outcrop of the Lawers-Caenlochan Schist be reviewed from west to east, it is found that, apart from the topographical factor, the vegetation tends to become more boreal as the area is traversed. The following considerations will shew that this is mainly due to the climatic conditions. On the west the precipitation is much greater than it is on the east. The average annual rainfall for Beinn Laoigh exceeds 100 inches; on the east it is not half that amount. But the variations in temperature are more important. The original peneplane of the Scottish Highlands has not been dissected to the same extent on the east as it has been on the west. The Breadalbanes are more of the nature of isolated peaks. The panorama, viewed from the summit of Lawers, bears this out as do the names of the peaks in this region, —the term " Stob " being of very frequent occurence. Beinn Laoigh, for example, is a jagged, sphinx-like monument reared over the remains of at least half-a-dozen glaciers which departed existence in the corries which are now the glory of the Ben. Conditions are quite otherwise in the east. There the processes of subaerial denudation have not been so active, due, among other things no doubt, to the measure of precipitation and to the relations between the centres of distribution of the superincumbent ice. Thus it is that in the east the elevated tableland still exists with summits, mounds rather than peaks uprising from it. The larger corries seldom appear above the valley floors (*e.g.*, Caenlochan, Canness, Glen Fee, etc.). The glaciers were cut off in their infancy by the ameliorating climate which obtained during the waning of the ice-age. This extensive eastern mass of land reared above 2700 ft. would therefore be much colder than the isolated peaks of the west, fanned as they are by the prevailing south-west winds from the Atlantic which as they trend eastwards are more and more chilled and add to the lowering of the temperature in the region of Clova.

Thus, in addition to the more alpine plants found on Ben Lawers (as compared with Beinn Laoigh), Clova contributes :—

Lactuca alpina,
Luzula arcuata (needs confirmation).
Alopecurus alpinus,
Lycopodium annotinum.

Further, it is also a significant fact that *Arabis petraea*, var. *grandifolia* of Laoigh is not found to the east, but, where the calcareous schists outcrop in Ben More in Mull, this variety grows abundantly. *Bartsia alpina* and *Kobresia bipartita*, sparingly distributed throughout the western Breadalbanes, thin out towards the east. *Draba incana*, var. *confusa*, on the other hand, is rare on Laoigh but is the common form in Caenlochan. And again, as the Lawers-Caenlochan Schist is traced from west to east it is found that the arctic-alpines grow at lower altitudes, and that the higher altitudes of the east possess a more boreal vegetation.

But it is not due to climatic factors alone that variations exist along this outcrop. The edaphic factors also add their quota. In the Clova area, although it is more extensive than either of the other two under review, the geological formation reveals that the sericite has, associated with it, rocks which are not present in the Laoigh or Lawers areas. Intrusive granite is present, and is a favourite nidus for *Astragalus alpinus* and *Luzula arcuata*. The writer has not been fortunate enough to see *Oxytropis campestris* growing in its Clova fastness; but Professor J. H. Balfour records that the rocks on which it grows "appear in some respects to differ from those in the immediate neighbourhood." Again, *Lychnis alpina* glories on the wind-swept summit of Little Kilrannoch. What a lovely picture it presented in 1921, in fine condition, and in comparative abundance. (But arctic-alpine flowers all showed a wealth of bloom during the summer of that year. Even *Saxifraga cernua*, on Lawers, blossomed in profusion!) *Lychnis alpina* luxuriates on a soil formed from a decomposing serpentine rock, where it was found in association with *Statice planifolia*, *Cochlearia micacea*, *Deschampsia flexuosa* and *Festuca ovina*.

A few species of the Clova area still remain to be dealt with. It may have been expected that *Thlaspi alpestre* would have been treated in the preceding paragraph, seeing that it is a typical limestone plant; but the writer has been unable to find any record of it by Don as a plant of the Clova area. Had it existed there in his time it could hardly, from its present distribution, have missed his keen eye. It must, therefore, be considered as an introduced plant. *Aquilegia alpina*, observed by the writer on a few ledges at the head of Caenlochan, in 1921, cannot be regarded as otherwise. With

Epilobium angustifolium it seems to be different. It is found as a mountain species in the northern and eastern Highlands (not so *Thlaspi*), and unless there is any definite record of its introduction to Clova it falls to be reckoned as native. *Linnaea borealis* is not found on Laoigh, for Beinn Laoigh has no woodlands; and although not found on Ben Lawers, it is not far distant, being recorded from Finlarig Wood at Killin. In Clova, however, it is more plentiful.

When the different ecological factors are taken into account the transition from west to east is fairly gradual. This is specially evident between Laoigh and Lawers, and in the bens which extend to the north, where the sericite outcrops. It is a further cry from Lawers to Clova; but, in between, stands Ben Vrackie pointing either way. Scotland has no grander floral exhibit than this rich display of arctic-alpines which adorns the outcrop of the Lawers-Caenlochan Schist.

AN IMPORTANT QUESTION.

ERNEST ALMQUIST.

I intend to summon all friends of the flora to observe the wild allogams in Nature.

In Mendelian works we meet the opinion that a great many of the species must be hybridous, especially all allogams. We read, for instance, as follows: Whenever the impregnation is generally fulfilled by insects or the wind, it cannot exist in pure lines in Nature, because seldom or never identical and homozygous individuals copulate. Thus no constant species but only ephemeric forms are created. The Linnean species are "average types." Such assertions we often meet with in modern literature. It must be observed that they do not originate from direct observations on or experience of Nature. The Mendelists generally study by experiments and have not much time for Nature. It is true that groups and genera exist without constant species, for instance, Salices. But one claims the same for all allogams. I think every botanist and amateur of plants must

have some interest in how Nature really stands. It cannot be very difficult to investigate, whether, for instance, *Digitalis purpurea* in the woods of England produces bastards or not. It is probable that many wild allogams are suitable for observation, as *Verbascum Thapsus*, *Aquilegia vulgaris*, several species of *Papaver*, *Geum*, thistles, &c., &c. The observations must embrace great numbers. Bastards produced by impregnation from relatives growing hard by must be excluded. Of course it is our aim to look for species that produce bastards by their own nature.

Sowing is another way for clearing up the question. I have received plenty of plants from seed of wild *Digitalis*, all evidently the same year by year, with occasionally some sterile individuals. I have cultivated several of the other named species without being able to discover bastards. Perhaps, however, the numbers were too small or perhaps the germs of more delicate forms were not protected enough. My experience is not sufficient.

A third way is especially interesting. Probably we are able to follow Nature's work for transforming bastards into constant, homozygous forms and to fix the time for the transformation. I cultivate *Oenothera Lamarckiana* on a suitable ground. The forms grow abundantly without protection year after year. I suppose that the strain will gradually approach to constancy and that it will produce different species in different environments. I have commenced cultures of several other strains for the same purpose. If some experiments succeed we will at once possess evidence that Nature is able to transform bastards into homogenous, constant species.

Here I have given only my opinion on the practical methods for clearing up the question, but not the theoretical motives which I have treated of in another place.

THE HISTORY OF THE BOTANICAL SOCIETY AND EXCHANGE CLUB OF THE BRITISH ISLES.

By G. Claridge Druce.

Having now filled the office of Secretary for twenty years, perhaps I may be allowed to briefly refer to the progress of the Botanical Society and Exchange Club.

The Botanical Society of London was founded on July 27 1836, under the Presidency of Dr J. E. Gray, F.R.S., son of S. E. Gray, the author of "A Natural Arrangement of British Plants," published in 1821. The anniversary meeting was to be held on the birthday of John Ray, and its badge or crest was the *Victoria Regia*, a description and figure of which appeared in its first publication from the pen of its discoverer, Sir R. H. Schomburgk.

The Exchange Club Section was carried on by Mr H. C. Watson and Dr J. Boswell Syme, the author of the third edition of "English Botany." The expenses attendant on having rooms in London and a paid official were so great as to cause its dissolution about 1856. Its library and large herbaria were sold. Some of its members were, however, loathe to see the termination of its work, and the Exchange Club was carried on under the name of the Thirsk Natural History Botanical Exchange Club, Mr J. Gilbert Baker acting as distributor until 1866. In 1869 Mr Baker, whose residence at Thirsk had been destroyed by fire, removed to Kew, where he was put on the permanent staff of the Herbarium. The Distribution went on in London and the name was changed to the London Botanical Exchange Club. (The London Catalogue was prepared by Mr H. C. Watson mainly for its use.) This Distribution went on until 1869, when the name was again changed to 'The Botanical Exchange Club.' In 1879 Mr Charles Bailey became Secretary and the name was altered to 'The Botanical Exchange Club of the British Isles.' A fresh distributor was selected each year, the last, under Mr Bailey's management, being Mr J. Walter White in 1901. During all these years Mr Bailey acted in a most efficient and generous manner. The finance of the club was all wrong because the absurdly small subscription of 5s, even if paid, was of course insufficient to produce yearly reports and

an occasional desiderata list. Mr Bailey, however, cheerfully bore the loss which during his tenure of office amounted to between two and three hundred pounds. Owing to some reason, which I was never able to understand, some of the members started, or supported the formation of, another club on similar lines. This did not increase the number of members belonging to the senior club. There were urgent calls on Mr Bailey in other directions and he intimated his intention of resigning. Three courses were open (1) to allow the club to come to an end; (2) to merge with the other club; (3) to carry on with some fresh methods. Many members were unwilling that it should cease or merge with the other club, and I wasted much time and money to see if a bridge could not be found. One member of the junior club was obdurate, however, and so the scheme for union fell through. After Mr Bailey had circularised the members as to his resignation I was asked by a practically unanimous vote to manage its affairs. This wording was, advisedly, adopted as it conveyed something more than merely secretarial duties. As one of the members who pressed for this said, "We want you to direct and inspire the distributing duties and to work the scientific side of the club's sphere." Therefore in 1902 I acted as Distributor and took over the responsibility of the club's management. Mr Bailey handed me the sum of £7 10s to produce the next *Report*. We then had about 36 members on our books but the subscriptions, if paid at all, were paid most unpunctually, one or two members who also belonged to the other club being eight years in arrears. The pages of the Reports for the 24 years from 1879 to 1902 had a pagination of 718, averaging 36 a year, and the number of plants sent in for exchange amounted to about 88,000, an average of 3666 yearly. The names of the various distributors who have acted in the past 20 years are appended, from which it will be seen how representative they are of the best British botanists. In the last 20 years about 108,000 plants have been exchanged, an average of 5400, which, as will be seen, is a gratifying increase of about 50 per cent. The pagination of the Reports has increased to nearly 3400 pages, an average of 170. The increase has occurred chiefly in the last 12 years. The two last volumes have averaged nearly 300 pages annually, so that the increased subscription bears fruit.

Report.	Published. Distributor.	No. of Specimens. sent for Exchange.
	VOLUME II. pp. 508.	
1903-1904.	March—G. Claridge Druce ...	2209
1904-1905.	August—J. Groves, F.L.S. ...	3897
1905-1906.	April—J. Walter White, F.L.S. ...	4543
1906-1907.	April—Rev. W. R. Linton, M.A. ...	4556
1907-1908.	May—Rev. H. J. Riddelsdell, M.A...	4994
1908-1909.	September—William Bell	4195
1909 1910.	May—S. H. Bickham, F.L.S. ...	3906
1910-1911.	C. E. Moss, D.Sc.	4011
	VOLUME III. pp. 516.	
1911-1912.	Part i, April—Secretary	
	Part ii, June—J. A. Wheldon, F.L.S.	5346
1912-1913.	Part i, June—Secretary.	
	Part ii, August—John Cryer ...	8656
1913-1914.	Part i, February—Secretary.	
	Part ii, October—A Bruce Jackson, A.L.S.	8582
	VOLUME IV. pp. 653.	
1914-1915.	Part i, May—Secretary.	
	Part ii, November—R. H. Corstorphine, B.Sc.	6537
1915-1916.	Part i, April—Secretary.	
	Part ii, November—A. R. Horwood, F.L.S.	8153
1916-1917.	Part i, May—Secretary.	
	Part ii, June—W. H. Pearsall & D. Lumb	5453
	VOLUME V. pp. 849.	
1917-1918.	Part i, September—Secretary.	
	Part ii, October—C. E. Britton ...	6223
1918-1919.	Part i, July—Secretary.	
	Part ii, October—W. C. Barton, M.A.	5340

Report.	Published.	Distributor.	No. of Specimens sent for Exchange.
1919-1920.	Part i, October—	Secretary.	
	Part ii, October—	J. Walter White, F.L.S., & Miss I. M. Roper, F.L.S.	6257
	VOLUME VI. pp. 866.		
1920-1921.	Part i, September—	Secretary.	
	Part ii, September—	G. C. Brown...	4837
1921-1922.	Part i, September—	Secretary.	
	Part ii, September—	Miss E. N. Thomas, D.Sc., Miss Vachell, F.L.S., and Mr A. E. Wade ...	4836
1922-1923.	Part i—	Secretary.	
	Part ii,	L. V. Lester-Garland, F.L.S.	4903

The membership roll has increased from 28 to about 500. One need scarcely say that the amount of work which falls upon the Secretary has much increased, not only so far as clerical duties are concerned, but in the preparation of the Annual Report. This is no light task. In addition there is the identification of the plants which are sent. Last year many thousands passed through his hands. Members could reduce the merely routine work very much by being careful to send in a tin box fresh specimens each with an attached label (tied on with a cotton thread) bearing the suggested name, the habitat and any note of interest. When dried specimens are sent they should be fastened with a strip or two of gummed paper to a sheet of newspaper and the accompanying label with particulars may be pinned to that. Loose labels and plants are an abomination. Gummed labels become unfastened from fresh specimens and postage stamps—such is the perversity of things—always get stuck together. Therefore the accompanying note and addressed label with stamps should be tied outside the tin and the tin itself wrapped in paper. The return postage (in the interest of the Society) must always be sent.

I have to very warmly thank the Distributors, the Critics, both British and Foreign—of the latter notably Dr Albert Thellung—the various writers of articles and communicators of specimens, those who have assisted in proof-reading—notably Dr Vines and Mr

and Mrs Corstorphine, and the Publishers for their generous aid: also those who have kindly helped in Benevolent matters. Especially am I grateful for the very loyal support and continued kindness of the members. One cannot hope indefinitely to bear the burden which such an organisation entails. I have, however, the greatest pleasure in doing what little I am able to, in assisting my fellow workers, and to promote the study of field Botany. It will be a pleasure to continue the duties so long as I have the approval and support of the members. Any suggestions for improving our methods are always welcomed.

In answer to the request of several members I have ventured to insert a portrait of myself to mark the prolonged tenure of the office.

VARIOUS NOTES.

ORCHID SEEDS GERMINATED ON SUGAR MEDIUM. Nearly 100 per cent. of the seeds germinated when sown on a sugar-agar in tubes. Prof. Kingdon, of Cornell University, was led to think that the seeds are not so dependent on certain fungi as upon the nourishment which these fungi afford.

CRYPTOMERIA JAPONICA. The wonderful avenue of these trees, which lead to Nikko in Japan, was planted between 1631 and 1651. It stretches for 24 miles and there remain 18,308 trees. At the building of the temples—the burial place of the Jeyasu—his successor ordered the Daimios of the Empire to send each a stone or bronze lantern to decorate the ground about the mortuary temple. All complied with the order but one man, Malsudaira Masalsuma, who, too poor to send a lantern, offered to plant trees by the wayside that visitors to the temple might be shaded from the heat of the sun. This magnificent avenue is now one of the wonder-sights of Japan. See Bulletin of Popular Information, Arnold Arboretum.

We are delighted to see the honour conferred on our member, Mr J. Fraser, of Kew—that of V.M.H., the Victoria Medal of Honour in Horticulture. This he has undoubtedly earned. Mr Fraser is not only a distinguished horticulturist but he is an able and critical botanist, who has an excellent knowledge of Britain and British plants. Mr Fraser assisted the late Lord Avebury in the production of the "Contribution to our Knowledge of Seedlings and Buds and Stipules," and he remained with him as botanical assistant up to 1912.

Dr Otto Stapf, who for thirty years has been associated with Kew, and for fourteen years was Keeper of the Herbarium, in which office he did signal work, has retired. He is succeeded by Mr Arthur Disbrowe Cotton, who has held an important post under the Board of Agriculture in the Department of Plant Pathology at Rothamsted.

Major Chipp, B.Sc., M.C., has been appointed Assistant Director at Kew.

Dr Otto Buchtien, formerly Director of the Museo Nacionel, La Paz, Bolivia, has died. His herbarium consisting, says the *Gardeners' Chronicle*, of about 4500 specimens, has been acquired by the United States National Museum.

George Forrest's collection of Chinese plants, 8000 in number, has been presented to Kew.

Prof. J. H. Trail, F.R.S. A memorial, consisting of a plaque portrait, is to be placed in the Botany Department of Aberdeen University, with which he was associated for nearly forty years. It is hoped also to issue a memorial volume in which will be published the Flora of the City Parish of Aberdeen. This had been prepared by Prof. Trail. The volume will contain much interesting autobiographical material and a complete bibliography of his publications.

The *Journal of Indian Botany* has now been taken over by the Indian Botanical Society. Prof. P. F. Fyson is to be the Editor. He started the Journal as a private venture.

We are glad to notice that once again the *Botanical Magazine* has been resumed. Under the able editorship of Dr Otto Stapf we trust it will have the circulation it deserves. This year also witnesses the publication of a new edition of Babington's Manual by Mr A. J. Wilmott, and a Guide to the Botanical Gardens at Cambridge by the Director.

FLOWERING PLANTS OF SOUTH AFRICA. Vol. 2, 1922. A new genus, ROADIA, closely allied to the *Mesembryanthemum*, is established by Mr N. E. Brown. There are many other new plants described.

NEW SPECIES FROM MOUNT EVEREST. *Aconitum orochryseum* Stapf at 15,000 feet, Wollaston. *Androsace sessiliflora* Turrill, at 17,000 feet, on Chamolhari, about 130 miles from Everest. *Dracocephalum breviflorum* Turrill, at 13,000 feet, Wollaston.

BOX HILL, SURREY. This beautiful and interesting area which now belongs to the National Trust has, through the generosity of Miss Warburg, been supplemented by 70 additional acres, which she purchased from the trustees of Lord Frederick Hope. In the area are Beech and Larch Woods and a Round Tower. Heaven forfend it from the enthusiast who might like to plant it with alpines and rhododendrons.

WILLIAM A. L. WATSON, V.M.H., has retired from the Curatorship of the Royal Gardens, Kew, and has been succeeded by an extremely efficient horticulturist, Mr W. J. Bean, V.M.H., the author of an excellent work, "Trees and Shrubs Hardy in the British Isles." Mr Watson succeeded my old friend, Mr George Nicholson, the author of the "Illustrated Dictionary of Gardening." In Mr Watson he had a very worthy successor. Sir Joseph Hooker dedicated the 130th volume of the Botanical Magazine to Watson as "my sense of the value of the service which you have rendered to this work."

During the year 1921 Kew Gardens were visited by 3,236,308 people, a very substantial increase over the preceding year. They have now been open for 81 years, the opening day being April 1, 1841. 20,000 entered the gates on the August Bank Holiday.

We congratulate our member, Mr Spencer Bickham, on the beautiful *Dianthus* which is connected with his name. It makes a most attractive rock-garden plant.

THE BRITISH BRYOLOGICAL SOCIETY. We are greatly pleased to see that this Society has been formed. The well known cryptogamic botanist, Mr D. Jones, M.Sc., Rock Cottage, Harlech, is the Hon. General Secretary; Mr H. N. Dixon, President; Mr W. H. Pearson, vice-President, and the distributors, Mr F. Rilstone, for the Mosses, and Mr A. Wilson for the Hepatics. The Treasurers are Mr J. A. Wheldon and the Rev. R. Jackett, and the Secretary, Miss Eleonora Armitage. The two sections of the Moss Exchange Club are now merged in this Society and an Annual Meeting is to be held. The Subscription is only 5s. Under such a splendid set of officers the Society should be a great success. Members wishing to join should apply to the General Secretary.

LINKS WITH THE PAST.—My great-grandfather, Philip Miller, compiler of the "Gardeners' Dictionary," was born 1691, and died in 1771. My grandfather, Charles Miller, was curator of the Cambridge University Botanical Gardens, and then Governor of Bencoolen and Fort Marlborough, Sumatra, and was born in 1739, died 1817. My mother, Mary Amelia Miller, was born in 1800, married Edward Layton in 1821, and died 1873. I am their younger son, and am now 79. So that since my great-grandfather's birth and the present year there is a period of 231 years, which, with four lives, makes an average of 57.3 years to a generation.—REV. W. E. LAYTON, in *The Times*.

FLORAL CLOCKS must always be rather curiosities and playthings than things of practical usefulness, for all flowers vary more or less in their times of opening and closing. It is, indeed, possible anywhere in the country to arrive approximately at the time of day by the observation of flowers, as many of our old plant names testify, and the idea of floral clocks is an old one. Everybody knows Marvell's verses:—

> "How well the skilful gard'ner drew
> Of flowers and herbs this dial new! . . . .
> How could such sweet and wholesome hours
> Be reckon'd, but with herbs and flowers!"

Charlotte Smith's "Flora's Horologe" is less familiar, but is interesting because it gives the names of most of the flowers that form the clock. The *Nymphæa* (white water lily) tells both the hour of dawn and that of the sunset; the daisy, the Star of Bethlehem, "the humble *Arenaria*—a "bastard name," says Gerard, for bucks' horn —"the Hieraciums' various tribe," Succory, *Silene* (*noctiflora*), and, of course, the Goats'-beard, or Go-to-bed-at-noon, all play their parts. A more charming clock than hers, however, is that of Siebenkäs, in Jean Paul's romance, "Flower, Fruit and Thorn Pieces," all particulars of which I forget. Richter seems to have the same idea in mind when describing the Lilac garden in his later romance, "Titan." Friend has a long list of flowers that might be used as items in such a time-piece—the Marvel of Peru, or Four o'clock (*Mirabilis*), *Ornithogalum*, or Seven o'clock Lady, the Venice Mallow, or Good-night-at-noon, of which, however, Gerard says that it should be called "Good-night-at-nine," and others. The following selection of plants is claimed ("Scientific American") to be the most perfect list for the floral clock up to date. Slight variations in the times of opening might occur in different localities, but it is remarkable how closely the various plants adhere to the times of opening. The times of the expanding of the buds are in all cases put before the name of the plant: 6 a.m., yellow hawkweed (*Hieracium aurantiacum*); 7 a.m., marigold (*Calendula pluvialis*); 8 a.m., Venus looking-glass (*Specularia Speculum*); 9 a.m., corn marigold (*Calendula arvensis*); 10 a.m., clovewort; 11 a.m., mountain dandelion (*Taraxacum montanum*); 12 noon, fig marigold (*Mesembryanthemum*); 1 p.m., single pinks (*Dianthus*); 2 p.m., *Pyrethrum corymbosum*; 3 p.m., red hawkweed; 4 p.m., lady of the night (*Mirabilis dichotoma*); 5 p.m., catchfly (*Silene noctiflora*).—*Chemist & Druggist*, 1922.

Clearing Swimming Pond of Growth: (Bowers—118/5).—Where there is much fully-developed growth on the surface of the water, it is advisable to draw as much as possible of it out of the water by means of a rake before applying the radical remedy. Copper sulphate is now commonly used, and it has been found that a proportion of one part of the salt to three million parts of water is harmless to fish and does not render the water dangerous to human life. The

usual method of applying the copper sulphate is to drag the crystals in a canvas bag through the water at the stern of a boat, but an improvement on that method is to scatter the crushed or roughly-powdered sulphate over the surface of the water, just as one sows seed. Used in this proportion, it is stated that no trace of copper remains in the water at the end of a week. The application of brine would not, we think, have any perceptible effect.—*Pharm. Journ.*

Among the Sales of Books in 1922 may be mentioned that of the Cassiobury Library, where Redouté's Les Liliacées fetched £100.

" If a man can make a better book, preach a better sermon, or make a better mouse-trap than his neighbour, though he build his house in the woods, the world will make a beaten track to his door." —EMERSON.

PERSONAL NOTES.

Mrs ISABEL ADAMS, F.L.S., is painting British Aquatics. Members wishing to help in collecting specimens are asked to communicate with her at 14 Vernon Road, Edgbaston.

Mrs PERRIN, 23 Holland Villas Road, London, W. 14, is continuing her beautiful paintings of British Plants. Members willing to assist in collecting specimens are asked to write to the above address.

Mr T. A. DYMES, F.L.S., Carthona, West Drayton, Middlesex, wants ripe capsules of British Orchids, especially *Malaxis*, *Herminium*, *Cephalanthera*, *Spiranthes*, &c.

W. NORWOOD CHEESMAN, Esq., The Crescent, Selby, York, will be glad to receive or exchange specimens of *Mycetozoa*.

F. J. HANBURY, Esq., Brockhurst, East Grinstead, is anxious to have seeds of rare British plants. He will defray expenses.

Mr A. E. WADE, Botanical Department, the University of Cardiff, is contemplating the preparation of a Flora of Monmouthshire, and would be glad of assistance.

CORRECTIONS AND ADDITIONS, 1920 & 1921 REPORTS.

Report 1920.

p. 6. Line 12. For " Melville " read " Melvill."

p. 10. Line 29. For " Norfolk " read " Suffolk."

p. 27. Line 16. Under LAGOSERIS add " See *Rep. B.E.C.* iv., 419."

p. 33. Line 12. *Solanum nigrum* L., var. *sinuatum*. This is previously described as var. *atriplicifolium*.

Line 34. LINARIA RETICULATA Desv. is more correctly L. PINIFOLIA (Poir.) Thell. in Fedde Rep. Sp. Nov. 291, 1912.

p. 35. Line 17. Under VERONICA ORIENTALIS add " See also *Rep. B.E.C.* v., 571."

p. 82. Line 22. For " latter " read " former."

p. 85. Line 22. For " *viridescens* " read " *virescens*."

p. 95. Line 22. For " 1862 " read " 1858."

Line 29. For " which " read " that for 1862."

p. 109. Line 26. For " Park " read " Herts."

p. 124. Line 25. For " Syredale " read " Syradale."

p. 128. Line 10. For " Beaguoy " read " Beauquoy."

p. 139. Line 7. For " Syredale " read " Syradale."

p. 155. Lines 3 and 28. For "Darkadale" read "Durkadale."

p. 158. Lines 13 and 21. For " Glasgow " read " Leith."

p. 221. Line 26. Add " not *macrophylloides* but a *hirtifolius* form."

p. 222. Line 12. *R. Borreri* (Four Shire Stone) is wrong. The plant, a single bush, looks very near *sertiflorus*, but can hardly be that. I cannot give it a certain name at present. Its place seems to be among the

Radulae or *Sub-Koehleriani* of Rogers.—H. J. RIDDELSDELL.

p. 251. Line 6. For "August" read "July."

p. 254. Line 9. For "Darkadale" read "Durkadale."

Report 1921.

p. 266. Line 18. For "minute" read "rare."

p. 275. Line 17. Add after Edinburgh "where it was sown in 1822."

p. 283. Line 15. Add "See *Rep. B.E.C.* iv., 198."

p. 293. Line 7. For "*pulmonarium*" read "*pulmonarioides.*"

p. 308. Line 22. Delete "var. *leptochila.*"

Line 25. For "it" read "*leptochila.*"

p. 318. Line 28. For "var." read "×."

p. 371. Line 10. For "*dicipiens*" read "*decipiens.*"

p. 401. Line 16. For "Hants" read "Surrey."

p. 457. Line 14. For "Sullum" read "Sullom."

Line 23. For "Voe" read "Hill."

p. 461. Line 21. For "*palustris*" read "*pratensis.*"

p. 469. Line 13. For "Bunya" read "Burga."

p. 480. Line 10. For "Surima" read "Swima."

p. 485. Line 14. For "Hamar" read "Kamar."

p. 497. Line 17. For "Brechin" read "Breakon."

p. 320. Line 27. For "S." read "SPOROBOLUS."

p. 358. Line 14. Add "See *Journ Bot.*"

p. 374. Line 23. Add "Mrs Gregory now refers this to V. RIVINIANA × RUPESTRIS.

p. 381. Line 19. Add "Further specimens show that this Rose is not one of the *aciculatae.*"

p. 386. Line 19. "Shalford, S. Hants, Miss TODD" belongs to C. BIENNIS and the locality is Shedfield.

p. 397. Line 16. For "*macrocarpa*" read "*microcarpa.*"

p. 547. Line 1. For "1920" read "1921."

p. 552. Line 5. For "*R. alba* L." read "*R. lutea* L."

Lines 18 and 19. For "*Pesnaui*" read "*Pesneaui.*"

Lines 20 and 25. For "Shell-scully Links" read "shell-sandy links."

p. 555. Line 35. *R. pubescens*, var. *subinermis* (Wimbledon Common). There is certainly some *macrophyllus* in this distribution. The whole had better be destroyed, unless members can make the correction for themselves. I do not know how the mixture occurred. Both plants grow on Wimbledon Common.—H. J. RIDDELSDELL.

p. 558. Line 35. The entry should read *R. Godroni* (not *argenteus*), var. *robustus*.—H. J. RIDDELSDELL.

p. 574. Line 10. For "Orkney" read "Shetland."